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Chance to Win a
CLUB MED VACATION

PUBLISHED BY SCHOLASTIC INC.

FEBRUARY 1985

VOLUME 3
NUMBER 2

FAMILY COMPUTING

A Step-by-Step Guide to Computer Care

Alternatives to
the Keyboard:
Buyer's Guide to
Touch Tablets, Light Pens,
Software, and More

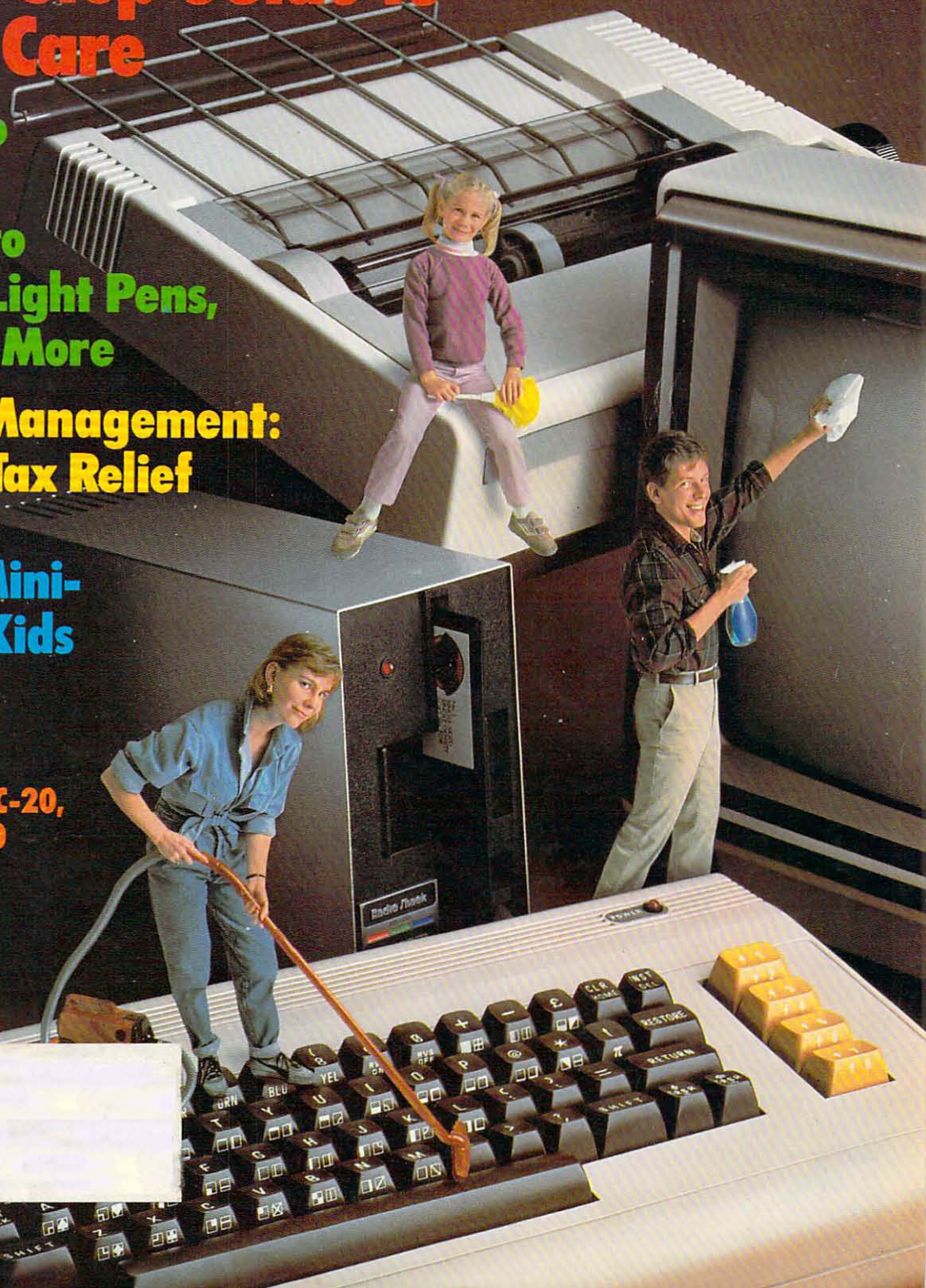
Home/Money Management:
Computerized Tax Relief

Including:

**K-POWER, A Mini-
Magazine for Kids**

Inside:

Original Programs for
ADAM, Apple, Atari,
Commodore 64 and VIC-20,
IBM, TI, Timex, TRS-80



DESIGNWARE GROWS WITH YOUR CHILD

Kids may grow out of their clothes every few months, but that doesn't have to happen with the software you buy. Now DesignWare offers eleven family learning games that actually *grow with your child*, as your child's own skills grow and develop.

CHILDREN COME IN ALL SHAPES AND SIZES. SO DO THEIR LEARNING NEEDS.

All DesignWare programs provide multiple skill levels. In addition, most of our programs are easily customized to supplement current school assignments—you can add your own school work, word lists, or additional, more difficult problems to be solved.

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DESIGNWARE HELPS BUILD STRONG MINDS 4 WAYS.

1) *Valuable learning experiences—not just drills.* Many so-called educational programs are no more than computerized flash cards. DesignWare programs use motivating, interactive instruction techniques—proven teaching methods that learners of all ages thrive on.

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3) *DesignWare teaches what has to be taught*—algebra, geometry, geography, spelling,

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4) *Put the real power of your computer to work.* DesignWare programs make full use of the capabilities of today's home computers. They're quick and responsive—providing immediate feedback and reinforcement. Built-in demonstrations and liberal use of graphics, sound and *on-screen help* make them fast, easy and fun—even the first time you use them.

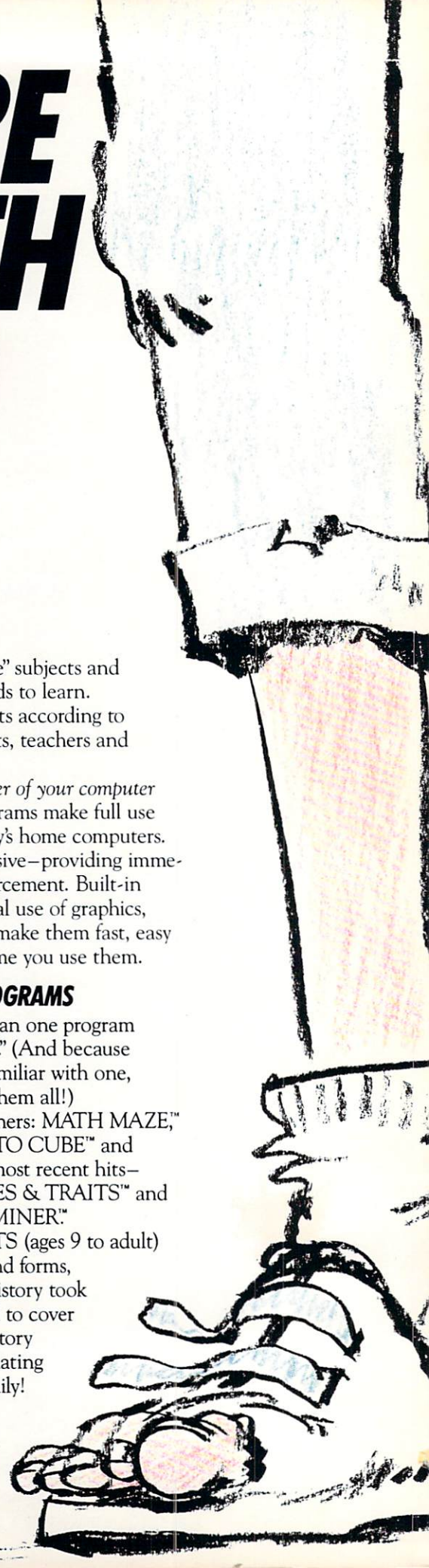
AWARD-WINNING PROGRAMS

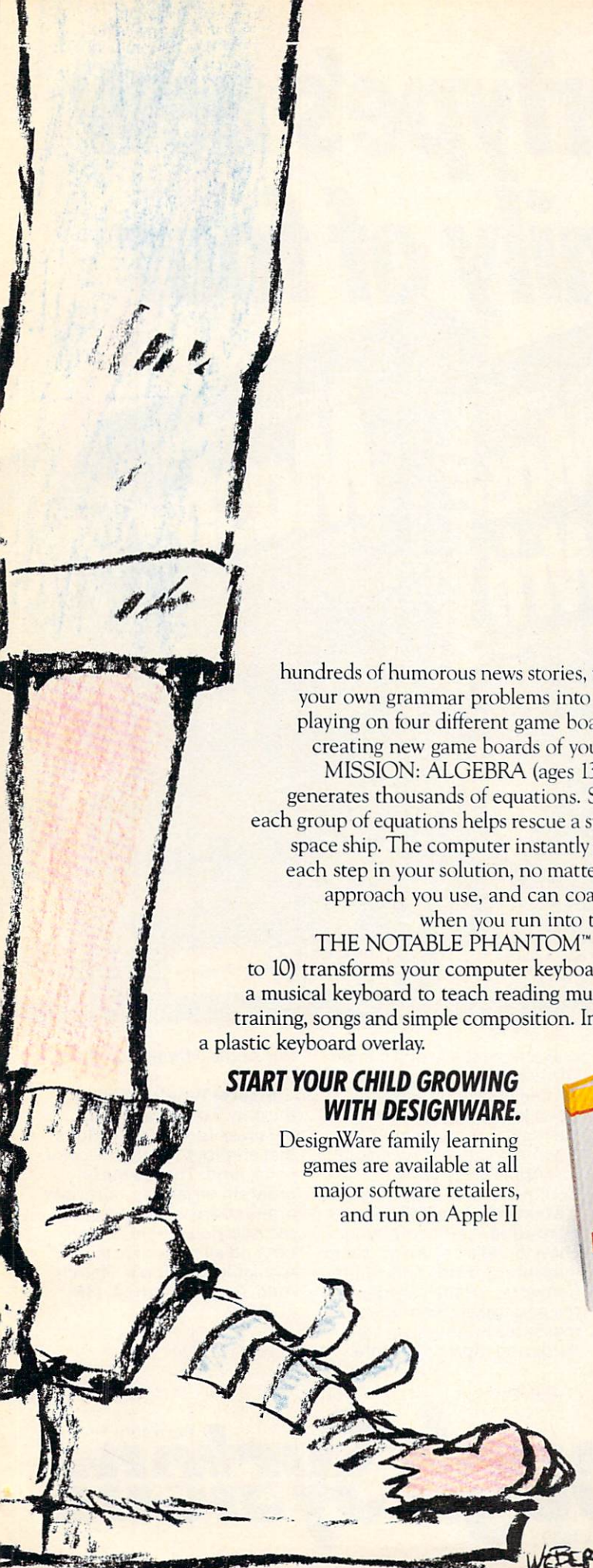
You'll want to try more than one program in the DesignWare “family.” (And because they're a family, getting familiar with one, makes you familiar with them all!)

Try our award winners: MATH MAZE™, SPELLAGRAPHS™, CRYPTO CUBE™ and TRAP-A-ZOID™. Or our most recent hits—SPELLICOPTER™, STATES & TRAITS™ and THE GRAMMAR EXAMINER™.

STATES & TRAITS (ages 9 to adult) covers U.S. geography, land forms, related trivia and *where* history took place. It can be expanded to cover current studies, family history and other topics—a stimulating learning game for the family!

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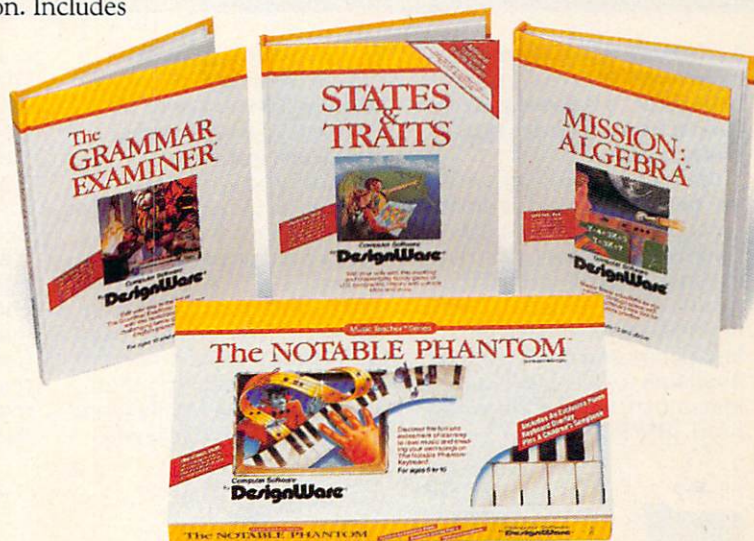
START YOUR CHILD GROWING WITH DESIGNWARE.

DesignWare family learning games are available at all major software retailers, and run on Apple II

family, IBM PC, PCjr, Commodore 64, Atari and other popular microcomputers with disk drives. We provide a 90-day warranty against defects and free telephone support.

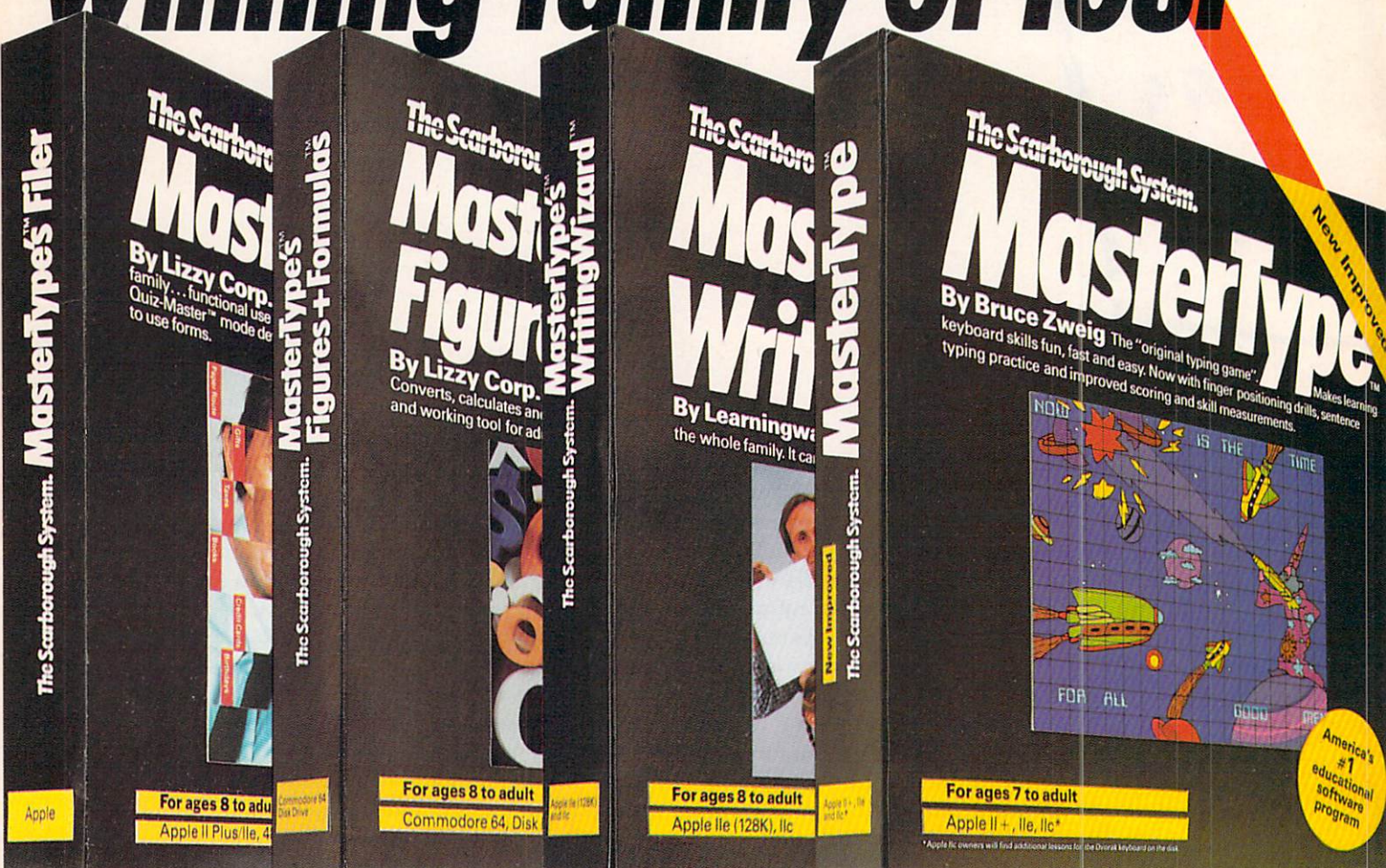
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You'll grow with us.

FAMILY COMPUTING

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Last Chance to Win a Club Med Vacation!

Check out the FAMILY COMPUTING "Computing Family of the Year" Contest. Your family could win an exotic getaway. See details on page 75.

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Why every kid should ha

Today, there are more Apples in schools than any other computer.

Unfortunately, there are still more kids in schools than Apples.

So innocent youngsters (like your own) may have to fend off packs of bullies to get some time on a computer.

Which is why it makes good sense to buy them an Apple® IIc Personal Computer of their very own.

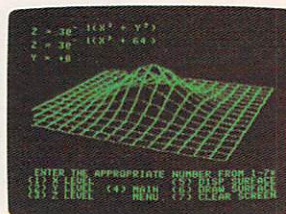
The IIc is just like the leading computer in education, the Apple IIe. Only smaller. About the size of a three-ring notebook, to be exact.

Even the price of the IIc is small — under \$1100.*

Of course, since the IIc is the legitimate offspring of the IIe, it can access the world's largest library of educational software. Everything from Stickybear Shapes™

programs in all. More than a few of which you might be interested in yourself.

For example, 3-in-1 integrated business software. Home accounting and tax



With a IIc, your kid can do something constructive after school. Like learn to write stories. Or learn to fly. Or even learn something slightly more advanced. Like multivariable calculus.

for preschoolers to SAT test preparation programs for college hopefuls.

In fact, the IIc can run over 10,000

programs. Diet and fitness programs.

Not to mention fun programs for the whole family. Like "Genetic Mapping" and



ve an Apple after school.

"Enzyme Kinetics."

And the Apple IIc comes complete with everything you need to start computing in one box.

Including a free 4-diskette course to teach you how—when your kids get tired of your questions.

An RF modulator that can turn almost any TV into a monitor.

As well as a long list of built-in features that would add about \$800 to the cost of a smaller-minded computer.

128K of internal memory—twice

the power of the average office computer.

A built-in disk drive that would drive up the price of a less-senior machine.

And built-in electronics for adding accessories like a printer, a modem, an AppleMouse or an extra disk drive when the time comes.

So while your children's shoe sizes and appetites continue to grow at an

alarming rate, there's one thing you know can keep up with them. Their Apple IIc.

To learn more about it, visit any authorized Apple dealer. Or talk to your own computer experts.

As soon



as they get home from school.



In its optional carrying case, the IIc can even run away from home.

*The FTC is concerned about price-fixing. So this is only a Suggested Retail Price. You can pay more if you really want to. © 1984 Apple Computer Inc. Apple and the Apple logo are registered trademarks of Apple Computer Inc. Stickybear Shapes is a trademark of Optimum Resource. For an authorized Apple dealer nearest you call (800) 538-9696. In Canada, call (800) 268-7796 or (800) 268-7637.

EDITOR'S NOTE

I LIKE COMPUTERS— AND I'M NOT ASHAMED TO SAY IT

It's not always easy for me to express good feelings. And it's sure not easy to accept them. Either way, I usually end up feeling sappy.

Well, since this issue says February, the month when sappiness is officially endorsed, it's now or never as far as getting out good feelings.

While 1984 was full of surprises in the field of home computing, including some disappointments, it also took a number of good turns that deserve special attention.

Topping our list is the fact that Jack is back. That's Jack Tramiel, founder of Commodore and new head of Atari. In a rare private interview with Tramiel at Atari headquarters in Sunnyvale, California (in the heart of Silicon Valley, of course), Features Editor Nick Sullivan and I got a taste of why Tramiel gets so much attention. Nick has documented our interview in "Jack Is Back" (p. 54). We salute Tramiel for his perseverance, for keeping his eye on the basics of this business, for his declared faith in the end-buyer's intelligence, and for his unflagging energy. We should be getting a view of some of the new computers Tramiel's got up his sleeve just as this issue comes off the press.

Valentines too, to IBM, for acknowledging its mistakes with the original PCjr, for issuing the new, superior keyboard, and for responding to the home market.

Apple's valentines are for its continued innovation, its imaginative marketing which has brought increased sales, and for its official entry into the home with the IIc.

Tandy gets our valentine for its experiments in marketing to the home, by actually going there with an innovative in-home selling program, and for continued good engineering and reliability, most recently exhibited in the much-heralded Tandy 1000.

Commodore deserves a valentine for improving the ever-popular C 64,



which holds a strong lead in the home market.

To all the software companies that are steadily improving the products they're delivering, especially those related to education, we send special valentine greetings. We congratulate them, too, for lowering software prices for the home market. Price cuts are much appreciated by home users, for whom choosing to buy software means not being able to spend money for something else.

Valentines to everyone keeping prices down on all products for the home market. We can't emphasize enough how much good value means to the consumer.

And, of course, we don't want to forget our cover story—"A Step-By-Step Guide to Caring for Your Computer." A little literal in the "caring" department perhaps, but basic to maintaining a good "electronic relationship." (see page 39).

And there are all those mushy things I love to tell you, dear readers, that embarrass even me. Just keep your wonderful letters coming—they're the first things we open when the mail arrives.

Happy (computerized) Valentine's Day!

Claudia Cohl

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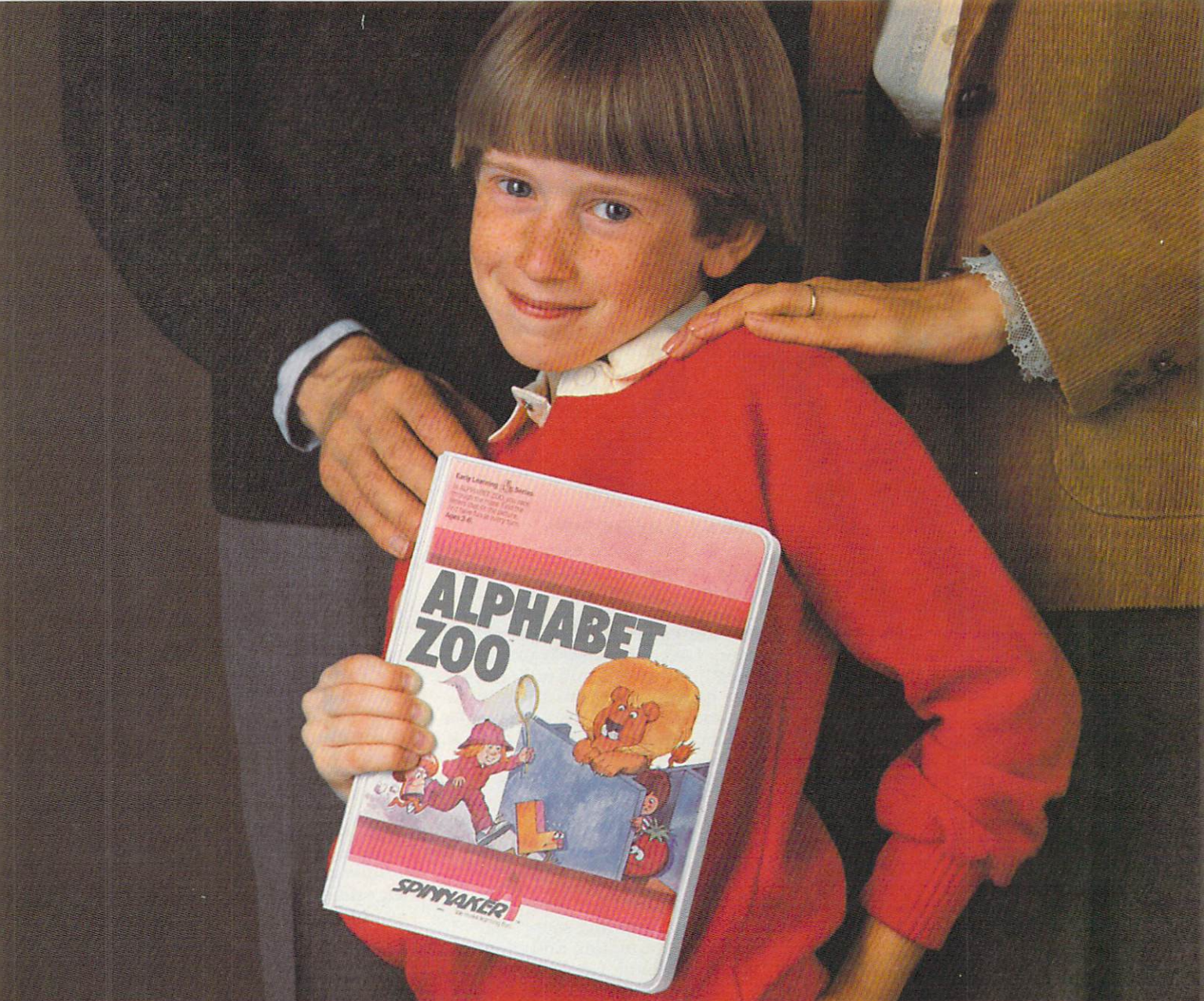
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Finally, computer games you want your kids to play.

Spinnaker makes computer games kids love to play. But some of our biggest fans are parents.

Because on top of all the fun and excitement, our games have something more. True educational value. They help develop a child's learning skills, in all kinds of fun ways.

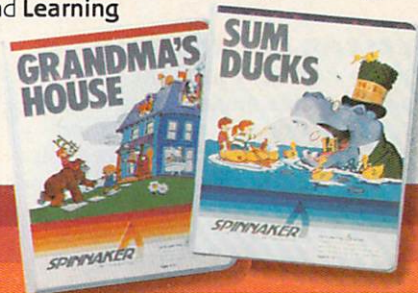
So Spinnaker games aren't just computer games. They're Learning Games.

They're written by top educators who know how to make learning fun. And by expert game programmers, who use colorful graphics, animation and sound to make our games so exciting, your kids may not even realize they're learning. They're having too good a time!

That's why children love us. And parents love us. And why we're already the leader in the field of home educational software.

So if you're looking for computer games that you'll like as much as your kids will, look for Spinnaker **Early Learning Games** (ages 3-8) and **Learning Discovery Games** (ages 6-12) at your local retailer.

Spinnaker. We're giving computer games a good name.



SPINNAKER
We make learning fun.™

Disks for: Apple® Atari® IBM® PC and PCjr and Commodore 64.™

Cartridges for: ColecoVision®, Coleco Adam,™ Atari®, IBM® PCjr and Commodore 64.™

LETTERS

10 REM GOOD ADVICE

I have used a computer in my business for more than eight years and have owned a personal computer for about two years. Almost everything I know about computers, including elementary programming, I have learned from books and from typing in published programs.

In your magazine, you usually have several programs written by the staff or readers. These programs are usually interesting and useful, but most are not well-documented. By this, I mean there are not many "REM statements" or variable definitions. Yes, we can type in the programs, but they are difficult to understand.

Everything I have read about programming states that an abundance of "REM statements" makes following a program easier. If this could be done in the future, not only will people find it easier to follow these programs, but they will learn programming faster by using your examples.

J. YALE HECHTMAN

W. Bloomfield, Michigan

EDITOR'S NOTE: *You're absolutely right. Programs are more easily understood when "REM statements," or "remarks" are included. We design most of our programs with REM statements in place. Unfortunately, sometimes we have to delete them in order to fit another version of the program on the page. We'll continue to try to insert REMs when space permits.*

A CLEAR-CUT COMPLIMENT

I must say that I have the utmost respect for your magazine and value it over others on the market. Your clear-cut, concise articles are a pleasure to read. Keep up the good work on your fine magazine.

JOHN HOLBROOK

Stevensville, Michigan

SOME HELP FOR COMMODORE USERS

I had many problems with the original Commodore 1541 Disk Drive Manual. I suggest that anyone with similar problems send off for the

1541 User's Manual Errata, a nine-page manual that really filled the gaps left in the original. The manual is free from Commodore's Computer Systems Division, Attention: Customer Support, 1200 Wilson Drive, West Chester, PA 19380.

JOHN NALLEY

Gulfport, Mississippi

"WHAT ABOUT TI?"

I am the very proud owner of a TI-99/4A computer. I work with large computers for a living. But I enjoy home computing, though I do not have a large amount of money to spend. I keep my checkbook balanced. I file names and addresses. I write games for my two children to play and learn, and use an awful lot of other applications which make my life easier.

This is a short profile of the many thousands of us TI owners. We are very happy with our choice of home computers. Why have all the software/hardware manufacturers forgotten us?

Every month, I buy several computer magazines and scour the pages for information and programs for the TI. Thank God for the few magazines like FAMILY COMPUTING. But look at the software ads. They say, "Available for the IBM PC, Apple family, and Commodore computers." What about TI?! Just because the computer is not being made anymore, is that any reason to neglect us?

My advice to the software/hardware manufacturers is to look at this large untapped market. Not only will you be making the thousands of TI users extremely happy, but wait until you see that earnings graph on your PC jump up a few points.

JIM KLOCEK

Downers Grove, Illinois

EDITOR'S NOTE: *Unfortunately, there's no denying that many manufacturers abandoned the development of TI software when the production of the computer came to a halt. Many of these manufacturers, rightfully or wrongfully, believed it was better to turn their attention to the growing computer markets (such as Apple, IBM, and Commodore) rather than*

to stick with TI—a market that would certainly never expand beyond its current number of users. The manufacturers believed that their profit margins would shrink as TI users gradually moved on to second or third computers. What most manufacturers didn't foresee was the strong loyalty the TI users continue to have to their machines. We think your advice to manufacturers is sound.

A PRINTER PROBLEM

I recently purchased a Commodore MPS-801 printer for my Commodore 64. The only problem with it is that the lowercase letters "g," "j," "p," "q," and "y" do not go below the line like they should. I would like to know if there is a way this can be fixed.

ED TAYLOR

Cudahy, California

EDITOR'S NOTE: *Unfortunately, there is no way for you to alter your printer to make it print descenders. Our advice, although a little late for you, is to try out all hardware before you purchase it so you know what you're getting.*

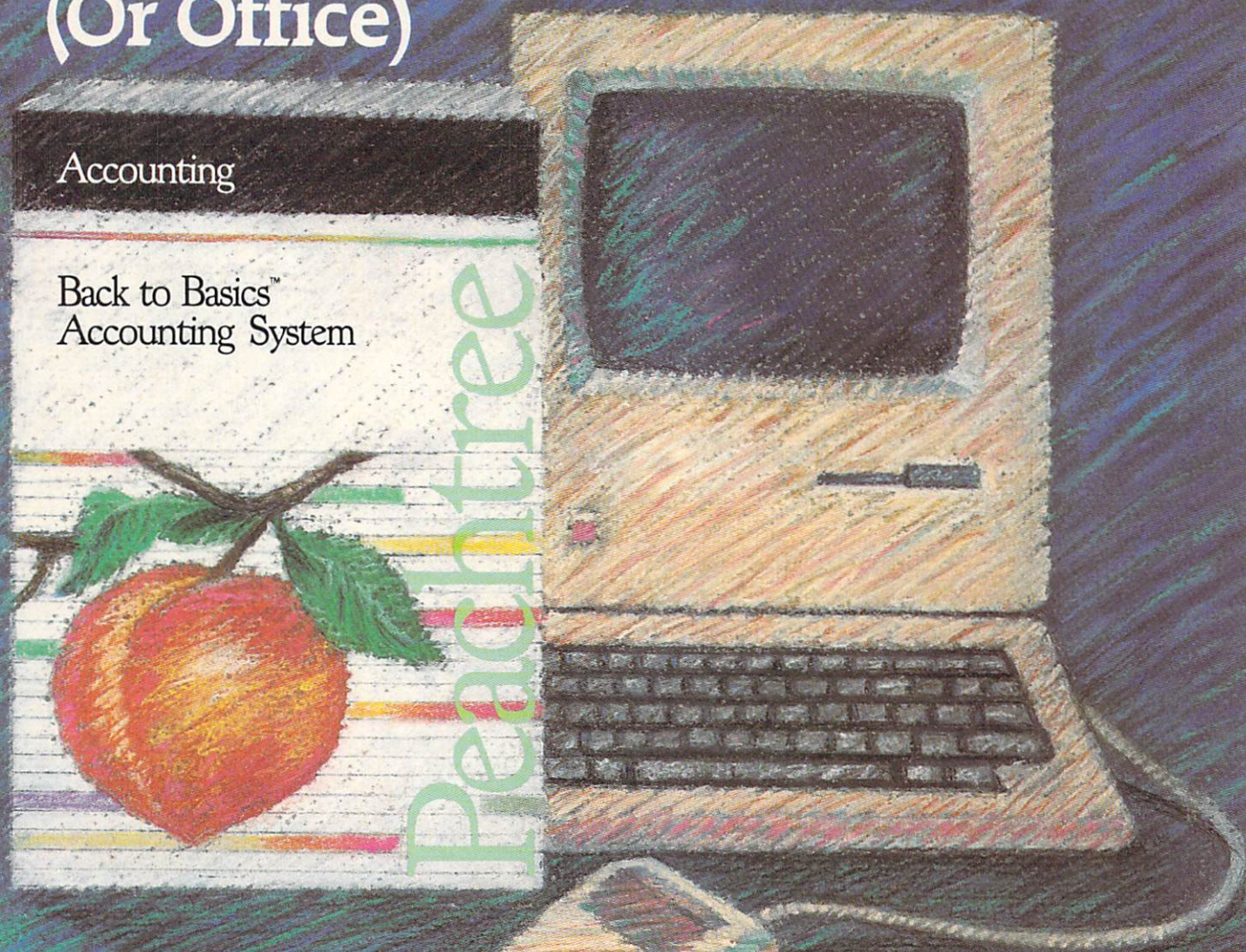
EAGER FOR AN APPLE

I am writing to tell you how much I like your magazine and look forward to every issue. I also like the fact that you have programs and other things in your magazine for the Apple IIe computer. Even though we don't have a computer, we plan to get an Apple IIe very soon. When I first started using a computer I didn't know much until I took a class using an Apple IIe. Then I saw your magazine one day and bought it. I thought it would be too advanced for me until I read it. Keep up the good work!

GREG LIPPERT, age 13
St. Peters, Missouri

FAMILY COMPUTING looks forward to letters from all our readers. Please direct your correspondence to: Letters to the Editor, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit your letters for length and clarity.

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BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

Behind the Scenes at 'Family Computing' TV

It makes sense that a cable TV show called "FAMILY COMPUTING" would be about computers. But a sneak look behind the scenes reveals computers are used in most aspects of the show's production—from writing scripts, to telecommunicating with the show's host on the West Coast, to scheduling the videotaping of actual segments. Here are some highlights of how computers and off-the-shelf software are used at "FAMILY COMPUTING" TV:

Organizing, data-base-style.

Data bases have brought order to the frenzied life of associate producer Valerie Schaer. "It's essential to know every single thing we've done on each of the 26 episodes," she explains. "So, we keep what we call a 'menu' of what was on all the segments in a data-base file."

These "libraries" of information, plus files of all the hardware and software used on the show, are kept using a TRS-80 Model 4 and *Profile Plus*, a data-base program created by Bill Prady. Prady gave up his job as a designer at a software company to become the much-needed resident computer hacker for the TV show.

Word processing. Scripts are written using *AppleWorks* for the Apple computer, *Scriptit* for the TRS-80 Model 4, and *WordStar* for the IBM PC. Scripts then are printed out on one continuous sheet of paper and fed into the teleprompter (a sort of electronic cue-card device).

Telecommunicating. FC TV's host, Larry Sturholm, lives in Seattle, Washington, and commutes to New York every other week to tape the show. Prady electronically sends scripts to Sturholm's computer in Seattle through the modem.

Creating props and graphics.

The graphics in the opening shot of "The Computer Workshop" (a regular segment of the "FAMILY COMPUTING" show) were created by Prady using an Apple computer, an Apple graphics tablet, and *The Designer's Toolkit* and *The Graphics Solution* software.

Props (e.g. the bunny ears Sturholm wore on one show) were generated using an Apple and Broderbund's *The Print Shop* software.



"FAMILY COMPUTING" TV's resident hacker Bill Prady (middle), producer Judd Pilot, associate producer Valerie Schaer, and one of the computers that makes their jobs easier.

Putting it all together. After scripts and props are ready, producer Judd Pilot puts together a schedule of all the elements for upcoming shows using an IBM PC and a *Visi-Calcs*-like spreadsheet program.

"Timing is crucial in any television production," Pilot says. "The total allotted time for the show, including commercial breaks, is just 28 minutes and six seconds."

The computerized spreadsheet program lets Pilot set up "What if" scenarios. For example, if 10 or 20 seconds of time are left over, he can experiment by adding seconds to different segments without wasting actual time during the videotaping.

The "FAMILY COMPUTING" TV show is produced by Alvin H. Perlmutter Inc., in association with Scholastic Productions Inc. It airs at 10:30 a.m. Tuesdays and Thursdays Eastern Standard Time on Lifetime cable TV.

—ANNE KRUEGER

Of Cattle and Computers



Kids in Wrenshall, Minnesota (pop. 331), used to learn a lot about growing cabbage and raising cattle. But

today kids in this farming community are turning away from crops and toward computers.

The Wrenshall School District, with one school building and 30 teachers, is receiving help through a computer-based education plan called the Northeast Educational Technology Consortium (NEETC). Wrenshall is one of five school districts participating in the project, which is designed to link urban and rural students and teachers in Northeastern Minnesota.

With assistance from NEETC, students of Wrenshall can now take computer-aided drafting classes; hook into PLATO, a computer-based education system; and access up to 10,000 hours of educational software. In addition, teachers have on-line access to in-service computer-literacy training.

The \$468,000 project was launched in October 1984 as a national prototype. It is funded through a high-technology grant from the state of Minnesota and through a partnership between the participating school districts and Control Data Corp., a computer and financial-service company.

To be sure, the thought of education without computers has been let out to pasture—even in the country.

Nibbles

For Shoppers: If you have telecomputing capabilities, you can log on to a free-access software library by calling (305) 845-6466. Provided by Searchmart Corp. of North Palm Beach, Florida, the On-Line Software Library includes descriptions, details, applications information, and other details about 3,500 software products—and that number is expected to grow. (Protocol is set for 8 bits, 1 stop bit, no parity, full-duplex.)

For Job Hunters: Considering a major career or job change? Seagate Associates Inc., an executive career-counseling firm in Paramus, New Jersey, will help you find out more about potential employers. Using an Apple III, Seagate conducts searches on a variety of data bases to provide you with information ranging from the company's financial statements to biographical data on key company officers. The average fee is generally about \$75, although this depends on your specific needs. For more information, call (201) 368-1660. ☐

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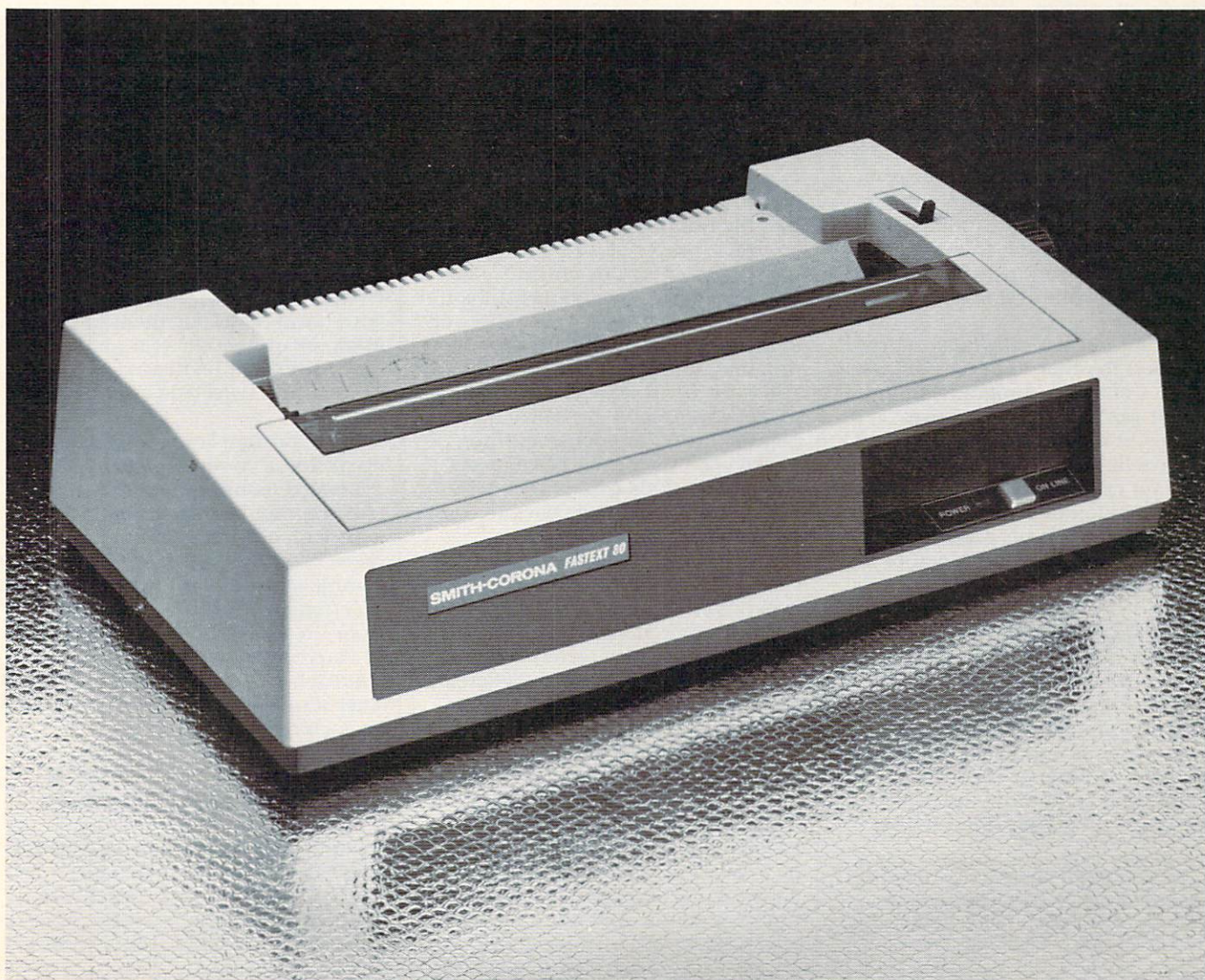
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HOME-SCHOOL CONNECTION

CONTEST FOR THE '80s

How To Set Up Your School's Computer Fair To Be a Winner

BY ANN BALDRIDGE

It was a cold Saturday morning in March 1982 when 16 teenage boys began to set up more than a dozen personal computers in the cafeteria of Warren Township High School in a suburb of Chicago. Before the boys had finished, five members of a local users' group arrived to assume their roles as judges. A completely new kind of programming contest was about to get under way. As the brainchild of two of the school's math teachers, Dick Richey and Esther Keefauver, it was designed to be more like a science fair than a mathematics marathon. The result: the first real high-school computer fair.

Until that Saturday, computer competitions tended to follow much the same format as mathematics contests. That is, several school teams had to wrestle with the same four or five problems. After a specified time limit, each group submitted printouts of its solutions. Because the judges saw only the printouts, they rewarded those most facile in the technical skill of programming.

This format typically fails to draw attention to other important characteristics of a good program, such as: Does it work? Is it easy to use? Is it friendly or abstruse? Do the screen displays help or hinder the operator? Is it original, or is it an improved version of something already on the market? If it's a game, is it fun? How well does it use sound and graphics?

COMPUTER FAIR TO THE RESCUE

In contrast, Warren Township's annual computer fair allows students to enter any kind of program for any microcomputer. Parents can get involved because its structure is flexible and community-oriented. The fair is an all-day event which



family, friends, and the general public can visit. Winners are awarded prizes, and every contestant receives a certificate of participation.

The first fair clearly proved that putting together a piece of software requires more than sheer technical know-how. The next year, not only had the number of participants risen, but a couple of girls had joined the contestants. One entrant, Lisa Ori, a medical-school hopeful, had been programming for only three or four months when she presented her program on learning metrics. By 1984 the fair featured original programs running on virtually every popular brand of microcomputer.

"We use this format because it shows what kids can do creatively," Richey explains. "They have to come up with the idea and carry it through on their own." The fair focuses on long-range planning, work, experimentation, and actually learning how to produce quality software. Each contestant or team plans and writes a program, creates on-screen instructions, and, if appropriate, writes a users' manual. The programs are divided into categories (see accompanying box) and judged against others of a similar nature. Contestants are not divided into age groups. All entries, whether created by a 12- or 17-year-old, are judged on the same criteria. This makes for high standards, and often for very advanced, well-honed programs.

One of the 1983 winners, for example, wrote an entirely new operating system for his history/adventure game. The DOS that came with his machine didn't allow enough disk space for all the pictures he wanted.

Mark Thompson, the 1984 winner in the nongame category, considered entering his *Electronic Gradebook* program in the 1983 fair. "But it didn't allow the teachers enough choices," he said. "I had to make it better and easier for them to use." Mark spent another year achieving that level of sophistication. His users' manual reflected the same standard.

It's important for young people to learn that a complete, well-planned, debugged, bomb-proof, and easy-to-use program cannot be hacked together on a Sunday afternoon. It takes hundreds of hours to produce commercial software—or even Mark's *Electronic Gradebook*. Students from the four schools participating in Warren Township's unique contest each year learn that lesson well. They also learn the joy of setting goals and achieving them.

YOU DON'T HAVE TO BE A COMPUTER WHIZ TO HELP

"We'd love to have parents give us a hand," Richey says. "There are all kinds of things they could do." Carole Miller, a computer "coach" from Waukegan West High School, concurs. "Some of our parents seem to

ANN BALDRIDGE is a freelance writer and computer teacher. For the past three years she has been a judge at the Warren Township Computer Fair.

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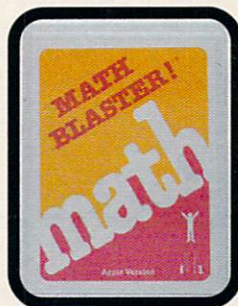


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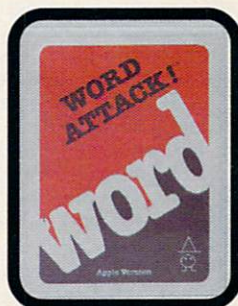


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HOME-SCHOOL CONNECTION

CREATING A BLUE-RIBBON CONTEST

Parents are key in achieving a successful fair. Be a pioneer. By initiating or contributing to the setup of a well-designed, creative computer competition in your school or community, you can help young programmers understand more about what software consumers really need and want.

BEFORE THE FAIR

Determine the basics. Once you've decided to help organize a fair, you'll recognize needs to assess and tasks to distribute. If someone in your community has organized a fair before, it might be best to talk with them concerning pitfalls to avoid and details to be aware of. With the other members of your fair committee, discuss the resources each of you, in conjunction with the school or the community, can draw on to keep costs down and defray any you can't avoid.

Seek contestants. Write letters to the "computer person" in area schools, inviting them to enter their students in the fair. Include a form (which the teacher can photocopy) so contestants can name and describe the programs they wish to submit and suggest a category for them.

Compose press releases for local papers and notices for computer bulletin boards. That helps spread the word to both public and private schools in your community. As the fair approaches, devise "public service" messages for radio and TV announcing the date and features of your fair. A parent with a penchant for the artistic, or one employed in advertising, can design posters inviting other schools to enter. Hang them up in stores and offices, too.

Arrange for a photographer. A parent or a student can take pictures of the fair and the prize-winning contestants. Use them for follow-up press releases and for next year's posters.

Arrange for prizes. A talented "salesperson" should visit local computer and department stores and encourage them to donate prizes in exchange for

publicity. Boxes of disks and discount coupons for software are ideal. Since you don't know what computer the winner will be using, it's difficult to give software prizes. Carry free ads from each prize donor in the fair program, which you'll provide at the door for visitors. Try to give each entrant something else along with a certificate. Tubs of caramel corn or the ubiquitous T-shirt really can hit the spot.

Choose judges. After you get a rough idea of the number of contestants, look for judges. Contact local users' groups, teachers involved with programming in other school districts, the editor of a local computer newsletter, even college computer majors. Your ideal panel would include experts familiar with a number of different computer brands. Make sure that every computer represented in your fair can be judged by at least one of the experts on your team. We found it difficult to judge one boy's program, for example, because none of us had much experience with the TI-99/4A, and couldn't assess which built-in capabilities he had tapped and what he'd created on his own.

Try to entice a big-name software designer or a representative of a well-known computer company to participate. They add glamour and attract good press coverage, as well as bring solid software-marketing knowledge.

If you can't persuade a computer celebrity to attend, invite a local software expert who is in tune with the market. A humorous program presented at our fair, for example, borrowed heavily from a commercial program's funny illustrations on the same subject. To someone unfamiliar with the commercial product, the program appeared much more original than it actually was.

Develop contest rules/requirements. Divide the programs into categories. Three or four usually suffice. For instance, Scientific/Training could include educational programs (a surprisingly large number, since a lot of students

write them for their teachers). Inventory/Other Business (typically written for a parent's small business) could include school gradebook programs, or even a computerized dating service. Arcade/Graphic Games or Word/Logic Games are two more possible categories.

Design a scoresheet. Each category should have its own. Decide what features should be evaluated and what kind of a point system to use. The Warren Township fair used the following features for the nongame categories (top number of points possible for each are in parentheses): Usefulness (15), Clarity of Output (15), Ease of Use (15), Error-handling (20), Complexity (10), Programming Style, i.e. structured logic (10), Documentation (10), Student's Presentation (5). Each of these features can be subdivided into more detail. Error-handling, for example, could include the question, "How bomb-proof is it?"

Questions on the games scoresheet might include: "How well does the programmer use the computer's sound or graphics capabilities?" "How good is the pace of the action?" "How fun is it?"

Set contest guidelines. Give a separate folder to each judge. It should contain the relevant categories' program-description sheets (photocopies of the ones the contestants sent in earlier), scoresheets, and pencils. The judging goes faster if the panel divides into groups, each handling one or two categories.

AFTER THE FAIR

Write thank-you letters. Send notes to all of the people who volunteered their services, including the judges, parents, local software dealers, etc.

Send out a follow-up press release. Include photos of the winners and send them to local community and school newspapers. Name the winners and describe features of the fair. Include the names of the prize donors, the schools represented, and the names and qualifications of the judges.

feel that just buying a computer for their child is enough. Many of them don't realize they may have to get more involved."


Besides hauling a son's or daughter's computer system to the contest, parents who know little about computers can still use their talents toward getting a fair off the ground.

If you're good at organizing, start by forming a group of parents and teachers to stage a computer fair. No matter what the grade level, you'll need to begin planning well in advance. "It took us a good three or four months the first time through to get this off the ground," Keefauver admits.

One of the most challenging problems, Richey says, is contacting and attracting contestants. Schools' computer clubs are ideal conduits of information. Richey also relies on letters to teachers, whom he asks to refer students from their classes.

A parent can help promote fairs, too. If your youngster is taking a programming course, talk to the teacher or department head and find out what kind of programming contest or competition, if any, students can enter. Ask how you can get involved; offer to help with paperwork, car-pooling, promotions, etc. If no contests are on the agenda, work with the teacher to find a suitable

one in your vicinity, or even offer to help set up a computer club in the school or community that could eventually act as a springboard for a computer fair.

If enough parents and teachers make the computer fair popular at the local level, the concept could expand to the regional and even national level. If you need tips on how to get the first fair in your area off the ground, or ideas on how to expand an already existing one, Dick Richey and Esther Keefauver would be happy to help you out. Write to them at the Warren Township High School, 500 N. O'Plain Road, Gurnee, IL 60031. 

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HOME/MONEY MANAGEMENT

HOW TO COPE WITH YOUR TAX RETURN

The Most Common Problem on Tax Forms Is Simple Math Errors. Setting Up a Computerized Worksheet Can Help Solve That.

BY CHARLES GAJEWAY

It's that time of year again. Armed with a shoe box full of papers, some pencils, a calculator, and a dog-eared appointment book filled with cryptic notes, you prepare to do battle with that annual bedevilment known as the 1040. Wistfully, you pass by your home computer, idle and lonely. Wouldn't it be great if you could turn it into a tax wizard? But the thought of programming something so complex makes you nervous, so you just ignore the computer as you sit at the kitchen table, surrounded by shoe boxes.

Wait a minute. True, tax returns can be complicated, and it would be very tough to program a full tax-preparation system. But the most common problem with tax returns is simple math errors, particularly in Schedule A (Itemized Deductions). Setting up an electronic worksheet to organize and keep track of these expenses is easy, and can be a big help in warding off those taxtime blues. This article will show you how to do just that, along with a few spreadsheet and personal-finance tips. Although you'll need some basic understanding of how spreadsheets work, this project is designed to accommodate even the most novice user!

VisiCalc commands and formulas are used in this example, but most spreadsheet programs (*AppleWorks*, *Multiplan*, *Lotus 1-2-3*, etc.) are similar, and may offer formatting features that will make the job even easier. Typed entries appear in SMALL CAPITAL LETTERS, and the instruction to press the carriage return key is denoted ENTER.

A SIMPLE SPREADSHEET

OK, let's fire up the computer and get started—make sure you have a

CHARLES GAJEWAY is a contributing editor to FAMILY COMPUTING. He wrote for the Buyer's Guide in the December 1984 issue.



formatted data disk handy to store your finished worksheet. (And be sure to make a backup copy of your work.) Now, before you start typing madly, stop and think a bit about what you want the end result to be. In this case, you want to create a worksheet that will help review, organize, and add up several categories of deductible expenses. After years of creating spreadsheets, I can tell you that the easiest ones to use are those that present useful hunks of information in whole "screens," i.e. full monitor displays. So, you are going to create a Schedule A worksheet that presents each expense category one screen at a time.

The basic format for detailing expenses is a two-column list: one column for descriptions and one for numbers. The first step, then, is to

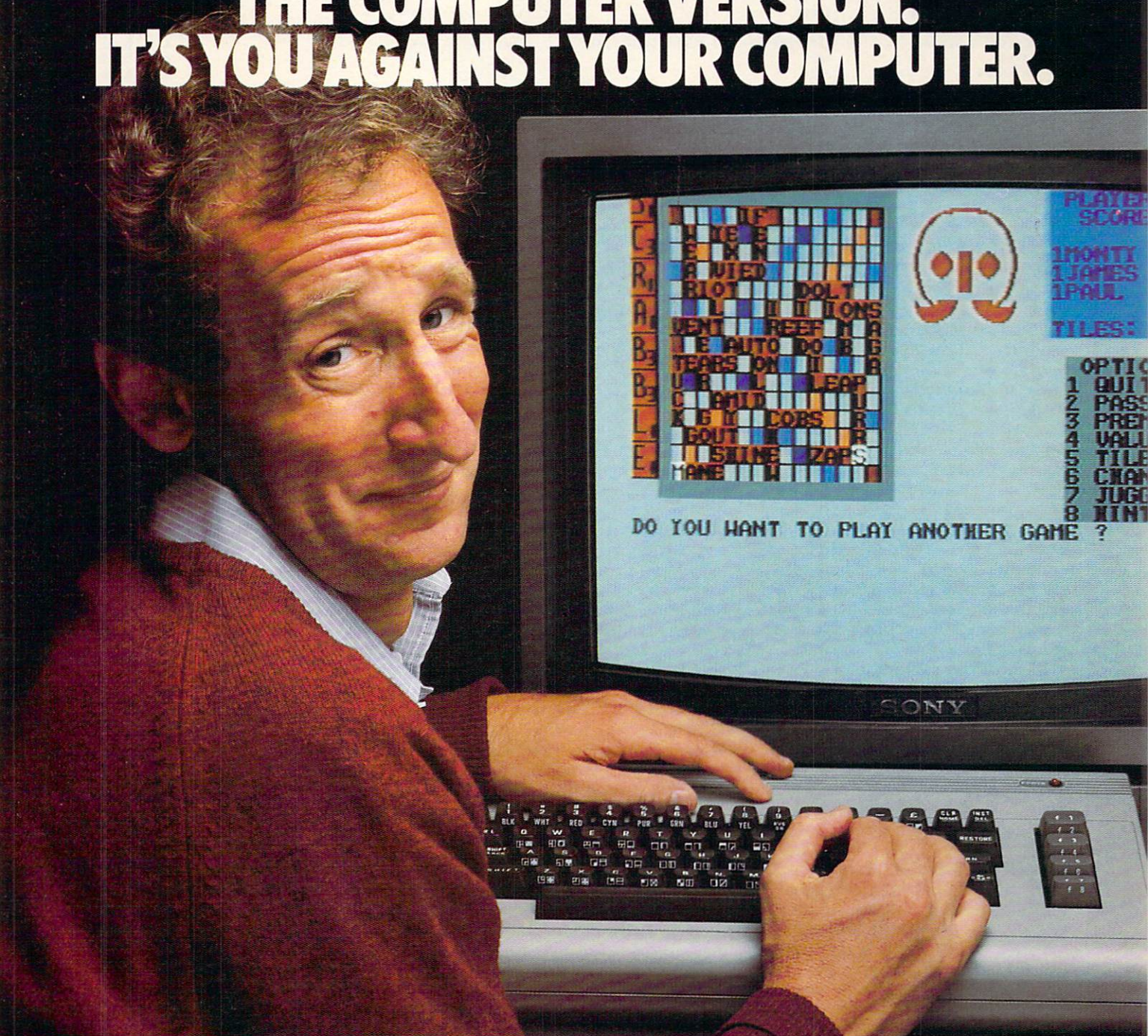
set up worksheet columns (cell widths) so there's plenty of room for a good description. Eighteen characters is good—two columns will take up the whole screen on a 40-column display, and almost half the screen on an 80-column display. Use the VisiCalc command /GC18 (Global Column width 18), then press ENTER.

Now for some titles. Let's label the whole worksheet 1040 SCHEDULE A WORKSHEET. In order to center the title, type "1040 SCHEDULE A WORKSHEET" into cell A1, press ENTER, then type /FR (Format Right-justified). Type E A WORKSHEET into cell B1, and press ENTER. This will make the two labels appear as one, centered over the worksheet. Move down a row and type /WH (Window Horizontal) so that the title line will remain in place while you are working. Then type a semicolon to

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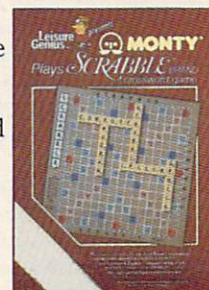
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HOME/MONEY MANAGEMENT

=====A=====		=====B=====	
11	1040 SCHEDULE A WORKSHEET	11	1040 SCHEDULE A WORKSHEET
=====0=====		=====P=====	
11	ITEMIZATION SUMMARY	11	ITEMIZATION SUMMARY
21		21	
31	ADJ. GROSS INCOME 35000	31	ADJ. GROSS INCOME \$35,000.00
41		41	
51	MEDICAL & DENTAL @IF(D20>(P3*.05),D20-(P3*.05),0)	51	MEDICAL & DENTAL \$1,350.00
61	TAXES +F20	61	TAXES \$2,845.00
71	INTEREST +H20	71	INTEREST \$1,040.00
81	CONTRIBUTIONS +J20	81	CONTRIBUTIONS \$3,266.00
91	CASUALTY LOSSES @IF(L20>(P3*.1),L20-(P3*.1),0)	91	CASUALTY LOSSES \$0.00
101	MISCELLANEOUS +N20	101	MISCELLANEOUS \$850.00
111	TOTAL @SUM(P5...P10)	111	TOTAL \$9,351.00
121	STANDARD DEDUCTION 3400	121	STANDARD DEDUCTION \$3,400.00
131	NET DEDUCTIONS +P11-P12	131	NET DEDUCTIONS \$5,951.00
141		141	
151		151	
161		161	

The AppleWorks printout at left shows sample summary columns detailing each spreadsheet formula, while the printout at right shows the final tally.

move the cursor back to the main part of the spreadsheet.

Move the cursor to C1 and type MEDICAL & DENTAL, then press the right arrow. Type AMOUNT, ENTER, then /FR. Now move the cursor to column C of the very last row on the screen—let's say it's 20—and type TOTAL, press ENTER, and type /FR. Move to column D and type in the formula @SUM(D3...D19). Now look at what you've created.

The first part of the worksheet is a screen that will hold 17 entries for medical expenses and add them up automatically. Every time you enter another item or change an incorrect one, the total automatically is updated with complete accuracy. No more simple math errors!

OK, now you can add more screens by moving across the worksheet. Do one for each of the remaining Schedule A categories—TAXES, INTEREST, CONTRIBUTIONS, CASUALTY LOSSES, and MISCELLANEOUS. Make a note of the cell address of each total. Once that's done, you can add the final touch—a summary screen.

A FLEXIBLE SYSTEM

But what happens if you have more than 17 items in an expense category? Use a worksheet-expansion trick I call "neighbor screens." With this method, you simply create a second screen of entries to the right of the first by inserting two blank columns with /C. Then you change the total formula to add the two ranges of entries, i.e. @SUM(D3...D19)+@SUM(F3...F19). I suggest that the last entry in the first screen of a category be CONTINUED TO RIGHT, or something similar. This will remind you that there is more than one screenful of entries.

Now, on to the summary. Moving to your final column—let's say it's O1—type in a heading for the summary, and spread it across to column P as well, if you like. You can

center the title as you did the heading for the entire worksheet. In this case, we'll use ITEMIZATION SUMMARY as a heading. Now move down to O3 and type in ADJ. GROSS INCOME, then press ENTER. Skip another row down to O5, then type in the titles of the major expense categories, one to a row. Next to MEDICAL & DENTAL, type in the formula @IF(D20>(P3*.05),D20-(P3*.05),0). This is a conditional computation that says, "If medical and dental expenses are greater than 5 percent of my adjusted gross income, then the deduction equals my expenses minus 5 percent of my adjusted gross income. Otherwise, the deduction is zero."

Next to all the remaining titles except CASUALTY LOSSES, type a plus sign (+) followed by the address of the cell that is the total of each expense category (i.e. +H20, +J20, etc.). This formula is basic spreadsheet lingo for telling the computer to get the value from whichever cell you're directing it to.

For CASUALTY LOSSES, you will need another conditional formula. In cell P9, type: @IF(L20>(P3*.1), L20-(P3*.1),0). After you've completed all your expense entries, go to the next row of column O, type TOTAL, press ENTER, then in the cell to its right, enter the formula @SUM(P5...P10). Back to the next row in column O, type STANDARD DEDUCTION. Next to it in column P, enter the proper amount from Schedule A.

Finish the summary screen by going to the next row in column O, and typing NET DEDUCTIONS. Next to it, enter the formula +P11-P12. The summary screen now picks up all the totals from each expense screen, does all the required computations, and shows a mathematically correct total of itemized deductions.

Caution: The formulas in this article were written before the end of last year, based on the information available to us at the time about the

rules for preparing a 1984 tax return. Please double check the instructions for the 1984 forms to ensure these formulas are up to date.

In addition, you must be sure that all the deductions you enter on this worksheet conform to the correct IRS regulations. Certain expenses are subject to a minimum level; other expenses are not allowed. This article is not designed to offer tax advice—but to help you set up a system to cope with Uncle Sam.

THE LESSON LEARNED

What's the payoff from this project? First, you have an easy-to-use tool that will help prevent math mistakes when preparing tax returns. Now, instead of worrying about math and wasting time repeatedly adding up messy columns of figures, you can concentrate on finding all your deductions and entering them in the proper category. In addition, printouts of the worksheets can be used as the supporting detail that is sometimes required with your return, or in the event of an (ugh!) audit.

Second, you have a tool to help keep track of deductions during the year, instead of sifting through overflowing shoe boxes as April 15 looms on the calendar. If you take an hour each month to record your expenses, a good deal of the work on your return will be done by the time your W-2 or 1099 arrives.

Last, you can use the same techniques used in creating the Schedule A worksheet to expand it, or create new worksheets to assist in preparing other tax forms, including the 1040 itself. So the short time spent in setting up an electronic spreadsheet easily can be saved in future time and tax return dollars.

Other tax-related topics will be covered in future columns, so put together your Schedule A worksheet, and stay tuned! ☐

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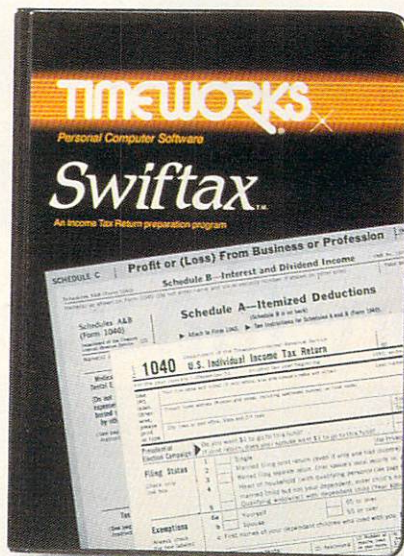
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Apple* family; Commodore 64***



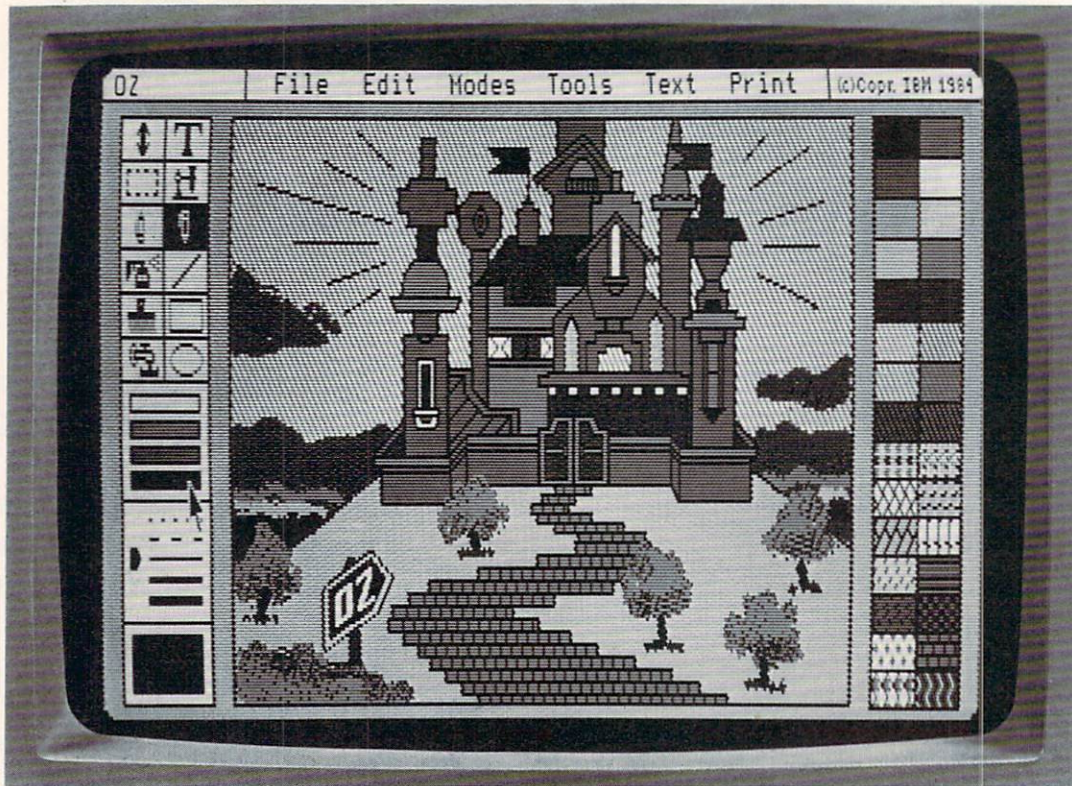
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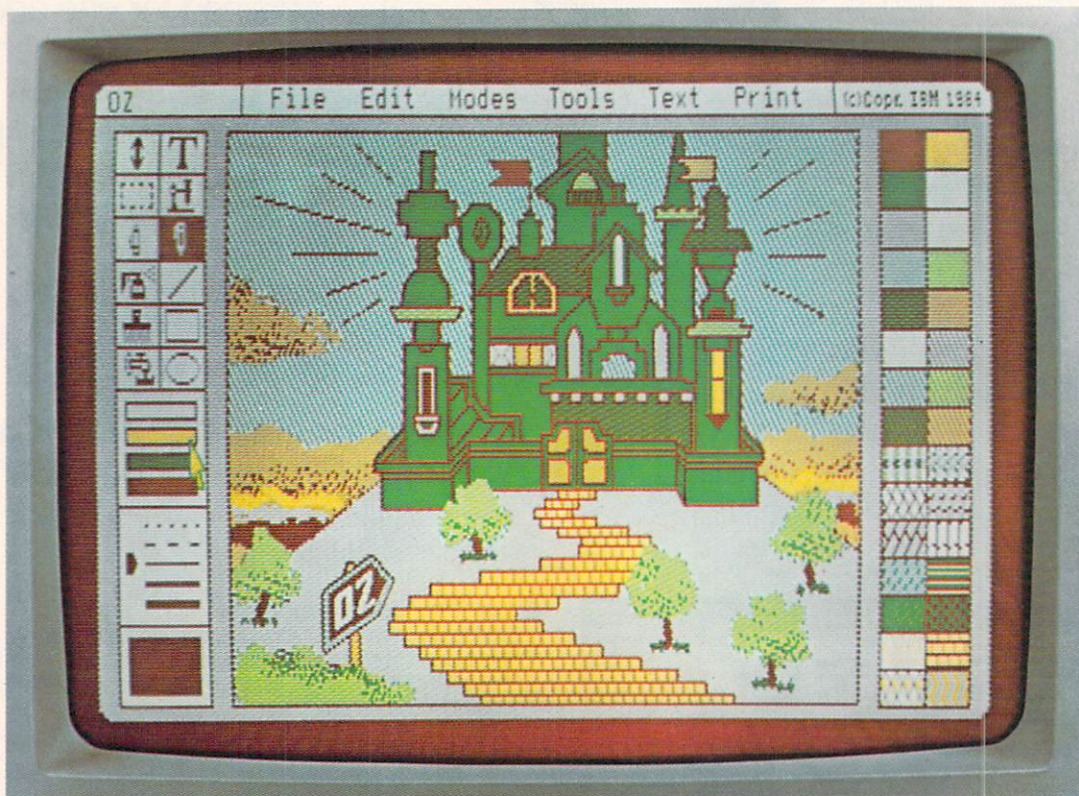
■ The Evelyn Wood Dynamic Reader
 ■ The Electronic Checkbook
 ■ The Money Manager
 ■ Swiftcalc
 ■ Wall Street
 ■ Sylvia Porter's Personal Finance Manager
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it's more fun in color.



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"painting" on most computers and you'll
have to settle for black-and-white
pavement.

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PCjr ColorPaint—a \$99* cartridge
program that lets you paint with PCjr.
In living, sparkling color.

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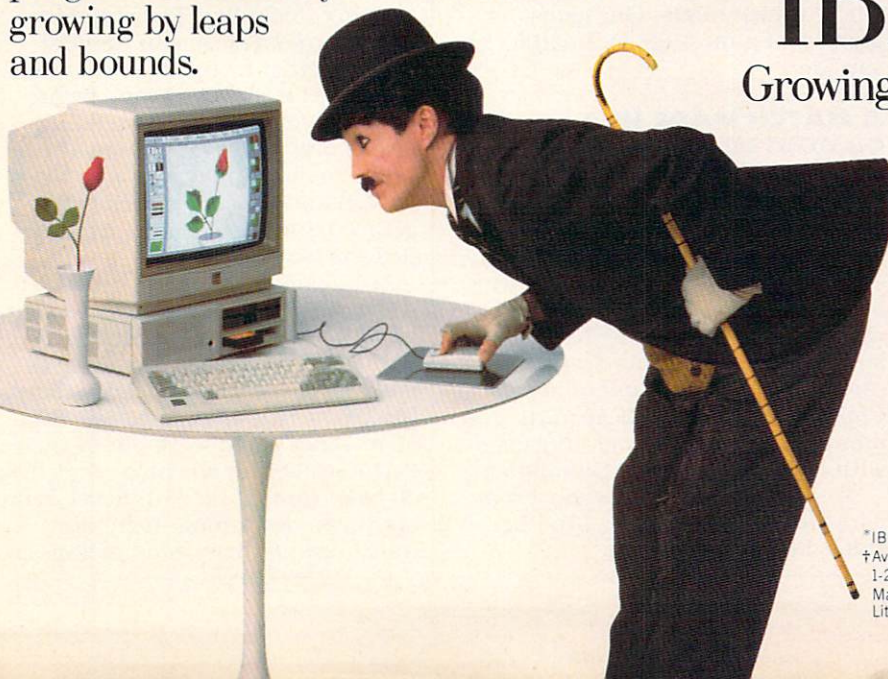
It's sophisticated,
yet extremely
easy to use.
(It works with
a friendly little
mouse.†) So you
can sit right down
and paint just about
anything you can think.

Whether you're an artist or
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With PCjr ColorPaint, you can work
with 16 colors—4 at a time—over 2,700
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you put together lines, shapes, patterns,
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program in a library of software that's
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and bounds.



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with other computers at its price.

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Diskette Drive	Display
Double-sided, double density	40- and 80-column
Capacity: 360KB	Resolution:
	4-color: 640h x 200v
	16-color: 320h x 200v
Processor	Expandability
16-bit 8088	Open architecture
Keyboard	Optional 128KB
Typewriter-style	Memory Expansion
Detached; cordless	Attachment(s)
Warranty	13 ports for add-ons, including built-in serial interface
1-year limited warranty	

IBM PCjr

Growing by leaps and bounds.

*IBM Product Center prices. Computer price does not include monitor.

†Available from manufacturers other than IBM.

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GAMES

DESIGN FOR LIVING

The Team Behind *Archon*, and Its Strategy for Success

BY JAMES DELSON

The family that computes together, stays together, or so they say. But how about the couple that designs computer games together? Well, that's what Jon Freeman and Anne Westfall do. Also known as Free Fall Associates, they're the team, along with Paul Reiche III, behind the groundbreaking strategy game, *Archon*, and its successor, *Archon II: ADEPT*, both by Electronic Arts.

Archon has received recognition from five magazines and Electronic Arts' own in-house awards as a fantastic contribution to the sprawling field of computer entertainment. Designers and game critics alike applauded it as one of last year's high-water marks, in terms of originality, game design, playability, excitement level, and graphics. And, it's had a long, healthy life on numerous best-seller lists.

Archon II: ADEPT, Free Fall's most recent Electronic Arts creation, is no letdown (see review in the December 1984 FAMILY COMPUTING). Equally, if not more, enjoyable than its predecessor, it had an early debut on *Billboard Magazine's* Top 10 list.

Computer-game designers aren't a widely celebrated bunch. No fear of being recognized in the laundromat for Jon and Anne (who worked with Robert Leyland and Paul Reiche on *Murder on the Zinderneuf*, another Electronic Arts favorite). More important to them, however, is the critical acclaim their games have received. "I don't feel like a star," says Anne. "But the recognition is nice. Especially because we're finally getting it. Not to have it is detrimental

JAMES DELSON, FAMILY COMPUTING's games critic, works at home. *Archon's* one of the games his playtesters demand over and over again.



Husband and wife, Jon Freeman and Ann Westfall: just a couple of game designers.

to the creative process."

"It shows that somebody somewhere understands. Our games aren't just a message in a bottle," says Jon.

A MATCH MADE IN A COMPUTER FAIR

Freeman and Westfall, both 39, met five years ago, working adjacent booths at the West Coast Computer Faire. She was programming for a structural engineering firm. He was at Automated Simulations (now Epyx), a games company he'd launched to market his first games (including *Crush*, *Crumble*, and *Chomp!* and *Temple of Apshai*). Jon lured Anne away to program games with him at Automated Simulations.

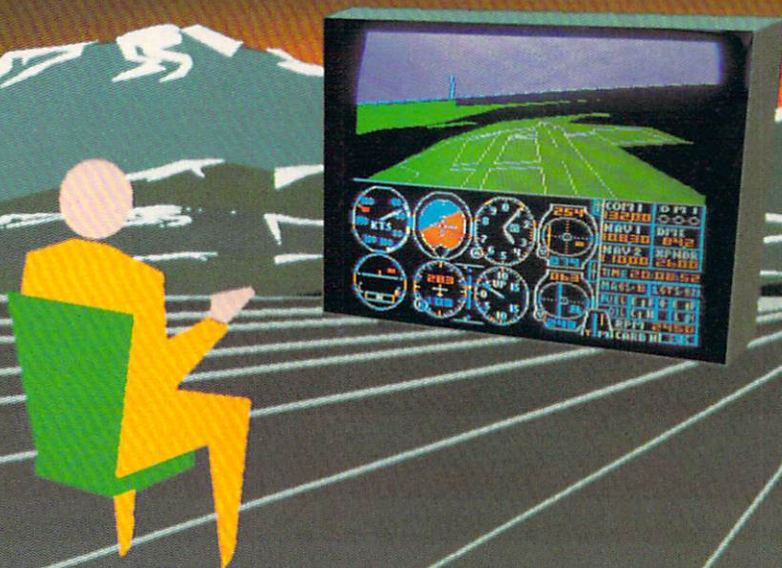
"It seemed like a financially promising deal," Anne recalls. "And besides, I sort of liked Jon."

At Automated Simulations, the two worked on a number of projects together, including *Tuesday Morning Quarterback*, one of the first computerized football games on the market. But, it wasn't long before they got itchy. "I ended up doing work I didn't enjoy," recounts Anne. "I like to develop my own programs. So Jon and I sort of struck out together." Shortly after, the two also tied the marital knot.

As a team concerned more with the design process than the marketing and advertising aspects needed for a game's success, the newly established Free Fall Associates found Electronic Arts the perfect environment. They could work out of their Portola Valley home doing what they do best, coming up with ideas, refining them, developing them, and transforming them into fanciful, riv-

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GAMES

eting programs. E.A. took care of the rest.

"We had a tough schedule at first," reports Anne. "For six months we didn't even read a book or go to the movies, and that's disaster in our house. We basically worked all the time." Says Jon: "We did both games (*Murder on the Zinderneuf* and *Archon*) from scratch in six months. We got boring."

"At meals we were always discussing the games. How to do this, and what to do about that. We worked from the time we got up until all hours of the night. Then we'd get up the next day, grab a cup of coffee and go back to work," recalls Anne.

A RELAXED PARTNERSHIP

Not many marriages could weather that kind of 24-hour togetherness.

"In the early stage of working together it was difficult. We were afraid of crossing boundaries," says Anne. She's the programmer in the family. He's the designer. "After we realized we weren't going to run roughshod over one another, we relaxed," adds Jon.

The union has evolved into an easy partnership: "Jon comes up with the concepts and then discusses them with me," she explains.

"Usually several at once," he notes. "Anne sees what is most appealing, what sounds most irresistible. Next, I do a script, a detailed outline of what the game's all about. I consult with Anne to make sure it's feasible. Then she sits down and does the program design. Paul [*the third member of their team*] and I go and work on shapes and patterns; elaborate on the characteristics and powers of opponents, how objects and images should look."

"Not that this is an organized process," remarks Anne. Often, she plays through his designs, noting areas that players may enjoy or dislike. And he helps her in the debugging phase.

The time element is important. "If she's bogged down in programming, then I might work on an area that she's usually responsible for. It doesn't do any of us any good to sit around and twiddle our thumbs."

The same teamwork helps take care of the cooking and cleaning. Both pitch in. Says Anne: "We work and work and don't want to bother with taking an hour out to prepare dinner. We often go out. We like the Good Earth, a neighborhood spot. And we have a microwave. That's a necessity." Jon adds: "We've discov-

ered Lean Cuisine and a bunch of new frozen foods."

ON THE GENDER GAP . . .

Obviously, Anne avoided falling into the gap that isolates so many women from the computer. She's always been good at math, and her programming experience goes back to her days in college. Still, in spite of her career, and Jon's, she found herself in the same predicament many parents face. Her own daughter (from a previous marriage), now 20 and married, showed no interest in the computer.

It wasn't until Anne brought home her IBM PC and began describing some of the things she could do with Electronic Arts' *Get Organized!* (a new, multiple-use word processor, data-filer, calendar, and address book), that her daughter perked up. "It's the perfect thing for her," Anne says.

Anne and Jon are concerned that girls aren't getting a fair shake with computers. As they see it, the problem has to do with the environments in which boys and girls first meet computers.

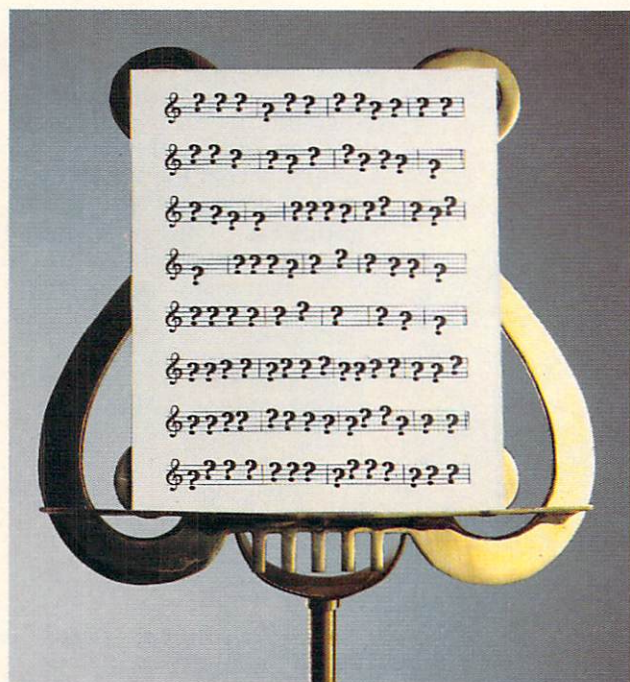
"Put into a room with computers, boys rush over to the machines, whereas girls stand back and want to appear ladylike," observes Anne. "I hate to separate the boys from the girls, but if it takes separating them to allow girls to have free rein over the computers themselves . . ."

Girls and women sometimes shy away from computers because of their discomfort with hardware, both Anne and Jon believe. People don't realize, however, that using the computer "is like boiling water. You don't need to know what's happening in order to do it," says Anne. "At our house, whenever we have to do anything more to the computer than plug in a board, we have to call somebody."

As for the future, the Free Fall file is full of concepts and ideas waiting to be implemented. The focus currently lies with fantasy and sci-fi games. Jon and Anne continue to work closely together. It's the formula that's helped them succeed—as a family, as well as one of the leading game-design teams in the country.

"It's a process of learning to communicate, making sure the other one's happy," says Jon. "These requirements are good for our relationship. It makes the idea of working with other people look unappealing. Sometimes I feel we're a commercial for being self-employed." ☐

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TELECOMPUTING

A GUIDED TOUR OF MENUS

Try a Telecomputing Service. Using One Can Be as Easy as Ordering Dinner!

Using a bulletin board or a commercial information service is like ordering a family dinner in a Chinese restaurant. You get to choose one of the main selections, an item from a list of side dishes, perhaps a dessert, and so on until you're full.

Menus—and menus within menus—are what many telecomputing systems rely upon to guide a user from one workplace “station” to another. A caller has the option of heading in a certain direction, and then is given more options at every junction along the way. It's not like an ordinary meal, but a very long dinner, with a number of courses—and decisions to make.

WHICH ROAD TO TRAVEL?

To illustrate the variety of choices available to you, I decided to spend time rambling down some of the forked paths of several information services. This, of course, can only provide you with a glimpse of the possibilities available to information-service subscribers.

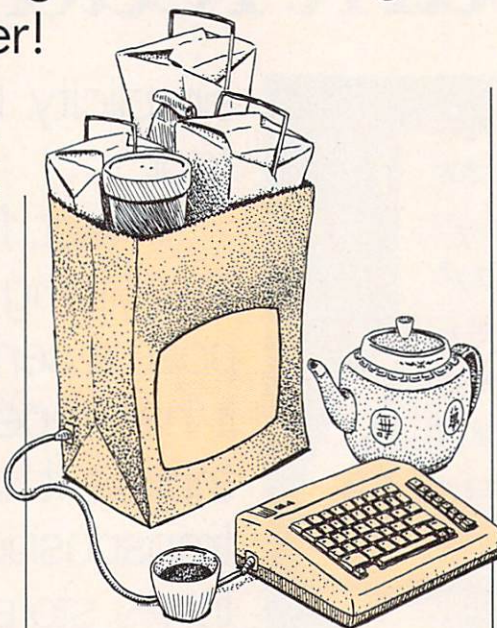
My first call was to the CompuServe Information Service (CIS) number, to talk with the cross-country characters on the popular CB Simulator. The first thing I saw on the screen—once my modem and phone had made the connection—was a request for my User ID number and my password. I entered both on the keyboard. (My official user ID number is 75775.351, if you want to contact me.)

After passing electronic inspection, I entered the world of menus.

First, CompuServe gave me the time and the date, in case I had become so carried away with my computer work I had forgotten. Next, I confronted a list of new items on the service that week—a movie-review page, a new store opening, and updated news features.

FOR MORE INFORMATION, TYPE “GO NEW!” AT THE PROMPT, the screen said. I

P. GREGORY SPRINGER is a freelance writer from Urbana, Illinois, and the author of a computer handbook for college students, called *Electronic Notebook* (dillithium Press). He wrote “Seven Tricks for Better Word Processing” in the January issue of *FAMILY COMPUTING*.



didn't want more information about those things, at least not for the moment. When CompuServe's exclamation point prompt appeared on the screen, I simply hit the RETURN key, still waiting for my first menu of the evening. Here's how it looked:

```
COMPUERVE PAGE CIS-1
COMPUERVE INFORMATION SERVICE
1 HOME SERVICES
2 BUSINESS & FINANCIAL
3 PERSONAL COMPUTING
4 SERVICES FOR PROFESSIONALS
5 THE ELECTRONIC MALL (TM)
6 USER INFORMATION
7 INDEX
ENTER YOUR SELECTION NUMBER,
OR H FOR MORE INFORMATION.
```

CompuServe's first menu page currently has seven main branches. They lead to a business department, a section for games and useful programs, a shopping area to read about and order products, an index, and the Home Services pathway.

The roads and alleys of CompuServe menus overlap. A line chart of the system would appear more tangled than a Los Angeles freeway map, but stepping from menu to menu—choice by choice—makes the travel easier. (Because services like CompuServe are always coming up with new offerings, and adding and changing features when appropriate, menus also may change.)

You can reach the CB Simulator through either Home Services or Personal Computing; to reach the

BY P. GREGORY SPRINGER

FAMILY COMPUTING electronic edition you go through Personal Computing. Or, you can bypass the roads altogether and “fly” by typing the GO command. GO CB will take you directly to that part of the system; GO FAM leads you directly to our offerings.

In this case, I picked “1” from the main menu, to see what it had to offer. The new menu for Home Services showed me:

- 1 NEWS/WEATHER/SPORTS
 - 2 REFERENCE LIBRARY
 - 3 COMMUNICATIONS
 - 4 HOME SHOPPING/BANKING
 - 5 DISCUSSION FORUMS
 - 6 GAMES
 - 7 EDUCATION
 - 8 HOME MANAGEMENT
 - 9 TRAVEL
 - 10 ENTERTAINMENT
- LAST MENU PAGE. KEY DIGIT
OR M FOR PREVIOUS MENU.

This menu seemingly needs little explanation. A service such as CompuServe offers the valuable resource of information—much like a library—in any of these clear-cut categories, and more. But what about COMMUNICATIONS? Would that section relate to telephone service? To interpersonal relationships?

I punched “3” to see.

```
1 ELECTRONIC MAIL
(USER TO USER MESSAGES)
2 CB SIMULATION
3 NATIONAL BULLETIN BOARD
(PUBLIC MESSAGES)
4 USER DIRECTORY
5 ASK AUNT NETTIE
6 CB SOCIETY
7 LOVE MESSAGE
LAST MENU PAGE. KEY DIGIT
OR M FOR PREVIOUS MENU.
```

Aha! The CB SIMULATOR was listed in this menu. It was tempting to take a different path. Aunt Nettie may have been able to answer some of my questions, I could have sent a special valentine via electronic mail by punching “7,” or I could have read some of the ongoing discussions on the national bulletin board. But I pressed “2,” and was told THIS PAGE HAS BEEN REPLACED BY A SPECIAL CB PAGE. TYPE “GO CB” TO ENTER THE CB SIMULATOR. So I did.

- ```
CITIZENS BAND SIMULATOR
1 INSTRUCTIONS
2 CB ETIQUETTE
3 CB BAND A (MAINFRAME A)
```





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You also receive automatic membership in TWA's Frequent Flight Bonus<sup>SM</sup> program. And you can build bonus points by staying at Marriott and Hilton hotels and by using Hertz Rent-A-Car.

Besides Travelshopper, CompuServe offers an ever-growing list of other travel-oriented on-line services.

**The Official Airline Guide Electronic Edition** lists direct and connecting flight schedules for over 700 airlines worldwide plus over 500,000 North American fares.

**Firstworld Travel** offers worldwide travel advice and service.

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**1-800-848-8199**

In Ohio, Call 1-614-457-0802



## TELECOMPUTING

4 CB BAND B (MAINFRAME B)  
5 CBIG SPECIAL INTEREST GROUP  
6 CB SOCIETY, CUPCAKE'S COLUMN  
7 COMPUTING ACROSS AMERICA  
8 COMPUSERVE CB SEMINAR ADDRESS  
LAST MENU PAGE, KEY DIGIT  
OR M FOR PREVIOUS MENU.

And still more menus appear. Without taking time to read the instructions or etiquette (I'd been through this menu before. Otherwise, I would have begun with INSTRUCTIONS), I punched "3" to enter the world of interactive computing on the CB Band A. Here, people from all over the world are able to converse simultaneously, as the words they type appear on the screens of all those tuned into the various channels on the CB. You can talk with a group, or arrange to move into private talk mode.

The CB SIMULATOR asked me for a "handle," the name that appears on the screen along with my comments. After I'd decided to call myself BRONCO, I chose a channel and joined a conversation with a group of people, including VIDEO KID, DIDINO, LOOLOO, OGRE, and DEBBIE.

Everyone talks at once on the CB. I spent about an hour switching channels, talking with people, playing imaginative games, and exchanging information. Then it was time to leave. After exiting from the CB, I could have back-tracked through the menu system by hitting "M" at every prompt. But since I could log off from CompuServe by entering OFF at any prompt, I didn't bother.

### A NOVEL IDEA

Delphi is another telecomputing service that offers everything from UPI news, travel schedules, banking, shopping, games, and electronic mail to a research library of more than 200 data bases. One of its other features is a collaborative novel system that allows you to write paragraphs or chapters to add to any of several ongoing novels. Users can start these novels, choosing basic topics themselves, and then other subscribers can read and write into them.

Delphi uses menus, also, but they are alphabetical lists rather than numbered items. Being as friendly as possible, Delphi asked me outright what I wanted to do.

MAIN MENU:  
BULLETIN-BOARDS  
CONFERENCE  
DELPHI-ORACLE  
EXIT  
FINANCIAL-SERVICES

## PICK OF THE MONTH

### How to Get the Most Out of CompuServe

By Charles Bowen and David Peyton

**Bantam Books**  
**\$12.95**

Every month this column spotlights a best buy in telecommunications hardware, software, or accessories. This month's pick is for anyone who's thinking of becoming, or is already, a subscriber to the CompuServe Information Service. Written in a lively style and liberally sprinkled with example "screens," this guided tour of CompuServe will help you master the system in a fraction of the time it would take by trial and error. Even experienced subscribers are likely to find something new. You'll learn about the CB simulation, special interest groups, electronic mail, financial services, shopping-by-modem, multiplayer gaming, and more. A chapter is devoted to customizing the system to your computer and using the expert, "no menus" mode. And since time is money on any commercial system, you can get more value for your on-line time by moving around quickly.

GAMES  
HELP  
INFOMANIA  
LIBRARY  
MAIL  
NEWS  
ONLINE-MARKETS  
PROFILE  
SCHEDULER  
SPECIAL-INTERESTS  
TRAVEL  
WRITERS-CORNER  
MAIN>WHAT DO YOU WANT TO DO?

I didn't know. That was quite a long list, and it didn't say "group novel" anywhere on it. I tried punching SPECIAL, short for SPECIAL INTERESTS.

SPECIAL INTERESTS MENU:  
APPLE SIG  
ATLANTIS  
BUSINESS SIG  
CAFE BOZART  
COMPUTER KIDS INTERNATIONAL  
GAMES SIG  
MEDICAL SIG  
MENSA SIG  
PAN SIG  
RACING SIG  
SPACE RESEARCH  
TRANSLATION INTERPRETATION SIG  
USER ADVISORY PANEL  
WEN (WRITERS & EDITORS NETWORK)  
GENERAL INFORMATION  
EXIT  
SIGS> (GENERAL OR GROUP NAME)?

Nope. These were special interest groups, but none devoted to a novel. Although again tempted by some of these possibilities, I picked EXIT and was returned to the main menu. I tried another choice, INFO.

INFOMANIA MENU:  
AUTHORS  
BOOKSHELF  
COLLABORATIVE-NOVEL

EXIT  
HELP  
MEMBERS-CHOICE  
NEWSLETTER  
POLL  
IAMWHOIS  
INFO>(AUTH, BOOKS, COLL, MEMB, NEWS,  
POLL, IAM)

By choosing COLL—the abbreviation listed for COLLABORATIVE NOVEL—I was whisked into the world of group writing. Another menu appeared quickly with more options.

COLLABORATIVE-NOVEL MENU:

ADD  
CREATE  
EDIT  
EXIT  
HELP  
LIST  
READ  
NOVEL> (ADD, CREATE, LIST, READ)

From this menu, I chose READ, then chose TOGA, TOGA, TOGA, which had the sound of good sophomoric humor to it. But a warning came across the screen that it might contain some offensive material. After reading the first chapter, the only thing offending me was the writing style, so I returned to the menu, this time opting to read SUNSET OVER THE SEINE.

The author of Chapter One was named Jsaras, and he or she had written this opening romantic narrative on June 2, 1984. WHEN I ARRIVED IN PARIS LAST TUESDAY, the story began, IT WAS RAINING. THERE'S NOTHING UNUSUAL ABOUT THAT: IT ALWAYS SEEMS TO BE RAINING WHEN I GO TO PARIS.

That's all Jsaras wrote. The story would have to continue from someone else's keyboard, as well it did.

Chapter Two was entitled RAIN-DROPS KEEP FALLING ON MY HEAD, written by Brough on July 19, more than a month later.

OF COURSE, I NEVER GO TO PARIS MUCH, AS A MATTER OF FACT, THIS IS ONLY MY SECOND VISIT. THE FIRST TIME I CAME, IT WAS DURING THE WAR. I REMEMBER THAT IT WAS RAINING THEN, BECAUSE NONE OF MY PHOTOS TURNED OUT VERY WELL. OF COURSE, I WASN'T THERE JUST TO TAKE PHOTOS.

What was the author(s) doing in Paris? Would it be up to me to determine the course of this history? No, in fact, someone named Artemis had continued the tale on July 25, with a new chapter entitled SUNSET.

When the novel ended, Delphi asked me directly to take up the pen.

WOULD YOU LIKE TO ADD ANOTHER CHAPTER (Y/N)?

Passing up this challenge, I logged off with an elapsed session time of only seven minutes. →

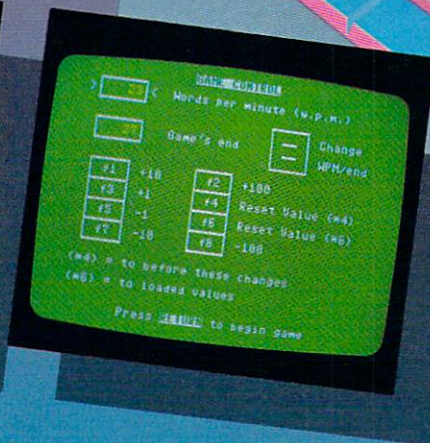
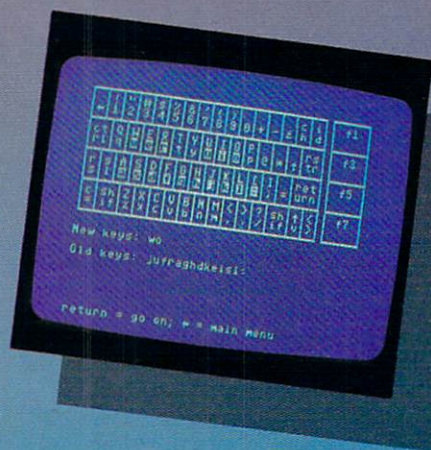
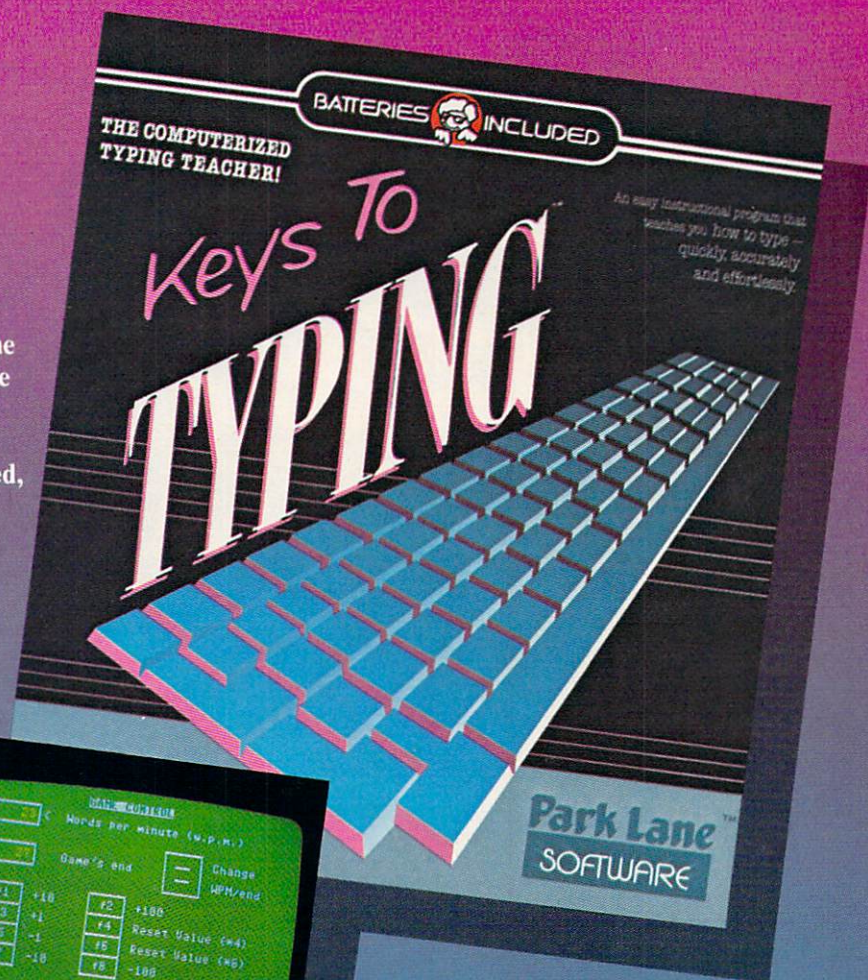


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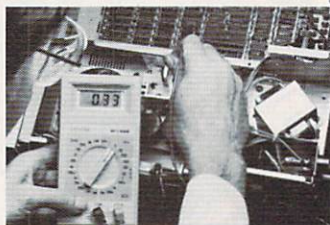
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It was already well after midnight and I was sleepy. I had one more stop on-line before I could sleep, and that was checking into my electronic mailbox on The Source, where my user ID is BBW802.

WELCOME TO THE SOURCE

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2 TODAY

3 BUSINESS UPDATE

4 THE SOURCE MAIN MENU

5 WHAT'S NEW

6 COMMAND LEVEL

ENTER ITEM NUMBER OR HELP

I pushed "4."

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3 CATALOGUE SHOPPING

4 HOME AND LEISURE

5 EDUCATION AND CAREER

6 MAIL AND COMMUNICATIONS

7 PERSONAL COMPUTING

8 SOURCE+PLUS

ENTER ITEM NUMBER OR HELP

I punched "6."

MAIL AND COMMUNICATIONS

1 MAIL

2 CHAT

3 POST

4 PARTICIPATE

5 MAILGRAM MESSAGES

6 ECOM MESSAGES

7 MEMBER DIRECTORY

ENTER ITEM NUMBER OR HELP

I took "1."

MAIL

1 OVERVIEW

2 INSTRUCTIONS

3 MAIL CHECK

4 MAIL SEND

5 MAIL READ

6 MAIL SCAN

7 MAIL DISPLAY

ENTER ITEM NUMBER OR HELP

As I headed down pathway "3," the system paused for a few seconds before handing me the message: YOUR MAILBOX IS EMPTY AT THIS TIME.

Unfortunately, there is no HELP button to fill up an empty electronic mailbox. But it's not always that way. I typed QUIT, and went to bed, knowing that tomorrow brings another mail delivery. **FC**

## ELECTRONIC EDITION

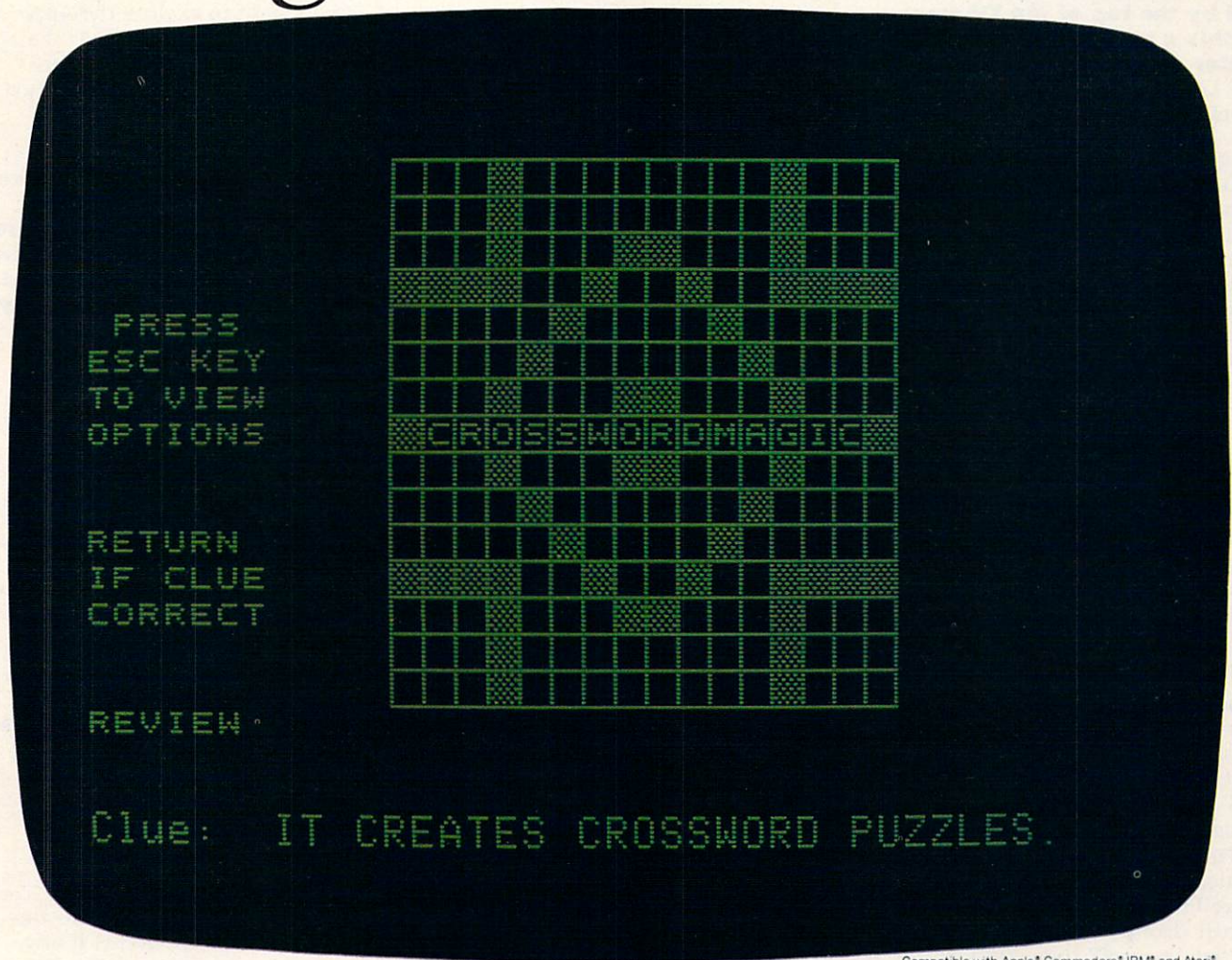
FAMILY COMPUTING has started an "electronic edition" on CompuServe. Here, you may read fast-breaking news and reviews, post messages for the editors and other users, attend live conferences, and generally participate in the creation of a new electronic magazine. Type GO FAM at any CompuServe prompt to check it out!

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# COMPUTING CLINIC

FAULTY TV DISPLAY • APPLE AND VIC MUSIC • DELETING FILES •  
APPLE IIc TECHNICAL INFORMATION • FREE COMMUNICATIONS  
SOFTWARE FOR THE 64 • A NEC AT SEA

BY JEFFREY BAIRSTOW

**When I use my computer, the first line of text is partially cut off by the top of the TV screen. Is this a problem with my computer or the TV?**

J.B. LANG  
Hockessin, Delaware

The problem is almost certainly with your TV. Some TV sets are incorrectly adjusted for the height and width of the picture. Often, this adjustment changes as the TV set ages. If your set has a vertical height control, you can make this adjustment yourself. If not, a local TV repair shop should be able to set the height and width correctly for a minimal fee.

**Where can I get a copy of the free public-domain communications program Modem, XModem, or Modem 7 for my Commodore 64? My local users' group doesn't have any information.**

J.E. JORGENSEN  
Richmond, Virginia

One place I know you can find many variations of the well-known Modem program is on CompuServe. If you're not a subscriber, ask a friend or users' group member to download the program for you.

On CompuServe, type GO CBM 310, which will bring you to the Commodore Programming SIG (Special Interest Group). Then you want to go to data base #7 (type XA 7), which is the section of the SIG for terminal programs. Once there, you can browse through many variations of the Modem program, decide which ones appeal to you, download them, and try them out.

Even if you spend an hour execut-

JEFFREY BAIRSTOW, a contributing editor, is a technical journalist. He was a founding editor of Computer Decisions, and has also taught math and computer science. His family, including two preschoolers, uses a variety of computers.

ing this task, you'll get a good program for \$6, CompuServe's hourly connect fee plus communication and prime-time surcharges. (And, while you're on CompuServe, look at the FAMILY COMPUTING ELECTRONIC EDITION. Enter GO FAM!)

**Is there an Apple IIc reference manual in print? Also, is there a book on assembly language programming and the 65C02 microprocessor that is used in the IIc?**

KAREN M. LEE  
Westbrook, Maine

The Apple IIc Reference Manual (\$50), which is not ordinarily sold with the Apple IIc, can be ordered through authorized Apple dealers. This book should give you all the necessary details about the workings of the 65C02 microprocessor, which has 65 more instructions than the regular 6502 chip used in the Apple IIc, Atari 800, and Commodore computers.

While we're not aware of a source book for assembly language programming with the 65C02, you might look at 6502 Assembly Language Programming, by Lance Leventhal (Osborne/McGraw-Hill). The \$18.95 paperback can be ordered direct by calling (800) 227-0900, or (800)772-2531 in California.

**On my VIC-20, I can make music using POKES or DATA statements. Is there any easy way to do the same on an Apple IIe?**

ANATOLY IVASYUK  
Amherst, New York

The Apple IIe can be programmed to generate sound, although not quite as well as the VIC-20 can. I don't have enough space to give you typical programs here, but I suggest you take a look at the music programs in "Home On the Range with a Computer" in the December 1984 FAMILY COMPUTING. For an introduction to music programming, look at the book Apple BASIC Made Easy, by

David and Marianne Gardner (Prentice-Hall).

If you want to explore the Apple's sound capabilities more fully, I suggest you get a copy of Apple Machine Language, by Don and Kurt Inman (Prentice-Hall).

**I am 13 and own a Commodore 64. I have a disk drive and have saved many programs on disk. The problem is, I can't find a way to erase the programs I no longer want. Is there a way?**

AMBER WHERRY  
Yakima, Washington

There certainly is a way. Put your disk in drive 0 and type the following:

```
OPEN 15,8,15
PRINT#15,"$0:FILENAME"
CLOSE 15
```

Refer to the Commodore 1541 Disk Drive User's Guide, pages 15 and 17. Substitute your file's name for FILENAME.

**I bought a NEC PC6001A at an overseas military exchange, but I can't find software or publications for my computer. Do you know of a PC6000 users' group?**

STEVE R. ABIOT  
USS Proteus  
San Francisco, California

A NEC representative says it's unlikely that there are many, if any, users' groups specifically for the PC6000, since the model is quite old, but the Boston Computer Society (the country's largest users' organization) does have a general NEC users' group. Maybe they can help. For more details, contact the BCS at: One Center Plaza, Boston, MA 02108; (617) 367-8080.

In the meantime, you might try converting TRS-80 Model III programs from the pages of FAMILY COMPUTING for your PC6000. The variants of BASIC used for the two machines are quite similar. **E**



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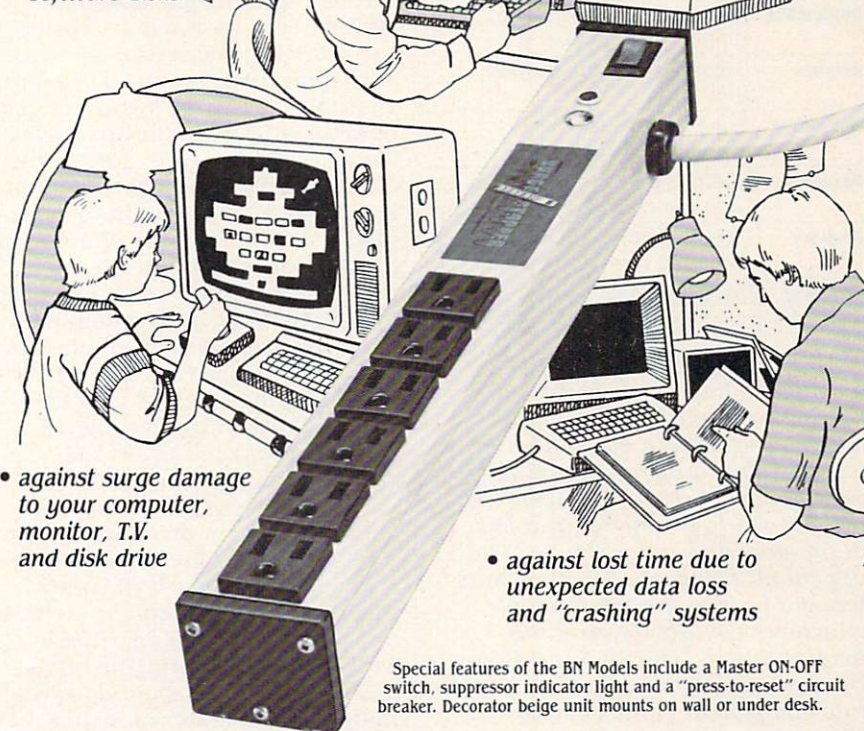
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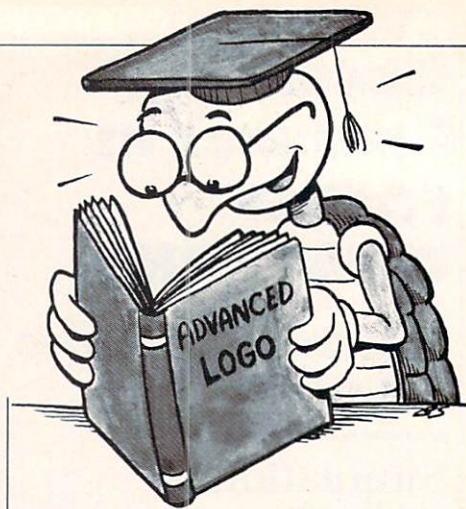


# LEARNING LOGO

## ADVANCED LOGO

### Keeping Up with Your Turtle

BY MINDY PANTIEL  
AND BECKY PETERSEN



| ISSUE     | TOPIC                                                       |
|-----------|-------------------------------------------------------------|
| September | Meeting the turtle: seven simple commands.                  |
| October   | Logo learning aids: turtle shortcuts.                       |
| November  | Teaching your turtle: debugging and saving.                 |
| December  | Adding sparkle: programming Logo colors; trying new shapes. |
| January   | Variations on a theme: changing sizes and shapes.           |
| February  | Advanced Logo: where to find out more.                      |

*This is the sixth and last article in a series on Logo, a powerful and flexible programming language with strong roots in education. Logo was developed as a tool and medium to help children "discover" the rules of math, geometry, and logic in an easy and natural way. The appeal of "discovery learning" has brought Logo to the attention of educators worldwide, and the availability of Logo for low-cost microcomputers has made it an important component of the computing curriculum in many schools.*

*Unless another dialect of Logo is specified, programs and examples in this series will run on Krell and Terrapin Logo for the Apple. Most will run on other versions of the language (and other machines) with little, if any, modification. If you have another version of Logo, we suggest you use your manual as a companion to this series, so that you can pinpoint differences where they occur.*

In five previous articles, we've taken a long look at Logo. If you've followed the series, you're now familiar with a variety of Logo commands, know how to construct and debug a procedure (one that may incorporate inputs and variables), and how to link procedures together to produce increasingly complex results. In fact, you've learned quite a lot of the ba-

sics of Logo programming—mostly through figuring out how to maneuver that ever-agreeable triangular turtle around the screen.

Though turtle graphics is a substantial and unique feature of Logo, however, it is by no means the whole language. In fact, it is quite erroneous to believe that Logo is just for kids, or is a language that is meant merely for the teaching of programming. Some experts in the field expect fully developed versions of Logo to replace BASIC as the dominant language used in microcomputers. Logo has the power to reach beyond turtle graphics to work as a true, general-purpose computing language—as capable as any other, and easier than most to learn and use.

This month we will take a look ahead to some of the advanced features that add a great deal of power to the Logo language. Of course, there is no possible way to pack the rest of Logo into a single article—we'll be providing only the briefest of introductions and avoiding specifics that would be more confusing than helpful at this stage.

You already know about Logo's terrific graphics capabilities. Now, for the first time, you'll see how Logo

handles numbers and words—two very important aspects of any higher-level programming language. We'll also show you how Logo programs can make decisions and respond to the user in various ways.

Before we get into a more in-depth discussion of what these advanced capabilities are about, take a look at this sample output from a simple Logo program that puts some of these number and word capabilities to work:

```
GREG HAD 10 BALLOONS
HE BOUGHT 5
HOW MANY DID HE HAVE THEN?
15
RIGHT!
```

This is called an interactive program because it invites the user to "interact" with the computer—answering the math story problems that the computer generates. For the first time, you are seeing a Logo program that puts words together in sentences, asks questions, calculates answers, and even responds to answers that are given. This is only

## SOME HELP FOR LITTLE ONES

Here is a helpful program to use with very young children or those who have difficulty with keyboard entry. The following program causes the turtle to move and draw in response to individual keystrokes: "F" for forward, "L" for left, "R" for right, and "C" for clearing the screen and starting over.

```
TO SCRIBBLE
PR [PRESS <F>, <R>, <L>, OR <C>]
MAKE "KEYPRESS RC
IF :KEYPRESS = "F THEN FD 20
IF :KEYPRESS = "R THEN RT 30
IF :KEYPRESS = "L THEN LT 30
IF :KEYPRESS = "C THEN HOME CS
SCRIBBLE
END
```

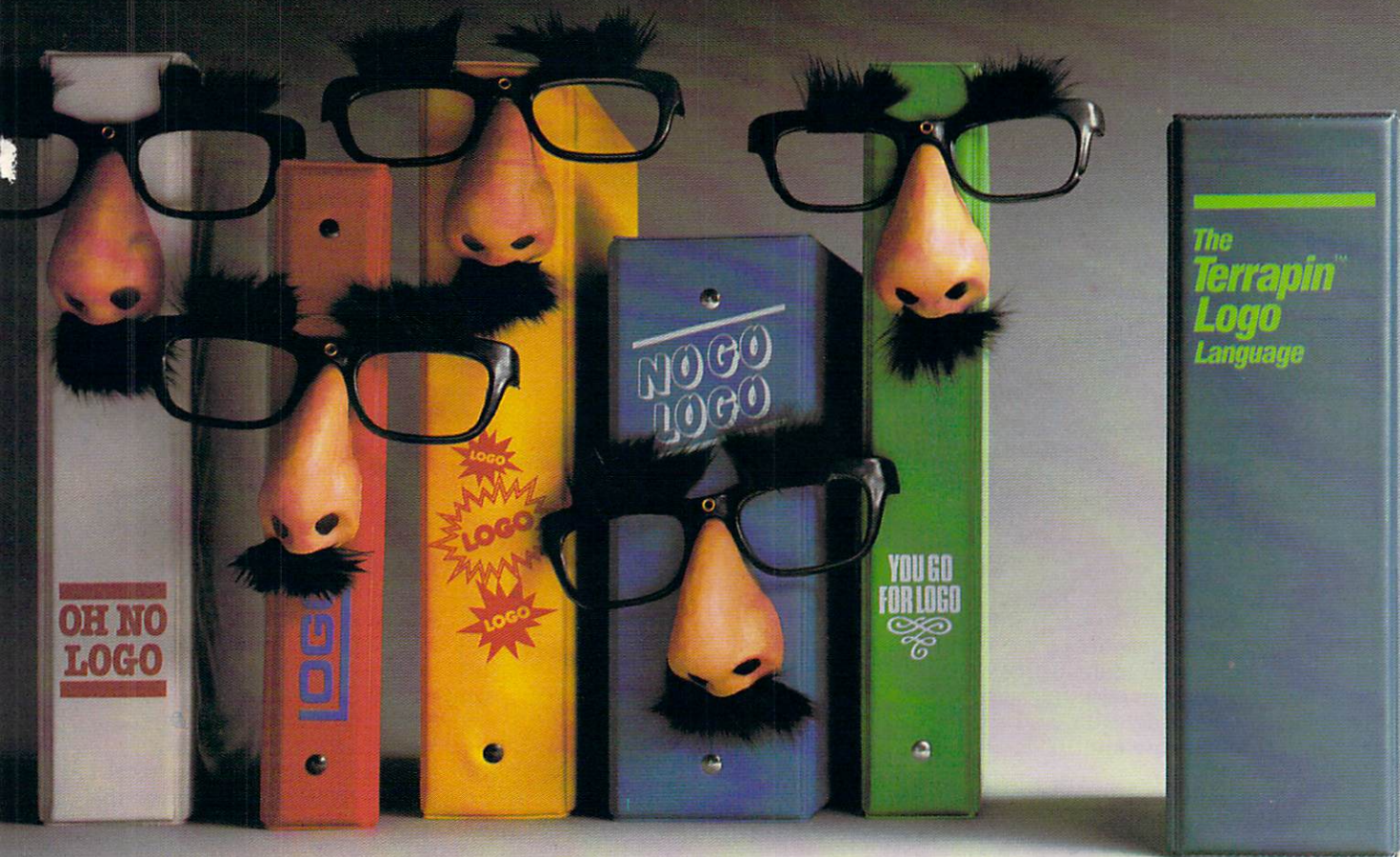
When you execute SCRIBBLE, the

procedure clears the text screen and prints a prompt informing the user which keys to press. Then the procedure uses the RC (for READ CHARACTER) command to take a single character of input from the user. Using the MAKE command, it places this character in a variable called KEYPRESS. It then tests KEYPRESS to see if it represents F, R, L, or C, and acts accordingly. Finally, the procedure calls itself, repeating the process and waiting for another keypress.

This procedure can make it much easier for the youngest members of the family to begin turtle graphics without first having to memorize lots of commands and understand the functions of numeric input.

MINDY PANTIEL and BECKY PETERSEN of Niwot, Colorado, are contributing editors to FAMILY COMPUTING and authors of Kids, Teachers, and Computers, published recently by Prentice-Hall.





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There are Terrapin Logo versions for the Apple II family of microcomputers (with 64K RAM) and the Commodore 64 and Plus 4. Terrapin Logo is a registered trademark of Terrapin, Inc. Apple is a registered trademark of Apple Computer, Inc. Commodore and VIC are registered trademarks of Commodore Electronics, Ltd.



# LEARNING LOGO

one example of what can lie beyond turtle graphics. Now, on to some explanations.

## LOGO MATH

Like other computer languages, Logo is very good for math. Try entering the following expressions, and see if you come up with the responses shown:

PR 5 + 7

12

PR 5 - 3

2

PR 10 / 5

2

PR 10 \* 10

100

Notice that the command PR (short for PRINT) is used to make the results of the computations visible on the screen. Note also that like most computer languages, Logo uses the slash mark (/) to indicate division, and the asterisk (\*) to indicate multiplication.

In the interactive Logo program with output shown above, the computer used its math capabilities to calculate the answer to  $10 + 5$  and check it against the user's answer. Besides addition, subtraction, multiplication, and division, most versions of Logo also offer a large number of more sophisticated mathematical functions—capabilities sure to interest high-school and college students and the more mathematically inclined members of your family.

## WHAT'S THE GOOD WORD?

Logo also offers many ways of handling text. The simplest application of Logo's text-handling capabilities is the use of the PR command to display a message on the screen. When a single word is to be displayed, you precede it with a quotation mark. If there's more than one word in your message, you enclose the text in square brackets:

PR "HELLO

HELLO

PR [WHAT'S YOUR NAME?]

WHAT'S YOUR NAME?

Logo can combine elements of text via such advanced commands as WORD and SE (SENTENCE):

PR WORD "PARTNER "SHIP  
PARTNERSHIP

PR (SE [PARTNERSHIP] [IS] [WONDERFUL])  
PARTNERSHIP IS WONDERFUL

Logo also can handle masses of text or groups of numbers. Logo's approach to groupings of information is based on the concept of creating lists. A Logo list consists of

## FOR FURTHER REFERENCE

The Young Peoples' Logo Association serves as a clearinghouse for information about Logo products, literature, and other materials. Its *Logo Library* is a compendium of reviews, abstracts, and listings, available for \$7.95 from:

Young Peoples' Logo Association  
P.O. Box 855067  
Richardson, TX 75085

YPLA also maintains a bulletin board featuring a continually updated electronic edition of *Logo Library*. If you own a modem, you can access this service between 7:00 p.m. and 9:00 a.m. weekdays (Central Time) or any time on weekends by calling (214) 783-7548. Subscriptions to *Turtle News*, the YPLA newsletter, are available for \$25/year. Group and club subscriptions are half price.

The National Logo Exchange (P.O. Box 5341, Charlottesville, VA 22905) also publishes a newsletter. Subscription rates are \$25/year. NLE also maintains comprehensive lists and bibliographies of Logo literature and materials.

words or numbers (or combinations of both) separated by spaces and enclosed in square brackets. Here are two examples of simple Logo lists:

[2 4 6 8 10]

[THIS IS A LIST OF WORDS]

Logo has commands and functions that let you create lists from many separate elements and then manipulate these lists in different ways. There are commands in Logo that let you take elements out of a list one by one, sort lists by different criteria and count their elements, or search through lists for particular items. Taken together, these capabilities give the advanced Logo programmer considerable freedom in writing programs that handle quantities of information. Data bases are only one example of the many kinds of programs Logo list processing lends itself to.

## GIVE IT SOME INPUT

Most versions of Logo incorporate a wide variety of commands that let procedures interact with the outside world. The following sample procedure asks that the user type in his or her name, and then responds by printing a personalized greeting on the screen. It uses the RQ (for REQUEST) command, which captures a list of words entered at the keyboard. It also uses another com-

mand we haven't covered: MAKE, which assigns the captured list of words to the variable FRIEND.

TO MEET

PR [PLEASE TYPE IN YOUR NAME AND PRESS <RETURN>.]

PR [WHAT IS YOUR NAME?]

MAKE "FRIEND RQ

PR SE [PLEASSED TO MEET YOU. ] :FRIEND  
END

PLEASE TYPE IN YOUR NAME AND PRESS RETURN.

WHAT IS YOUR NAME?

BECKY PETERSEN

PLEASSED TO MEET YOU. BECKY PETERSEN

## DECIDE AND CONQUER

Logo also offers commands that let procedures make simple decisions. The most basic of these commands is IF. IF is used with two inputs: a conditional expression (often called a predicate) and a list of instructions to perform if the condition proves true. The following procedure uses an IF clause to respond appropriately to a statement entered by the user:

TO CONGRATULATE

PR [DO YOU KNOW LOGO?]

MAKE "ANSWER FIRST RQ

IF :ANSWER = "YES THEN PR [THAT'S WONDERFUL!]

IF :ANSWER = "NO THEN PR [YOU SHOULD STUDY HARDER!]

END

DO YOU KNOW LOGO?

YES

THAT'S WONDERFUL!


DO YOU KNOW LOGO?

NO

YOU SHOULD STUDY HARDER!

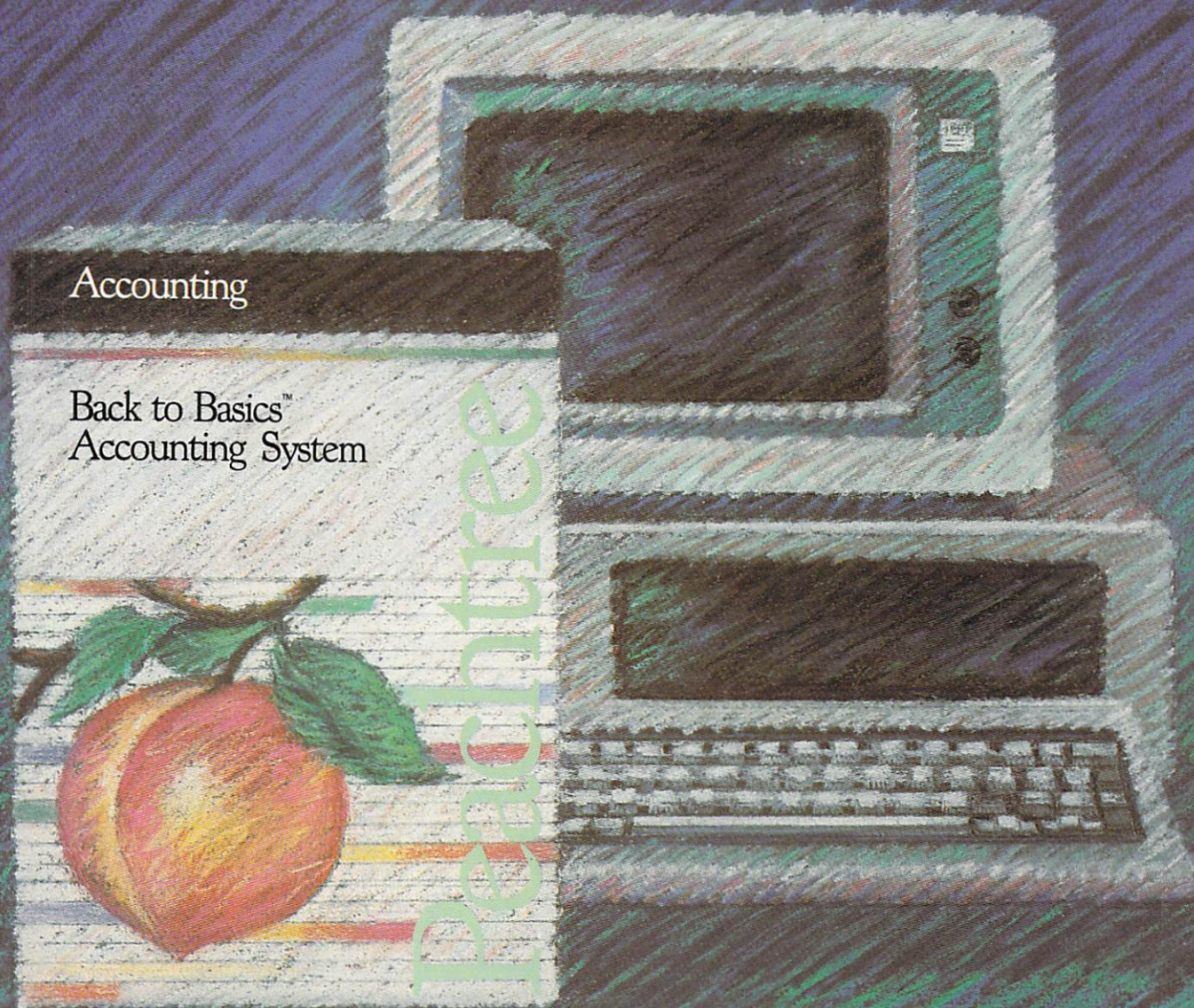
## THE LEARNING NEVER ENDS

It'll probably take you a while, and a good deal of users' manual-thumb-ing, to become familiar with the more advanced features of Logo. There's still a lot of material we haven't touched on—features such as music generation, sprite graphics, and interaction with disks, printers, and other peripherals. These features tend to differ from one version of Logo to another.

We hope we have given you enough information to whet your appetite for making the learning of Logo a family affair. To aid in your search for further information, see our short list of selected literature and the addresses of major Logo groups and organizations. We hope you'll find them useful in your continuing exploration of this fascinating language. 



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## MIMIC

FOR INFORMATION WRITE:

MIMIC SYSTEMS INC.  
1112 FORT ST., FL. 6G  
VICTORIA, B.C.  
CANADA V8V 4V2

To Order Call:

**1-800-MODULAR**  
(663-8527)



# A Step-by-Step Guide to the Care and Maintenance of Your Computer



## HOW TO KEEP YOUR SYSTEM IN TIP-TOP SHAPE

**BY JACQUELINE AUSTIN**

What's your worst computer nightmare? Is it the one in which you feed in all your income-tax data for the past 10 years, plus your personal telephone directory, only to have the entire system go "@#S\*&"? How about the one in which you are instructed to mail your

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computer, plus all your peripherals, back to the manufacturer for troubleshooting and repair, so that you can wait two months and shell out \$300, only to discover that the problem was . . . one loose screw?

Disasters can happen—and do—to thousands of computer owners. Your turn is sure to come. That keyboard and disk drive, for example, have a probable life of one or two years

of heavy use before needing repair. And, if members of your family have been snacking, smoking, or stroking Fido near the computer, some sort of misfortune is a lot more likely.

Don't despair. You can be prepared. When any computer failure occurs, you won't be pleased, of course. But if you've taken precautions and know how to deal with trouble, it will certainly take less time to get that



system humming again.

What does it take? Careful planning and a few relatively simple routines. You'll have to be on more than nodding terms with your computer manufacturer, too—you'll use those customer service numbers. Many of the companies can connect you with experienced technicians. And, you'll ask a lot of questions of other users.

## HOME REMEDIES

In the event of a breakdown, don't rush to the repair shop. Repairs can take much less time if you've already isolated the problem, or at least confined the possibilities to one part of the system. One Apple user had her computer's keyboard repaired six times before she herself discovered, by carefully examining the circuitry, that one little wire

had a kink in it. There are things even the least experienced owner can fix. But, it's also important to know your limitations and never attempt to delve into parts of a computer's circuitry that you don't know enough about.

Diagnostic disks, which help to pinpoint the troubled area of your computer system, are good for getting a rough idea of the prob-

lem. They can be expensive—from \$40 to \$150—but they can save you a lot of time. Ask your dealer to recommend the proper disk for your machine.

Most of the manuals that come with computers are short on information about maintenance and repair. To supplement, you may wish to invest in a more detailed repair guide, available at your bookstore or through

# A MASTER PLAN FOR A HEALTHY COMPUTER

## 1 Start with a Checklist

If you arrange a sensible setup and establish a workable routine, you'll already have eliminated plenty of potential problems!

## A AT SETUP

1. Send in your warranty card. Many companies tell their customers about glitches that are later discovered in the equipment. If you don't register as an owner, the company will never know how to contact you.

2. Store the original packaging. You'll need that carton when it's time to carry or mail in the computer for repair.

3. Read your manual carefully. Most manuals say little about maintenance, so many people tend to ignore them, but if you follow their advice at setup, you'll avoid a lot of problems.

4. If the manual isn't clear, call the manufacturer for advice (see customer service numbers in accompanying box).

5. Be careful where you place your computer. If you

put the disk drive too close to the monitor, you may get disk input-output errors; if the computer's too close to your TV, it might cause interference.

6. Some experts recommend "burning in" your computer—turning it on and leaving it on for 48 hours. This uses very little electricity, and may catch defects.

## B IN THE FIRST WEEK OR TWO

1. Join a users' group. Experienced users often know the ins and outs of a computer even better than the manufacturer! (To find the group nearest you, or read about how to start one of your own, see the article on users' groups in this issue.)

2. Buy or make lint-free dust covers. (Old sheets are fine.)

3. Invest in antistatic mats or, at the very least, antistatic cleaning spray or fluid; use regularly.

4. When lightning strikes, your computer can become a very expensive paperweight. Buy a surge protector as a safeguard against sudden bursts of voltage. The cost ranges from \$10 to \$100. Look for such features as response speed, capacity, and the ability to handle repeated sharp stresses.

5. Consider buying or building a cooling fan to help prevent overheating.

6. Start a journal/file to jot down symptoms, phone numbers, dates, actions, and names of helpful (or unhelpful) service personnel. This might seem premature, but if you've bought a lemon, you'll need incontrovertible evidence!

## C BEFORE YOUR WARRANTY EXPIRES

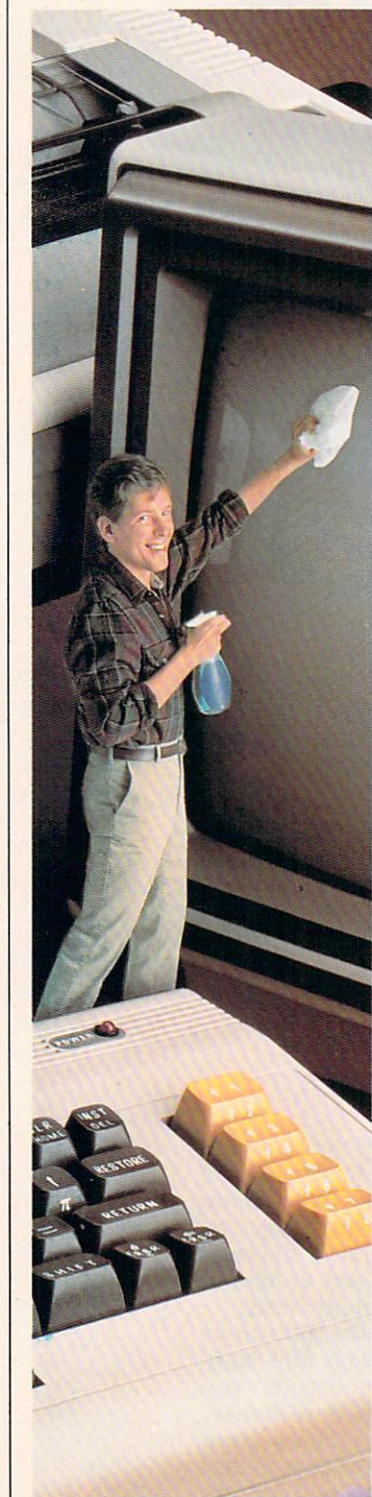
1. Check each piece of equipment to see that it can do everything it should be able to do. Program a long, repetitive job, and print it out. Leave the computer on for a day or two. Your monitor is relatively easy to check: Fill a screen with M's. How's the focus? The resolution? Are the horizontal and vertical lines of M's straight?

2. Get a general repair guide. (Henry Beechhold's *The Plain English Repair and Maintenance Guide for Home Computers*, published by Simon & Schuster, is an excellent choice—it even includes a coupon for free advice on a repair.)

3. Use your computer heavily during the warranty period.

4. If anything seems odd—or if you have any questions—take the computer to your dealer for a check-up at least a month before your warranty expires.

5. Don't ever leave the same "screen" of type sitting on your monitor for an extended period of time; it may become permanently "etched" in the screen. (Also, if you're using a computer intermittently, but often, throughout the day, spare its electrical system by leaving the computer on throughout. This puts less of a strain on the system than turning it off and on





your computer's manufacturer.

## AVOIDING ANXIETY

How do you keep your computer happy? It isn't as complicated as you may think. In this article, we recommend some of the ways you can help ensure a long, healthy, happy life together with your computer. How much work it takes depends on how much you

rely on your computer, the type of system you own, and how far you live from the nearest carry-in service. But, most of your routine will focus on keeping your work area clean. Dust is the one thing that destroys most keyboards, disk drives, and printers before their time. You don't have to spit-polish the floors like Great Aunt Emma did, but you do need to keep your

computer system and the surrounding work area clean.

The key ideas for computer care are: some sort of preventive maintenance to extend the life of your computer's mechanical components; finding the right repairpeople *before* you have an emergency; and prompt isolation and repair of any symptoms. The following master plan

will give you a good list of routines to set up, including an overall checklist, a regular housekeeping routine, and a "first-aid" plan for emergencies. Then, we'll detail some of the specific service information you should know, brand by brand. And finally, we provide a handy list of phone numbers you can't afford to be without. Happy computing!

each time. But do turn down the brightness control of your monitor as low as it will go, except when you're reading a screen.)

**6.** Consider a service contract if you intend to use the computer heavily after the warranty expires. (For information see accompanying article on next page.)

**7.** Find a competent repair person. That way, when your computer breaks, you won't have to entrust it to a stranger. One of the best ways to find someone is to get a referral from your local users' group. You might also get a referral from your manufacturer through its customer service network.

## 2 Have a House-keeping Routine

This list of suggestions is somewhere between hurried tidying and spit-and-polish shining. Adjust the routine if it doesn't suit you. The important point is to have some routine.

## A EVERY FEW USES/ONCE A WEEK

**1.** Clean keyboard with a can of compressed air, or, if you vacuum cleaner has a small, soft brush attachment, vacuum the keyboard.

**2.** Vacuum computer area.

**3.** Wipe monitor screen with an antistatic or glass cleaner.

**4.** Wipe cabinets and casings.

**5.** If you have no antistatic mat under your computer, wipe the floor with the cloth you used to wipe

off the monitor, or use a special antistatic spray.

**6.** Vacuum all openings in the computer's shell: ports, cable outlets, seams in casing, exterior of disk drives, back panel, etc.

## B EVERY MONTH OR TWO

**1.** Shine a light on the ink-catching surfaces of your printer. If they are dirty, clean carefully with whatever cleaner your dealer recommends. (Often, the best cleaner is rubbing alcohol.) Vacuum and clean areas around the ribbon and platen, daisy-wheels, and any mechanical parts. *Important:* Before cleaning with any liquid, turn off and unplug computer; and always check before cleaning to see if part is lubricated! Relubricate after cleaning.

**2.** Clean your dust covers.

**3.** Inspect ports, disk drive(s), and printer for signs of dirt and wear.

## C EVERY SIX MONTHS

**1.** If your dealer recommends it, clean disk-drive heads with a cleaning disk. Or use one of the cleaning routines outlined in Beech-holds' guidebook. *Warning:* There is a good deal of controversy about the wisdom of maintaining a disk drive yourself. Some users swear by using cleaning disk kits, saying they're convenient and do a great job of preventing debris from building up inside the drive. Others say such kits are expensive and can damage the heads if used too frequently.

**2.** Clean line connectors—plugs and sockets—with alcohol.

## 3 Set up an Emergency First-Aid Plan

Don't panic! It's probably not as serious as it first appears.

## A IN YOUR FIRST MOMENTS OF SHOCK AND HORROR:

**1.** Turn off the computer and give it—and you—a rest for awhile. It's possible that both of you are overheated and that the problem will self-correct in a few hours.

**2.** Inspect the plugs, pins, and electric connections/fuses. Heathkit, the manufacturer of customer-assembled computers, estimates that 85 percent of all problems are caused by bad soldering connections.

**3.** Inspect the screws and mechanical connections.

## B WHEN YOU HAVE YOUR SECOND THOUGHTS:

**1.** Call the customer service numbers listed on the next page and ask technicians to help you isolate the trouble.

**2.** Run a diagnostic disk; it often can give you a good idea of where the problem is located.

**3.** Call your users' group and repairperson for advice.

**4.** You often can isolate the problem by swapping peripherals, circuit cards, cables, etc. with another user. For example, if a friend's disk drive works perfectly well with your computer, but the problem still

exists when you hook up your disk drive, chances are it's the drive, or maybe a connection—not the computer.

**5.** There are ways to save a tape or disk you think has been erased or damaged. So, if the ultimate disaster has happened, make a few telephone calls before throwing away that cherished piece of software!

## C WHEN YOU'RE READY TO ACT:

**1.** Open the computer (don't do this if your warranty's still good, unless you own an Apple II plus or IIe or know *exactly* what you're doing!). Use a can of compressed air to blow away any dirt from the interior. Check the soldering for weak connections.

**2.** If you're stumped, and ready to go for outside help, pack the computer carefully in its original shipping material. Do this whether you're carrying or mailing it in for repair. Remember, malfunctions caused by customer negligence are not covered under warranty. Check with your manufacturer about freight charges, shipping, and estimated time for repair.

**3.** Don't let the computer out of your hands until you know exactly what the repair process will entail. If you can, get a written estimate, both for cost and time. Make sure to double-check the address before mailing off your precious cargo. (And if you're fond of your equipment, maybe you should insure it before shipping it.)

**4.** If the repair process is going to be lengthy, or if the necessary replacement parts are out of stock, ask the repairperson to lend you another computer.



# A GUIDE TO YOUR COMPUTER'S SPECIAL SERVICE NEEDS



Since January 1984, Honeywell has been servicing the ADAM. Forty centers opened during the year and there are more to follow; each has state-of-the-art equipment and highly trained personnel. (Call your local branch of Honeywell for information.) At ADAM's toll-free number, listed in the accompanying box, you'll reach technicians who can help you to isolate any problems with your system. For further help, consult *Adam's Companion*, by Ramsey J. Benson and Jack B. Rochester, published by Avon Books.

## APPLE

There are general guidelines for computer care and maintenance that apply to all different types of machines. Yet, every system has its special features, and each computer manufacturer has its own policies for care and repair. The following guide will help direct you to some of the specific information you'll need for your brand of computer.

## ADAM

Take extra care with disks and data packs if you have an ADAM. Don't leave software on top of the printer, because it emits strong magnetic fields that can harm your programs. In fact, don't put the monitor on top of the rest of the unit; it wasn't built to take the pressure and won't be shielded from the magnetic field. Be sure to remove data packs from the drive after use—and never turn the machine on or off with a data pack in the drive! Coleco says many people have ruined their data packs by doing that—but also says that some data packs that aren't working properly are easy to fix. According to the manufacturer, customers should take a troublesome data pack out of its case and tap it a couple of times on each side against a hard surface such as a tabletop.

Apples tend to be reliable, and the AppleCare service contract and policies are some of the most complete in the business. Authorized dealers—there are about 2,000—keep a complete parts kit on the shelves; they are specially trained by the company in a stringent repair procedure. Apple claims that 60 to 80 percent of all carry-in repairs are completed within 24 hours. The dealers can insert a new part and send the old, malfunctioning part to a huge center in Dallas for reconditioning.

Most complaints are about electromechanical components. And, the company's policy of refusing to sell parts or service manuals directly to its customers is oppressive and inconvenient. If you have an Apple, get to know your authorized repair person. And, call an Apple End-User Technical Support number (see box) if there's any extended problem with or delay in service—Apple says it wants to know.

## ATARI

This corporation has undergone tremendous changes since its takeover last July by former Commodore chief Jack Tramiel. The problems that plagued Atari before and during the ownership transition—including poor computer repair ser-

vice—are rapidly diminishing. Most notably, Atari is beefing up support and information for its 1,500 service centers.

If your malfunctioning computer and peripherals are under the 90-day warranty, you can exchange them at the place of purchase. After that, most repairs will be handled at local Atari service centers. You can find the one nearest you by calling the customer ser-

vice number: (408) 745-4851. Repairs that can't be handled by the local center can go to Atari's main factory in California: 390 Caribbean Drive, Sunnyvale, CA 94089.

## COMMODORE

C 64s and Commodore disk drives originally had a high defect rate; this has now improved. The company has one of the largest and

## REACH OUT AND ASK SOMEONE!

When your computer gets sick and you don't know who to call, these are the first numbers to try, and luckily, plenty of them are toll-free! They are "authorized" listings provided by manufacturers to guide distressed owners through the maze of conflicting recommendations and regulations. There's a whole range of service personnel—some are helpful, others aren't. It's best if you have specific questions.

**ATARI:** The customer service number is (408) 745-4851. Atari has approximately 1,500 service centers around the country. Check your local phone book for the location nearest you.

**APPLE:** Call (800) 538-9696 for the address of your local authorized repair center. If that doesn't work out, try the End-User Technical Support number closest to you.

**Boston area:**  
(617) 481-8101  
**Charlotte, North Carolina:**  
(704) 527-6170

**Chicago area:**  
(312) 577-4102

**Dallas area:**  
(214) 245-0228

**Ontario, Canada:**  
(416) 444-6803

**Southern California:**  
(714) 660-1898

**Northern California:**  
(408) 745-6731

Apple's main offices are located at 20525 Mariani Ave., Cupertino, CA 95014.

**COLECO:** Call (800) 842-1225; in Canada, call (800) 361-2122. Supplies, including a pamphlet on checking your system and troubleshooting, are available from Coleco, 999 Quaker Lane S., West Hartford, CT 06110.

**COMMODORE:** Try (800) 441-5999 for service informa-

tion, or contact the manufacturer's service center that is closest to you: 1200 Wilson Drive, Box 11, West Chester, PA 19380; (215) 431-9100; or Commodore Business Machines, Midwest Region, 2246 N. Palmer Drive, Schaumburg, IL 60195; (312) 397-0075.

**IBM:** Call (800) 426-3333 for general information. For info on service contracts and supplies, call (800) IBM-2468 (ask for Systems Product Division). Also, check your phone book under IBM Product Centers.

**TANDY/RADIO SHACK:** Call (800) 433-5502 for contract service. For technical information, try (817) 338-2392 (hardware, large computers including the TRS-80 Models I-16); (817) 338-2393 (hardware, small machines such as the CoCo and Model 100); (817) 338-2395 ("home" software); or (817) 338-2396 (educational software). The main offices are at 1800 One Tandy Center, Fort Worth, TX 76102.

**TEXAS INSTRUMENTS:** If you call the Home Computer Service Information number, (800) 842-2737, you'll get the address of the service center located closest to you. For more information, try the TI Response Center at (800) 842-3200.

If you bought your computer through Triton, you can get service information at its toll-free number: (800) 227-6900.

**TIMEX:** There is no toll-free number. The number for the one authorized repair center in Little Rock, Arkansas, is (501) 370-0534. You can get service information at the Timex headquarters in Waterbury, Connecticut: (203) 370-6936.



best support systems in the business, including a link-up to CompuServe, which lists user questions, dealers, technical tips, etc. Many local Commodore dealers offer reasonably priced service contracts.

Owners of malfunctioning machines should send the computer to Commodore (see box for address), along with a service fee (\$55 for C 64, \$35 for VIC-20) and a letter describing the problem. The company will either replace or repair parts.

## IBM

IBM says it doesn't want to know about your system (in general) if it contains anything of non-IBM manufacture. On IBM products, however, the corporation offers extremely complete, if somewhat pricey, warranty options or annual maintenance agreements. Call (800) IBM-2468 for info.

A diagnostic disk comes with the computer. IBM also sells exquisite (and expensive) dust covers, cleaning disks, sprays, and antistatic cleaners—almost everything the user could desire.

If your system mixes IBM and non-IBM parts, you'll have to do some comparative shopping for service. Try IBM Product Centers, Sears, or Computerland, as well as third-party vendors. Prices and terms vary, so keep checking. For example, Sears will only service those parts you bought at that specific store. Computerland will do repairs on all parts of your IBM system, whether or not the part was purchased there. They'll do it at the store or come to you.

## TANDY/RADIO SHACK

With almost 9,000 outlets worldwide, Tandy/Radio Shack should offer good, prompt service. User reports, of course, vary: Some say they got excellent, swift repairs, while others had to go back to the store again and again. Troubleshooting is handled on the level of individual electronic parts, as opposed to isolating and replacing the entire computer, peripheral, or section of a system. This is a policy that sometimes takes longer than you may like—but if you have no service contract (and many Radio Shack users don't), replacing one

component can be cheaper than replacing a piece of the system.

Service contracts are offered for the whole Tandy line. You have a choice of two types: a carry-in contract and a full on-site contract, which includes visits from repair personnel to your home or office. In fact, even if you don't have a service contract, you can arrange to have a Tandy repair person come to you.

## SHOPPING FOR A SERVICE CONTRACT

If you, or anyone in your family, are serious about computing, you should consider getting a service contract. With one of these useful agreements, you can have a broken computer up and running before any resident hackers develop glazed eyes and twitchy fingers.

You can get a contract through your computer dealer, an independent service center, or a third-party maintenance firm. Third-party maintenance can cost a bundle, but you usually get lightning-quick service calls (a two- to four-hour repair is average)—a plus if you're working on an important job. Dealer service is less expensive, but you usually have to carry the computer into the store. Service through an independent shop might be your best choice if the local authorized repair person is 100 miles away, while an electronics whiz is in the very next town.

Both Apple and IBM have standard contracts that set a flat rate per piece of equipment covered (IBM's prices vary widely, so shop around). Tandy/Radio Shack offers a full range of contracts, and charges 12 percent of the purchase price per year for carry-ins, 20 percent for on-site repair. An extra charge is tacked on if the technician has to travel more than 50 miles to your home or office.

Many discount stores both sell and service computers, so be sure to ask what arrangements can be made. And, if you're shopping for a computer, consider signing the contract at the same time—you may get a better deal.

## TI-99/4A

At first, users complained about defects in the electrical system; later, there was a range of new complaints. The TI-99/4A system was discontinued and the inventory sold to Triton Products.

To the manufacturer's credit, it still maintains a viable hot line and repair network to help serve the two million TI-99/4As out there. Call customer service to get

Before you sign a service contract, read it carefully! The details should suit you—and what you and your computer need. Here are some of the things to look for:

**TERM OF AGREEMENT:** The dates service is in effect.

**CHARGES:** A charge of 12 to 20 percent of the purchase price per year, like Radio Shack's policy, is considered fair.

**TIME OF RESPONSE:** Likely to be a day or less.

**SHIPPING CHARGES:** Usually you have to ship the computer prepaid, in its original packaging, at your expense. The service company should pay for shipping the computer back to you.

**SCOPE OF SERVICE/EXCLUSIONS:** Make sure you know which repairs the contract covers!

**TIME AND MATERIALS SERVICE:** If the repair isn't covered by ordinary service, how much will you be charged for labor? Will the service company give you parts at its cost, or is it entitled to tack on an extra charge for handling?

**EMERGENCIES/LOANERS:** If your computer crashes in the middle of a very urgent piece of business, will the service company lend you another computer? Will it allow you to come to one of its stores and use equipment there? If the repair takes longer than specified, or you have to wait for a part, will the company replace your computer during the delay?

Remember: Most contracts are negotiable. You don't have to accept the printed contract *carte blanche*; you may wish to add or delete sections to fit your needs. Ask a lot of questions, and be sure to get everything you need in writing.

help from one of the 35 to 40 operators. If they can't answer all your questions, you can get friendly, competent advice from one of the five technicians Texas Instruments keeps on the job.

If the problem isn't simple, the technician will refer you to the Customer Service Center closest to you. For a maximum of \$28.25—a lot cheaper than most parts and labor—you can get a reconditioned TI-99/4A with a six-month limited warranty. If your computer is under warranty, you can bring it to one of nearly 50 service centers nationwide, or you can mail it to the main facility: P.O. Box 53, Lubbock, TX 79408. You'll be charged up to \$7 for service, and you will have to pay for shipping. (You always do, whatever computer brand you own.)

## TIMEX SINCLAIR

Although this company is out of the computer business, it still services its products and honors its warranties. Unfortunately, there is only one customer service/repair center in the country, in Little Rock, Arkansas, which also fields technical questions. You need to do your best to figure out what the problem is, then you call the service center. As soon as they determine that the problem is the machine, not the user, you can send them your computer. Then they send you an estimate and if you decide it's worth the money, you send a check and they fix your computer. Once they receive your payment, it usually takes about a week for Timex to send (via UPS) your computer back.

Under the circumstances, it may be worth the effort to try to repair your computer on your own. For \$2.50 you can get schematics on all three models: the 1000, 1500, and 2068. From then on, however, the going gets rough: There is no technical manual for the 1000; the 350-page manual for the 2068 costs \$25 (note: the maximum fee the service center will charge for repair on the 2068 is \$30); no parts are available; and no information is offered on the printer. Our advice? Talk to your repairperson about obtaining replacement parts, buy a general repair guide, join a users' group, and keep the computer spotless. **F**





Dan Cook, the computer whiz of Harlem Hospital, where he works.

# Home, School, & Work

BY KEN COACH



THREE GENERATIONS OF THE COOK FAMILY USE THEIR HOME-GROWN COMPUTER SKILLS AT WORK AND SCHOOL

**T**he Cook family doesn't consist of just one computer generation; it has three. The computer, which Dan and Marion Cook initially bought as a challenge for their 5-year-old daughter, soon captured the imagination of her parents and grandmother. All three now use computers extensively in their work.

For the three adults, and daughter Dara, the computer has had a direct and measurable effect on their jobs and schoolwork—and improved their possibilities for the future.

When Dan Cook, 40, bought a 16K TRS-80 Model III computer four years ago, his main concern was that his daughter Dara get a good head start in school. She had just enrolled in first grade in her hometown of Tuckahoe, New York (outside New York City). Dan didn't have much faith in the public-school system, and felt he had to make a choice about his daughter's education: Send her to a private school or buy her a computer. A computer was the less expensive of the two options.

## MIDNIGHT OIL

But Dan knew nothing about computers. So he set out to familiarize himself with the computer to pave the way for Dara. "Programming wasn't difficult, even at the start," says Dan, who works as an associate director of ambulatory care services at Harlem Hospital in New York City. "It was just a matter of spending the time."

He burned a few months of midnight oil, pounding the computer keyboard until 5 a.m. and dragging himself out of bed at 8 a.m. to go to work. He spent hours typing in programs from books or magazines. He'd study what other people had done, then try modifications to learn how specific BASIC commands and statements worked.

Once he had a handle on the computer and the BASIC language, Dan reviewed Dara's textbooks and began to develop what he calls "study modules." Working with existing software, often a general data-base program, he would adapt it to his daughter's needs—by personalizing it with Dara's name, or adding an assortment of verbal and graphic rewards, incentives, and reprimands.

Whether this computer training was fully or partly responsible for Dara's success is moot—it certainly did no harm. Dara skipped second grade, moving from first to third.

Satisfied that his daughter's computer education and schooling were off to a good start, Dan focused his newly acquired computer knowledge on his job at the hospital.

The hospital was using a mainframe computer to move mountains of paperwork, but didn't use computers for anything directly related to patient care. "The mainframe could tell how many bills a patient had paid in the last six months, but had no idea what kind of medication he or she was on," says Dan.

Other computer applications were being



handled by an outside contractor. Dan realized much of that work could be handled by microcomputers in-house. At first, hospital administrators resisted, but Dan finally convinced them that a micro was more than a "toy." The results were astounding.

Since obtaining and using microcomputers, the hospital's outside computer-service bill has been cut from \$130,000 to \$28,000 a year!

In his own specific area of responsibility at the hospital, Dan envisioned another use for computers. Until recently, he directed the drug-abuse program, which attempts to rehabilitate hardened drug addicts. "My patients are the ones folks at home have nightmares about. They are hard-core drug fiends and anything you can do to divert them is saving somebody's pocketbook."

Now, some of them are learning how to use a computer. Of course, convincing city and state officials to buy computers for a group of drug addicts was not easy. Finally, the hospital decided that fees collected from patients during a three-month period could be used to purchase the needed equipment.

When \$11,000 was collected, nine TRS-80 Model III computers and a printer were ordered. The outpatient program now has 17 microcomputers, seven of which are used exclusively in the drug-abuse program for education.

Most of the former addicts who use computers are more interested in educational programs than in games. The sense of accomplishment that a computer can bring them is having a positive effect and, according to Dan, is reducing the potential for addicts to commit crimes.

### MARION'S STORY

Marion Cook, who at first resented the time Dan spent with the computer, saw what was happening at the hospital and thought she could effect similar changes in her job as a schoolteacher. She teaches fifth grade at P.S. 86 in the Bronx, New York.

About a year after the computer entered the Cook household, Marion started taking local computer-education courses. Six classes later, she, too, was ready to bring her skills back to the workplace.

Marion's familiarity with the computer enhanced her working credentials. She's now the school's computer instructor, teaching Logo and BASIC to regular classes, and a computer-literacy class to fourth- through sixth-grade computer clubs that meet once a week.

P.S. 86 now has a dozen or so computers, shared among 1,300 students. Although that's a far-from-ideal situation, Marion thinks the presence of computers has already made a world of difference to both teachers and students. She says the computer's graphics, for example, are more motivating to students than are conventional teaching materials.



"At home, Dan wants me to do more with the computer, like catalog my coupons, but I really don't," confesses Marion. "Dan still does the programs for Dara's homework. When I use the computer at home, I'm doing my own homework for school!"

*Marion Cook in front of P.S. 86 in the Bronx, New York, where she teaches Logo, BASIC, and computer literacy.*

### THE TRUE "WIZ"

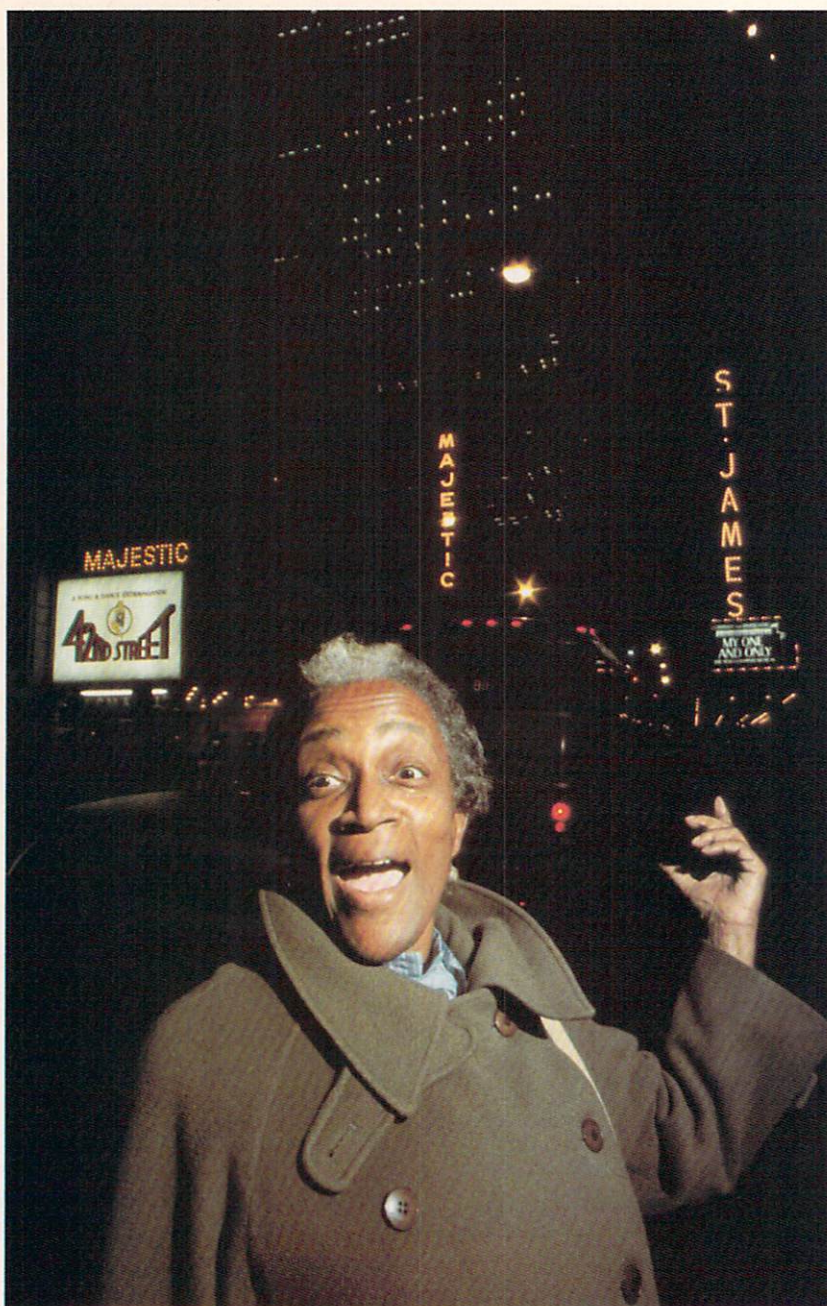
Catherine Cook, 64, Dan's mother and Dara's grandmother, has been involved in Broadway theater for 10 years. She began as the executive secretary for producer Melvin Van Peebles. At that time, he had two shows running on Broadway: "Ain't Supposed to Die a Natural Death" and "Don't Play Us Cheap."

Later, when Van Peebles was asked to run a group-ticket operation for the Broadway hit "The Wiz," in order to spur show sales, Catherine took on new responsibilities. She was curious. Selling tickets to groups can result in discounts as high as 25 percent per ticket.

Even though Catherine didn't know what was involved in running such an operation,

*KEN COACH is a producer for the Canadian Broadcasting Company and a freelance writer specializing in computer topics. He wrote the "Buyers' Guide to Joysticks" in the January FAMILY COMPUTING.*





*Catherine Cook in the Broadway theater district, where she started her group-sales business for Broadway shows. She now runs the business with a TRS-80 Model 4.*

she decided to give it a try. "All I knew was that it sounded exciting and I wanted to do it," says Catherine. So, in 1975, Catherine formed a partnership with Melvin; the business was called the Wiz Co.

Two years ago, her ears buzzing with computer talk from her son Dan, Catherine started typing the 20,000 names on her mailing list into Dara's computer. Dan would throw it into the backseat of the family car and deliver it to his mother. Now that she runs the business on her own, Catherine's bought her own 128K TRS-80 Model 4, along with a hard disk (which stores considerably more than a floppy disk), a modem, and a printer.

At the moment, Catherine primarily uses *Postman*, a combination mailing-list/data-base program which helps her separate potential ticket buyers by zip code, and weed out names that end up twice on the mailing list. She also uses the program to do selective mailings—city

by city—for traveling shows. She then prints out the mailing labels. Before she computerized, Catherine would type out the labels manually, and then photocopy them, which was very time-consuming.

She plans to expand her use of the computer to include bookkeeping, and to use the computer to expand her business by making labels for other small businesses.

It wasn't easy for the 64-year-old grandmother to move into computers, but it wasn't as difficult as she'd first imagined. "Dan keeps saying, 'Just read the manual, you don't need classes.' But I keep worrying about turning that on or this off . . . it's still foreign territory to me."

Catherine's advice to computer novices: "Sit down and play with the thing." To help people who have the same problems she's struggled through, she says she wants to write a "What if" book—"What to do if something goes wrong."

## **BUILDING AN ARSENAL**

While Dara's education was the springboard that got the Cooks involved with computers, they have other children who now are taking up the pastime.

The youngest is Naima, just 2 years old and already comfortable with preschool computer games. Dan's older children by a previous marriage, Akin, 15, and Taz, 22, have taken up the computer on their own.

Akin is a budding poet whose work was on display at a program sponsored by the Metropolitan Museum of Art a few years ago. But he's found his attention diverted lately by the challenges of computer games.

Taz now works as an engineer for DuPont in West Virginia, and runs the computer system in her department. While a student of chemical engineering at the City College of New York, she used a computer to help wade through a daily diet of mind-boggling differential equations.

To his initial 16K computer and a cassette recorder, Dan has added a whole slew of peripherals: two printers, a modem, a hard disk drive, and a memory upgrade to 48K. He's also bought TRS-80 Models 4 and 100!

Since the Cooks' TRS-80 computers were limited by their black-and-white screen displays, on Christmas 1983 the family treated itself to a Commodore 64, for game-playing. And now, Dan uses an IBM PC at work, which the hospital purchased for him. At the hospital, Dan is now known as the "Computer Whiz."

And what of Dara, who started it all? She's 10 now, and in fifth grade. She's "learned" Logo, and is now "mastering" BASIC, though she's not necessarily bent on a career as a programmer. Her interest is in science, Dan says—but that, too, will be intertwined with computers. "We still use the study guides together," says Dan. **FC**



# BUYER'S GUIDE TO KEYBOARD ALTERNATIVES

## TOUCH TABLETS, LIGHT PENS, MICE, AND SOFTWARE

BY W. PATRICK DICKSON

Using the computer means wrestling with a keyboard, right? Not necessarily. Lately, a number of innovations have appeared, dramatically expanding the ways you can interact with the computer. Paired with good software, special input devices—touch tablets, light pens, mice, and alternative keyboards—can add an exciting new dimension to your family's computing experience.

Of course, for some applications, the keyboard is king and always will be. It's the only efficient way to word process or use an electronic file system. For drawing, or using the computer with youngsters who may not have the dexterity or reading skills required for accurate keyboarding, a

host of special input devices are available for you to choose from.

A number of programs transform your computer into an art tool flexible and stimulating enough to rival any box of crayons or watercolor set. But until recently, while we've had the canvas (i.e. the screen), we haven't had an instrument to use with the computer that matched the paintbrush. We've had to manage with the keyboard and the joystick.

Drawing usually involves grasping an object, pointing, and moving it across a surface. So, using a joystick or keyboard often makes for awkward image control. Light pens, mice, and touch tablets make it much easier, giving the process a natural feel.

We tried out a number of different devices, and found that each had advantages and drawbacks. As a rule, though, you can be sure that any light pen or touch tablet is only as good as the software that's available for it. Consider both when deciding how to spend your money.

We considered these products in home, recreational, and creative contexts. If you use your computer strictly for typing or for processing data, your needs will be different.

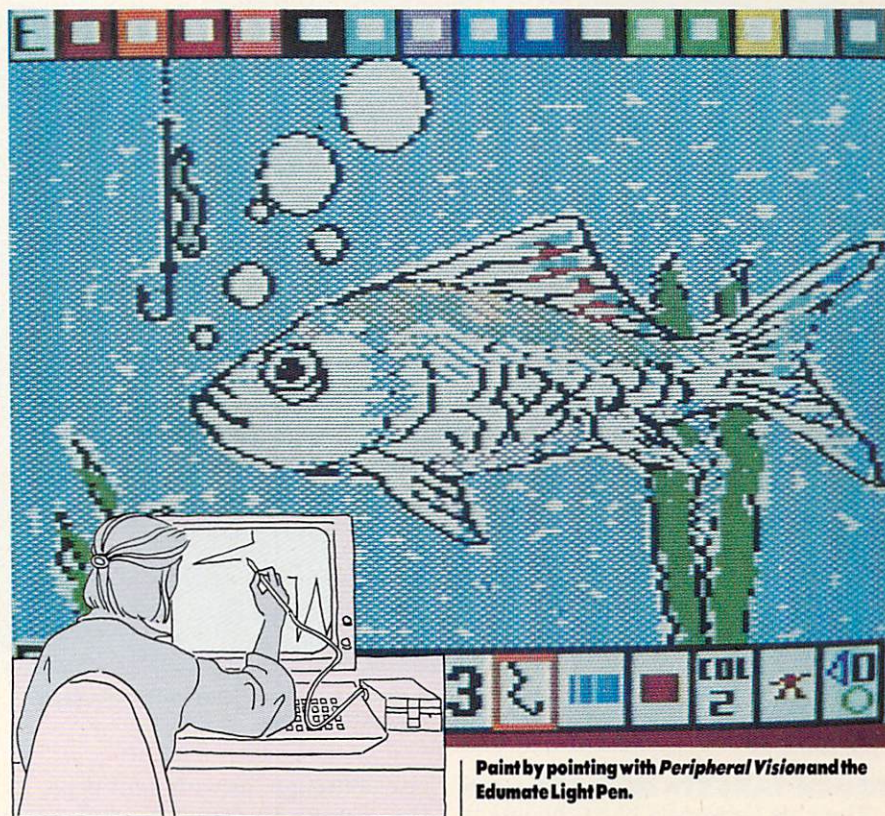
PATRICK DICKSON is an associate professor of Child and Family Studies at the University of Wisconsin. He coauthored "Sing a Song of Software" in the July 1984 issue of FAMILY COMPUTING.

### LIGHT PENS

Of the different devices available, the light pen would seem the most natural device for drawing or pointing on a personal computer. Indeed, light pens literally allow you to draw on the screen. Plug the pen into your computer's joystick port, place the pen at the location you're working on, and draw. The pen picks up the electron beams shooting across your TV screen, and sends them back to the computer. The software then uses those signals—for drawing or to help you make a menu selection.

One of the strongest software/input device combinations available for light pens is the **Tech-Sketch Light Pen** packaged with a program called **Micro Illustrator**, for the Apple II series, Commodore 64, and Atari Home Computers. When it appeared a year and a half ago, *Micro Illustrator* set a new standard for drawing software. Since then, the manufacturer, Island Graphics, has licensed it to a number of other companies besides Tech-Sketch. In addition, much of the newer drawing software strongly resembles *Micro Illustrator*. Clearly, it has been a trend setter.

Although versions vary somewhat, depending on the device you're us-



Paint by pointing with *Peripheral Vision* and the *Edumate Light Pen*.

ing, you should look for features like *Micro Illustrator's* in any drawing

program. The menu combines little pictures, or icons, to represent the



options you can choose from. Most versions let you specify the size and shape of your on-screen pen. Draw straight lines, boxes, circles, and frames. Fill enclosed shapes. Magnify sections of the creation. Create mirror images. Typically, you point your pen to an icon of an eraser to delete part of your work, or to a picture of a disk to save your work on disk. Choose different colors for your canvas and paintbrushes. You have hundreds of different combinations of color patterns and brush sizes to choose from at any one time, depending on which version you're using. At approximately \$30 (or free with some input devices) *Micro Illustrator* has to be considered a "best buy." Packaged with the Tech-Sketch Light Pen for Commodore and Atari owners, it's a better, though higher-priced alternative to the light pen packaged with *Paint 'n' Sketch*. Apple owners will have to invest an extra \$100 for an interface board.

Another strong contender is the **Gibson Light Pen System** for the Apple II series. It includes two disks: *PenPainter* and *PenDesigner*, which include a total of five programs. The programs have all the features found in *Micro Illustrator*, and then some. Make high-resolution drawings for architectural plans. Design layouts, electronic circuits, and so on. Save new shapes and symbols on electron-

ic index cards and then use them in other drawings. Isolate one portion of the drawing, erase it, move it to another section, and change its size.

In addition, you can print out your work, a feature found in too few drawing programs.

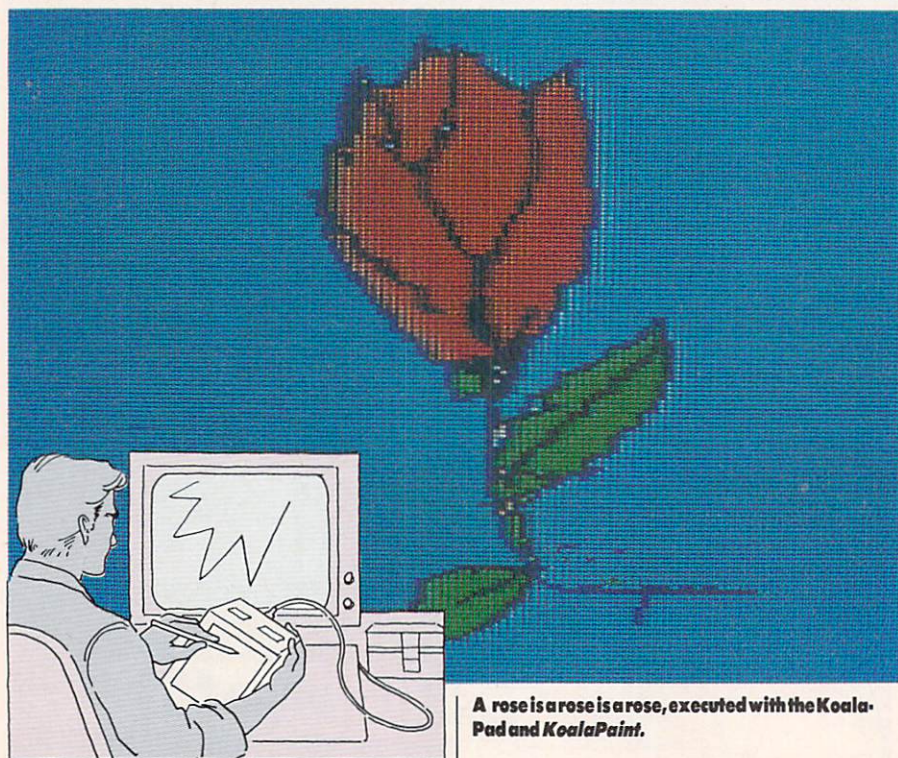
With the "PenAnimator" section of the program, you can create an animated sequence. "PenMusician" lets you compose music by pointing to notes and pasting them to the on-screen staff. (There are better programs for animation and music, but these are good extra features.)

Another system worth considering is the **Edumate Light Pen** with *Peripheral Vision*, a pen/software combination comparable in power and capabilities to *Micro Illustrator*. Menu selections for *Peripheral Vision* are located along the top and bottom borders of the screen at all times—in contrast to *Micro Illustrator*, which requires you to flip back and forth between the menu and the drawing screen. About the size of a ballpoint pen, the Edumate Light Pen is one of the most comfortable to hold. Make sure the package you get includes *Peripheral Vision*. The version that contains a limited graphics program is not recommended. Futurehouse has published a number of educational activity programs that make use of the Edumate pen. (See chart.)

For extremely detailed drawings,

explore the **Flexidraw Light Pen**, for the Commodore 64. The accompanying software is good for more serious uses, black-and-white design plans, for instance. But you'll need a special program for color pictures. The pen itself is thicker than others, and doesn't fit in the hand as well. But unlike others, which require you to press a button on the light pen or a key on the keyboard to activate the drawing process, the Flexidraw works when gently pressed against the screen. All in all, a combination recommended more for serious design and engineering purposes, not guaranteed to be as attractive for kids and informal use.

Light pens mimic the drawing/pointing process and let you trace directly on the work in progress. But, as a breed they are not as easy to use or as comfortable as you'd imagine. The students I watched tired after just a few minutes of holding the pen up to the screen. Light pens also turned out to be somewhat "fussy" when it came to the actual drawing. You must hold them at just the right angle and you can't move them too quickly across the screen. No doubt, this problem will diminish as the technology improves. An adult with a steadier hand and an arm big enough to rest on a workspace while drawing at the computer screen will not find the oversensitivity too troublesome.



A rose is a rose is a rose, executed with the Koala-Pad and KoalaPaint.

## TOUCH TABLETS

The kids I observed liked the touch tablet as a drawing device. Touch tablets tend to be accurate and pre-

cise (although, as with light pens, for the signal to register, you can't sketch too rapidly). You can use them in a variety of positions: Lean back in

your chair and use it on your lap, or lay the pad directly on the table. To draw and point, use a stylus or pointer that comes with the package, or use your finger.

You might think pointing on a pad and watching the cursor move in parallel on the screen would be confusing for kids. But, here at the University of Wisconsin, we found that children as young as 3 years of age learned to work the pads in a few minutes. Adults take less than a minute to learn to use them. Touch tablets are easy to hold and they aren't tiring for kids to use over extended periods of time.

Combined with *Micro Illustrator*, the **KoalaPad Touch Tablet** is a superior drawing system. Three-year-olds mastered the small 6 × 8-inch device quickly, and found the software simple and loads of fun to use. Other software for the KoalaPad, such as *Spider Eater* and *Paint a Rhyme*, aren't particularly practical, though they provide entertaining computer activities. The tablet is available for the Apple II series, Atari Home Computers, Commodore 64, and IBM PC/PCjr.

**Animation Station**, for Apple II series and Commodore 64 comput-



ers, comes with a fine program, *Design Lab* (developed by Baudville). Though the touch pad itself is slightly bulky and a bit oversensitive, the software has a number of unique features. Cutting and pasting is a sim-

ple process, and you can use shapes prepared for the program.

For a package that takes advantage of the excellent range of hues available on Atari computers, you may want to look at the **Atari Touch**

**Tablet**. Packaged with *AtariArtist*, a cartridge-based program almost identical to *Micro Illustrator*, the Atari Touch Tablet is one of the best tablets we examined, in terms of precision and accuracy.

## THE MOUSE

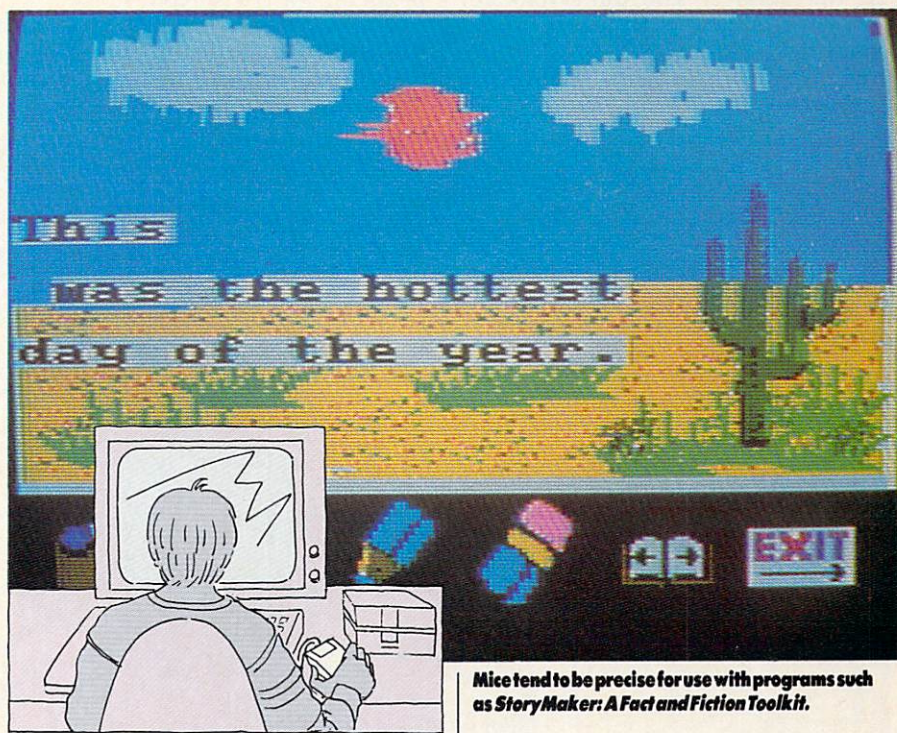
For feel and control, the mouse, a small box that fits in the palm of your hand, is halfway between the touch tablet and the light pen. The physical motion of writing or drawing is not unlike manipulating a mouse. When the mouse is moved over a flat surface, the ball-bearinglike device in its underbelly touches a sensor, which sends signals to the computer. It's not quite as "natural" as sketching with a stylus, but it's more comfortable than writing on a vertical screen. Kids find mice as a breed easy to manage. Mice give you more control and precision than you'd have with a joystick. They're available for Apple and IBM PC/PCjr computers.

For families with limited room, or for whom an open surface is an invitation for clutter, finding space to move the mouse can make it something of an inconvenience. Some people complain that it has a less natural feel than a light pen or a touch tablet. For example, the cursor's position on-screen doesn't necessarily correspond to the position of the mouse on your working surface. If you lift the mouse over to the far left of your surface, the cursor won't automatically move to the far left of your screen.

## A WORD ON THE MAC

Perhaps the most famous mouse on the market is the one that comes with the Apple Macintosh. Many college students, businesspeople, and homemakers have greeted this computer as an easy-to-use tool for word and data processing, largely thanks to its friendly mouse. Instead of pressing cursor keys or manipulating the joystick, you push the mouse over a flat surface. The number of games and productivity programs for the Mac that have been announced or are in production indicates that the new device may have set a new standard. The Mac keyboard doesn't even have cursor keys.

*MacPaint*, the standard drawing package that comes bundled with the



Mice tend to be precise for use with programs such as *StoryMaker: A Fact and Fiction Toolkit*.

computer, is an advanced design tool that takes advantage of the new computer's mouse interface and extremely advanced (though black-and-white) graphics capabilities.

**Apple Mouse II with MousePaint** allows IIc and enhanced IIe owners much of the power of the *MacPaint* system and a rainbow of colors you can't yet find on the Macintosh. *MousePaint* lets you create directly on a screen that's like a window to a larger drawing surface. A spray feature lets you shadow parts of your drawing. Cut and paste, write with a variety of typefaces, and zoom and flip parts of your creation.

*PC Paint*, for use with the **PC Mouse**, is very much like *MousePaint* for the Apple mouse. It includes a wide variety of colors, textures, shapes, and type fonts. You can cut and paste sections of your drawing, magnify them, and change or erase portions of the picture. The program comes with sets of predrawn pictures that can be added to your drawings.

Mouse Systems' PC Mouse has three buttons and sits comfortably in your hand. Because it is an optical mouse and uses light beams instead of the ball-bearing, it is more precise (and more costly). It also requires that you move it on a special tablet.

Many of the new programs coming out for the Apple IIe and IIc have an option for using the mouse instead of a keyboard or joystick (see chart). Of particular note is Broderbund's *Dazzle Draw*, a drawing package that lets you create remarkable works of art in detail and brilliant color. Scholastic's drawing/story-creating program, *Story Maker: A Fact and Fiction Toolkit*, lets you compose stories and print them out in a variety of typefaces and illustrate them with a rich selection of preprogrammed shapes and pictures. You can even get extra pictures on an additional space and fantasy "theme" disk. Both these packages harness the pointing power of the mouse in remarkably stimulating ways.

## ALTERNATIVE KEYBOARDS

In the search for ways of letting young children experience the computer before they acquire keyboard skills, a number of innovative devices have been created.

**Muppet Learning Keys**, for instance, is intended for young chil-

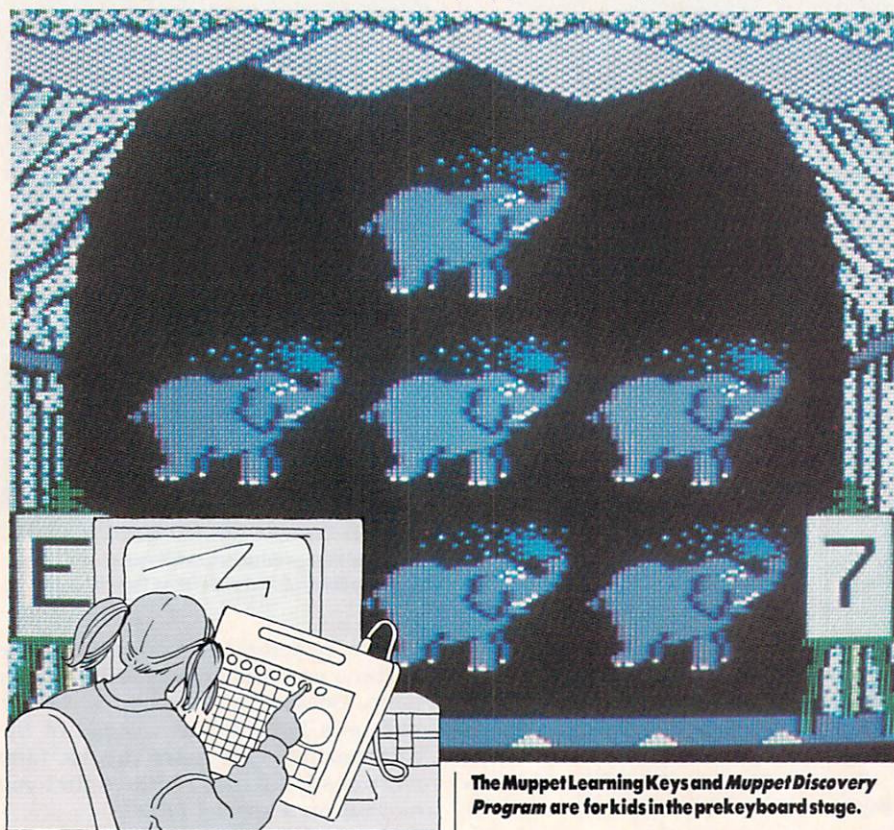
dren. A large, 16 × 16½-inch device features numbers, colors, and letters arranged alphabetically on a soft, modified keyboard. The package's software, *The Muppet Discovery Program*, is a superb number and letter-recognition program, which my kids enjoyed. It has some great features,

not the least of which is Miss Piggy herself. In my opinion, the software pulls its own weight—without the special board. I've found that most preschool-age kids are quite capable of handling a standard keyboard.

Likewise, the **ColorTone Music Keyboard**, for the Commodore 64,



uses wonderful software, although the input device itself is of questionable value. It's a membrane device—no keys per se—just a smooth jelly-resistant surface with a piano keyboard and a harplike panel painted on the surface. The *ConcertMaster* software comes with prerecorded songs, in a variety of musical styles, which you can play along with on the keyboard.



The Muppet Learning Keys and Muppet Discovery Program are for kids in the prekeyboard stage.

Notes of the preprogrammed songs scroll across the screen, alongside notes you play. Because the computer automatically screens out any sour notes you play, the music always sounds good. This helps dissolve some of the barriers to getting your children or any of the family's novice musicians interested in playing music. However, it also may mislead you into thinking you're playing better than you really are. I found the keyboard difficult to adjust to the proper pitch and clearly not as easy to play as a regular pianolike keyboard. Also, I believe the harp, which you play or strum in a sort of random fashion, is not likely to hold your child's interest (or yours) for very long.

**Keyport 717** is an intriguing device for Apple computers. Even larger than the Muppet Learning Keys, this 11 × 24-inch board also requires considerable effort to adjust to the software.

*The Farm*, an educational disk that comes with the package, introduces children to farm animals

through a series of games and activities. The overlay accompanying the software depicts a large farm scene. By pressing any one of the 60 objects on the scene, a picture and the name of the animal, building, or tool appears on the TV screen. Press a key that says WHAT DOES IT SAY? and the name of the sound appears on the screen—MOO, for instance. If your Apple has a synthesizer, you'll hear

the sound, too.

At an advanced level, you can compose a story by using the words and objects represented on the keyboard or by entering your own words. An overlay intended to simplify BASIC programming and one for using VisiCalc, the electronic spreadsheet, also are available, along with some other educational packages. Overall, this is a peripheral that I believe hobbyists will enjoy.

When it comes to getting in touch with your personal computer, drawing is the experience most enhanced by the variety of alternative input devices available. Nevertheless, as we have seen, a number of hardware/software combinations are dedicated to other tasks.

Driving good software, a light pen, touch tablet, or mouse can really expand the power of your computer as a creative tool and open up important new avenues of creativity and entertainment. Refer to the accompanying chart for a list of the devices and software available. **☐**

Here's a host of device/software combinations for families who want to get in touch with something more

#### NAME/PRICE/HARDWARE

#### LIGHT PENS

**Edumate Light Pen**  
\$34.95; w/Edumate Light Pen Program  
\$59.95 w/Peripheral Vision  
(Atari, C 64)

**Flexidraw Light Pen System**  
\$149.95 (C 64)

**Gibson Light Pen System**  
\$249.95 (Apple; planned for IBM PC/PCjr)

**Tech-Sketch Light Pen**  
\$34.95 w/Paint 'n' Sketch  
\$49.95 w/Micro Illustrator  
(Apple, Atari, C 64; planned for IBM PC/PCjr)

#### MICE

**AppleMouse II with MousePaint**  
\$149 (Apple)

**Microsoft Mouse**  
\$195 (IBM PC/PCjr) w/utility disk

**PC/PCjr Mouse**  
\$175 (sold separately as Field Mouse)  
\$195 w/Designer Pop-Up Menu Software  
\$220 w/Designer Pop-Up Menu Software and PC Paint

#### TOUCH TABLETS

**Animation Station**  
\$89.95 (C 64)  
\$99.95 (Apple)  
(Version planned for IBM)

**Atari Artworks Touch Tablet**  
(Price expected to be less than \$50)

**KoalaPad Touch Tablet**  
\$99.95 (C 64, Atari disk)  
\$110 (Atari cartridge)  
\$125 (Apple, IBM PCjr)  
\$150 (IBM PC)

#### MISCELLANEOUS

**ColorTone Keyboard**  
\$79.95 (C 64)

**Keyport 717**  
\$179 (Apple)

**Muppet Learning Keys**  
\$74.95 (Apple, Atari, C 64)

**Super Sketch**  
\$49.95 (Atari)  
\$59.95 (TI-99/4A, ADAM, C 64)

**Super Sketch II**  
\$89.95 (Apple, IBM PC/PCjr)



# GUIDE TO KEYBOARD ALTERNATIVES

than the everyday keyboard. Unless otherwise noted, the companies that manufacture the hardware also

make the software. However, as the KoalaPad and mice for the Apple (and any other special device, for

that matter) become more popular, you'll find more software compatible with these special tools.

| MANUFACTURER                                         | SOFTWARE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Futurehouse<br>(919) 967-0861                        | <i>Alphabet Construction Set</i> (\$34.95; C 64): Kids practice writing letters by copying those presented on-screen.<br><i>Animal Crackers</i> (\$34.95; C 64): Children practice alphabet and spelling by touching pen to screen and seeing animals.<br><i>Blazing Paddles</i> (available from Baudville, \$34.95; C 64): Graphics package includes prepared shapes. Use seven brush strokes, cut and paste, zoom, fill functions, and a variety of colors.<br><i>Computer Crayons</i> (\$34.95; Atari, C 64): Children press letter and color in picture representing word that begins with letter. Best suited to young children.<br><i>Little Red Riding Hood</i> (\$34.95; Atari, C 64): Children practice letter-matching in story on a disk.<br><i>Peripheral Vision</i> (\$39.95; Atari, C 64): Excellent range of colors, drawing possibilities, available in good graphics package.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Inkwell Systems<br>(619) 268-8792                    | <i>Blazing Paddles</i> (available from Baudville, \$34.95; C 64): Graphics package. See above.<br><i>Flexidraw 4.0</i> (comes with package): Excellent design tool makes for fine, detailed monochrome drawings.<br><i>Flexifont</i> (\$29.95; C 64): Generates different letters and fonts for use with Flexidraw.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Koala Technologies<br>(408) 986-8866                 | <i>PenPainter</i> and <i>PenDesigner</i> (come with package): Sophisticated programs with advanced features suitable for architectural design.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Tech-Sketch Inc.<br>(201) 227-7725<br>(800) 526-2514 | <i>Blazing Paddles</i> (available from Baudville, \$49.95; Apple): Graphics package. See above.<br><i>Paint 'n' Sketch</i> (Apple, Atari, C 64, planned for IBM PC, comes w/package): Less comprehensive drawing program.<br><i>KinderWare</i> (\$39.95; Atari, C 64): Six programs featuring math and spelling activities for preschool to third graders.<br><i>Lite Sprite</i> (\$49.95; C 64): Animation package lets you create, edit, animate, and print sprites.<br><i>Micro Illustrator</i> (\$34.95; Apple, Atari, C 64): Use outstanding graphics program to magnify, fill, and mirror images.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Apple Computer<br>(408) 996-1010                     | <i>Blazing Paddles</i> (available from Baudville, \$49.95): Graphics program. See above.<br><i>Dazzle Draw</i> (available from Broderbund, \$49.95): Dynamic art/graphics program allows for rich variety of color and many different functions, e.g. zoom, cut and paste, shadowing, etc.<br><i>Grandma's House</i> (available from Spinnaker Software, \$34.95): Kids furnish Grandma's house using props and characters from a variety of settings. Reviewed October '84 in FAMILY COMPUTING.<br><i>Music Construction Set</i> (available from Electronic Arts, \$40): Place notes on scale, adjusting tempo, tone, sound quality, etc. in excellent introduction to music. Reviewed April '84 in FAMILY COMPUTING.<br><i>Story Maker: A Fact and Fiction Toolkit</i> (available from Scholastic Software, \$39.95): Compose stories using prepared pictures, or your own illustrations and text in a variety of type fonts and sizes. Additional picture disks available.                                                                                                                                                                                                                                                                                                                                      |
| Microsoft Corp.<br>(206) 828-8080                    | <i>IBM PCjr ColorPaint</i> (available from IBM, \$99 cartridge for IBM PCjr): Complete graphics program uses icons; features drawing space larger than screen. Add text, select from 15 brush shapes, zoom, "undo" mistakes, etc.<br><i>PC Paintbrush</i> (available from IMSI, \$139 for IBM PC/PCjr): Paint with 10 brush shapes. Add text in a variety of styles, sizes, and fonts; move around sections and store portions of pictures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Mouse Systems Corp.<br>(408) 988-0211                | <i>PC Paint</i> (IBM PC/PCjr, comes with Mouse Systems package): Graphics package with prepared shapes, textures, colors, type fonts, cut and paste functions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Suncom, Inc.<br>(800) 323-8341                       | <i>Design Lab</i> (comes with package): Good graphics package permits easy cutting and pasting and use of prepared shapes.<br><i>Shape Library</i> (\$29.95; Apple; planned for C 64): Forty preprogrammed shapes (buildings, farms, animals, etc.) for use with creations executed with <i>Design Lab</i> .<br><i>Spellbound</i> (\$24.95; C 64): Children put letters of scrambled words back in order.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Atari Corp.<br>(408) 745-4851                        | <i>AtariArtist</i> (comes with package): Excellent art program with full range of features.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Koala Technologies                                   | <i>Coloring Series I</i> (\$29.95; Apple, Atari, C 64): Paint shapes with "fill" feature found in <i>KoalaPainter</i> .<br><i>Instant Programmer's Guide</i> (\$19.95; Apple, Atari, C 64, PC): Write your own programs using KoalaPad. Recommended to anyone interested in programming the tablet.<br><i>KoalaGrams Spelling I</i> (\$29.95; Apple, C 64, PC): Children unscramble simple words presented in mixed-up form. Not a particularly good use of the tablet.<br><i>KoalaPainter</i> (comes with Apple, Atari cartridge, C 64, IBM PCjr packages): Graphics package with good color, line, and shape selection; not as comprehensive as <i>Micro Illustrator</i> .<br><i>Logo Design Master</i> (\$39.95; Apple, C 64): Requires Apple or Commodore Logo and allows users to write procedures in Logo for use with KoalaPad.<br><i>Micro Illustrator</i> (\$39.95; Apple, Atari, C 64, IBM PC/PCjr): Outstanding graphics package. See above.<br><i>Paint-a-Rhyme</i> (\$29.95; C 64): Color pictures accompanying 56 Mother Goose nursery rhymes. Simple music accompanies words that move across screen. Pleasant but not likely to hold child's interest for long.<br><i>Spider Eater</i> (\$29.95; Apple, Atari, C 64): Zap a spider by pressing "notes" on special overlay in simple music program. |
| Waveform Corp.<br>(415) 841-9866                     | <i>ColorTone Keyboard Software</i> (comes with package): Entertaining and instructive introduction to music lets you play and improvise without a bad note.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Polytel Computer Products<br>(800) 245-6655          | <i>BASIC</i> (comes with package): Disk plus overlay makes for a shortcut to BASIC programming by providing "keys" which condense commands for colors or GOSUB commands.<br><i>The Farm</i> (comes with package): Introduction to farm, with overlay.<br><i>The Safari</i> (comes with package): Introduction to safari, with overlay.<br><i>USA Geography</i> (available from Liberty Logic; \$39.95): U.S. geography taught with aid of U.S. map overlay.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Koala Technologies                                   | <i>Muppet Discovery Program</i> (comes with package): Excellent number- and letter-recognition program delights kids.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Personal Peripherals, Inc.<br>(214) 758-8874         | <i>Graphics-Master</i> (comes in cartridge with Atari, C 64 packages): Variety of brushstrokes and colors, plus flip, mirror, and zoom functions in graphics package for device that lets you clip drawings to surface and trace them with a stylus.<br><i>Super Music Box</i> (\$24.95; C 64): Compose, edit, play back, and even print out score, plotting notes on staff.<br><i>Printer Utility</i> (\$29.95; C 64): Print out creations executed on <i>Graphics Master</i> .<br><i>Sketch Master</i> (cartridge comes with TI-99/4A, ADAM packages): Simple drawing/painting program provides the basics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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**THIRD-PARTY MANUFACTURERS** Baudville: (616) 957-3036; Broderbund: (415) 479-1170; Electronic Arts: (415) 571-7171; IBM: (305) 272-2662; IMSI: (415) 454-7101; Scholastic Inc.: (212) 505-3000; Sierra, Inc.: (209) 683-6858; Spinnaker: (617) 494-1200.



# USERS'

## HOW TO FIND A

# GROUP

BY JACQUELINE AUSTIN

**T**he beginning of the year means lots of new computer owners around, and that means plenty of happy and confused people exploring the joys and frustrations of getting to know their machines.

Most computer owners find that one of the best places to turn with questions is a users' group. There you'll find kindred spirits; hot tips; the inside story on free software, new programs, and peripherals; programming advice; and someone who can tell you where to find that cable (the one you didn't even know you need-

ed) for \$3 instead of \$30.

To find the nearest users' group, ask at your local computer store or call the computer-science department of a nearby college for information. If you have access to an electronic net-

work such as CompuServe or The Source, or if you can tap into a computer bulletin board, check there for information. Your community librarian, adult-education specialist, and computer repair shop are other good sources. Finally, here's a list of leads, arranged by computer brand, for you to pursue. Remember: New users' groups are formed all the time, and addresses and meeting dates change often, so keep an eye out for announcements and stay in touch with your computer's manufacturer. And, on the following page, we tell you how to start your own group.

### ADAM

Coleco does not sponsor ADAM users' groups, but it does keep a list of existing groups and supports their efforts. To find one in your area, contact: Coleco, 999 Quaker Lane S., West Hartford, CT 06110.

### APPLE

Apple users' groups are independent of the manufacturer. One of the largest groups—The International Apple Core, 908 George St., Santa Clara, CA 95050—may be able to refer you to people in your area. The organization keeps a list of 320 other users' groups!

### ATARI

Although Atari used to maintain a list of users' groups, the company will no longer be doing so. It will, however, refer you to Atari Users' Groups International (AUGI). That group will publish information for users' groups and help them communicate with each other, as well as with Atari (which promises to lend support to AUGI). At the moment, only users' groups, not individuals, can join AUGI, which plans to match people who send postcard requests to already existing local users' groups. Write to: Ike Hudson, AUGI, P.O. Box 16132, Lansing, MI 48901. *Antic Magazine*, which specializes in Atari computers, plans monthly conferences on the CompuServe and PLATO networks with presidents of users' groups, and will list on-line directories of users' group addresses.

### COMMODORE

There is an extensive network of independent Commodore users' groups across the country. The manufacturer is helping out by appointing a representative to coordinate support for them. Write to: Pete Baczor, User Group Coordinator, c/o Commodore, 1200 Wilson Drive, West Chester, PA 19380; (215) 431-9100. Baczor is planning a newsletter and is most interested in talking to people who want to start up their own groups. One especially large and active users' group is the Pittsburgh Commodore Group, 2015 Garrick Drive, Pittsburgh, PA 15235, which publishes a monthly newsletter for all Commodore owners. VIC-20 owners can write to the VIC-20 Computer Club, 4071 Edgewater Drive, Orlando, FL 32804.

### IBM

IBM groups, like Apple's, are independent of the manufacturer. Call your local IBM Product Center or Computerland for leads. PC, 80 Wall St., No. 614, New York, NY 10005; (212) 533-NYPC, is a large group of IBM users and may be able to refer you to a club in your area. Also try: IBM PC Club and News, 9120 Grammercy Drive, No. 416, San Diego, CA 92123.

### TANDY/RADIO SHACK

Most owners of these machines should have little trouble finding users' groups since there are 9,000 Radio Shack Computer Centers around the world. Call or visit your local store for information, or write TRS-80 User's Group Inc., P.O. Box 3912, Odessa, TX 79760 or The International Color Computer Club, 2101 E. Main St., Henderson, TX 75652.

### TEXAS INSTRUMENTS

Since Texas Instruments has left the personal computer business, users' groups are independent of the manufacturer. Try the Delaware Valley User's Group, P.O. Box 6240, Stanton Branch, Wilmington, DE 19804; 99'er TI User's Group, P.O. Box 1381, Maitland, FL 32751; or Chicago TI-99/4A User's Group, Triton College, River Grove, IL 60171.

### TIMEX SINCLAIR

Like TI owners, Timex users' groups are on their own. Try Triangle Sinclair User's Group, c/o Douglass Dewey, 205 James St., Carlsboro, NC 27510; Sinclair End User's Group, 2170 Oakbrook Circle, Palatine, IL 60067; or Z-X Timex Group, 950 Cynthia Drive, Titusville, FL 32780.

JACQUELINE AUSTIN is the author of this month's cover story on computer care.



# USERS'

## HOW TO START A

# GROUP

**Y**ou want to join a users' group, but there isn't one in your city for people who own your brand of computer. Or maybe you're in a smaller town and no one has gotten a group going yet. No matter. Starting up a group of your own may take some effort, but the rewards should be worth it.

Most users' groups, or computer clubs, get together once a month at a school, library, computer store, or

other meeting place. Often, additional meetings are held by subgroups of members and are called Special Interest Groups (SIGs). SIGs usually meet at a member's home, since they are small groups. Dues average about \$10 to \$30 a year, depending on the range of activities. That money can be used to rent a meeting room, cover postage for a newsletter, and maintain a software library.

Here's a list of suggested steps to take in forming your group.

BY TAYLOR BARCROFT

1

### PICK A NAME

Create a catchy name for your group that reflects the geographic scope you want to include as well as the computer brand, such as "The Big Sky 99ers," "Frederick Apple Core," or "The Greater Gulf Coast Computer Club."

2

### SEND OUT A PRESS RELEASE

Use your computer's word-processing capabilities to generate an announcement about the group. Send it to magazines, newspapers, and radio and TV stations, marked ATTENTION: COMPUTER NEWS EDITOR. List your name, address, and phone number at the end.

3

### MAKE A POSTER

Put together a one-page announcement/poster you can photocopy and tack up on bulletin boards at school, in computer stores, and at other locations in your area. Include your phone number on the poster, and ask people interested in joining the group to call you.

4

### CREATE A LIST OF OWNERS

As calls come in, take down phone numbers and addresses, preferred nights for meeting, age, special interests, and previous computer experience.

5

### FIND A MEETING PLACE

You may also ask callers if they know of a meeting place you could get free or cheap.

6

### ANNOUNCE & HOLD THE FIRST MEETING

Once the date and place are all set, go through steps 2 and 3 again, plus phone the people on your initial membership list to announce the first meeting. Make it informal and discuss opinions on what the group should be and do. Collect dues. Agree on the time and place of the next meeting. Start SIGs. Choose a newsletter publishing team.

7

### PUBLISH A NEWSLETTER

Create a newsletter/membership application and dues-request form. Mail it to all who have called so far, plus any new callers. Repeat steps 2 and 3.

8

### ELECT OFFICERS

At the third meeting, elect officers. Then carry on.

TAYLOR BARCROFT founded the ADAM Users of America. For information on his users' group write to P.O. Box 2178, Huntington Beach, CA 92647.



# Jack Is Back

THE FOUNDER OF COMMODORE IS NOW THE CHIEF OF ATARI, BUT THE GAME'S THE SAME. HOT TECHNOLOGY AT ROCK-BOTTOM PRICES!


BY NICK SULLIVAN

**T**ough-talking, cigar-chomping Jack Tramiel is one of those great American stories. He made it to the top, and he made it on his own. "We live in an industry where people still have dreams of becoming millionaires. I'm living proof that it can be done." Stories like his are always fresh because the people who author them are always originals.

Tramiel was born in Lodz, Poland. He came to the U.S. in 1947, and started out driving a cab in New York City. While in the Army, he learned how to fix adding machines and typewriters. In 1955 he moved to Canada, and three years later started his own typewriter-repair company, Commodore Business Machines Ltd. By 1983, Commodore's revenues were more than \$1 billion; Tramiel was president. In January 1984, after a dispute with the board of directors about the company's future, Tramiel shocked the industry with his resignation.

In July, he and a group of investors bought the ailing Atari, Inc. from Warner Communications. Tramiel says he's pumped \$30 million ("out of my pockets") into Atari, has another \$45 million on call, and plans to raise another \$150 million in the next year-and-a-half. Atari, he says, will be a billion-dollar company by the end of 1985. Judging by initial response from the financial community, all this will be a tall order even for a man with Tramiel's track record.

Earlier this winter, Tramiel invited FAMILY COMPUTING to his office for a private talk, in which he outlined his four-pronged approach to the computer market. He expects to keep the Atari videogame business going, and says he'll keep selling and improving the Atari 800XL line. His plans also include a computer with a mouse that operates somewhat like the



Jack Tramiel, chairman of the board of privately held Atari Corp.

PHOTOGRAPH: SAN JOSE MERCURY NEWS



Apple Macintosh, but with color, and a price tag under \$500. Later, he'll bring out a more professional color-graphics computer (less than \$1,000) for architects, engineers, and designers.

"I'm out to bring some life back to the industry!" says Tramiel, with a bellowing laugh. Out in Silicon Valley there's already new life. The word is, "Jack is back!"

**FC:** Where does your fascination with computers come from?

**Tramiel:** I've been involved in computing since the day I joined the U.S. Army. That was on Governor's Island in New York. I was repairing office machines. When I left the service I started working for a typewriter/adding-machine company. Then I became a distributor of typewriters and adding machines. Then I went into assembly of typewriters and adding machines, with my own company. So to me, adding machines are computers. Mechanical computers.

As the technology moved, I moved along with it. Then I sold my mechanical adding-machine business and I started to buy and sell electronic calculators. And from electronic calculators I started making computers.

So all the time I've just been upgrading, because I believe a person should never put his nose into the sand and say, 'This is it.'

**FC:** How did you come to buy Atari?

**Tramiel:** I did not look for Atari. Atari was looking for me. In June I was called by the investment bankers of Warner. We came to an understanding. It was a good deal for both groups, and I bought Atari.

I started a business when I left Commodore called Tramiel Technology. So, I didn't have it in mind to buy Atari, but just to start a new computer business, which in my opinion the world needs.

**FC:** To do what? What do you want to achieve?

**Tramiel:** I want to have an Atari computer in every single home. I want every single individual to own one.

**FC:** And what about the business market?

**Tramiel:** No, I'm not interested. I started in 1976 at Commodore by introducing a personal computer [Commodore PET]. Today, I still want to design, manufacture, and sell the best, lowest-priced computers in the world. And feed the world's youth the best technology at the lowest price.

**FC:** Many people, in different types of businesses, set out to be the low-cost producer of a quality product. How do you win at this game?

**Tramiel:** It's very simple. Keep a lean ship. Keep a very tight ship. I like to run things on a personal basis. I don't like it—I hate it—when people are referred to by numbers. I still like to

call people by their first name; I like to know everyone. I like to be involved, from shipping to finance, from engineering to assembly. And I want everyone else to be involved. I like to keep it small. Atari was losing \$10 million a month when I came. There was a lot of fat to cut.

Also, it's not in the selling. It's in the buying.

**FC:** What kind of advertising message will convey to the American people the need for a computer in the home?

**Tramiel:** I don't believe any message is required, because the age group I'm aiming at, 6- to 26-year-olds, knows it needs computers. The 20 million kids who bought Atari videogame machines, or VIC-20 computers, are ready to graduate. They know. Anybody over the age of 30, I call them over the hill. Those people have to be taught how to use a computer. Young people learn about computers in school. They come out and they need the tool.

So, I believe that the way to sell products is not through marketing but through technology.

**FC:** So you feel that all you have to do is deliver the product at an affordable price and it will sell?

**Tramiel:** Yes. I have done it before and I'm going to do it again on that basis, because I strongly believe that the buyer is extremely smart. And when he spends his own money, he wants to get the best return for his buck.

When a buyer who is 50 years old—that's still young to me—goes out and buys a computer for his company, he's not spending his own money. He just wants to be sure that no one will tell him he bought something wrong, so he buys an IBM to be safe.

If he works for a school or in government, he spends my tax money—my tax money!—because he's scared to buy a low-priced machine with the same features, the same components, as an expensive machine. No different. No different, but one costs \$200 and the next one costs \$2,000.

So, because of this buyer's inexperience, the company, the school, the government, pays more. But that same individual, when he spends his own money, is very careful.

**FC:** Will any of your new computers be IBM-compatible?

**Tramiel:** If we come up with brand-new technology—far advanced—which cannot be compatible, should we stop because Mr. X has an old machine? 'Don't you dare make a new one.' Is that what people say? The answer to the question is No.

**FC:** What are you going to do about keeping the price down on software for the home?

**Tramiel:** I have never allowed software to be sold at high prices. I made sure I sold all software at a reasonable price. And, I offered the



**"I LIKE TO KEEP IT SMALL. ATARI WAS LOSING \$10 MILLION A MONTH WHEN I CAME. THERE WAS A LOT OF FAT TO CUT."**





"I HAVE KEPT  
THE JAPANESE  
OUT FOR A LONG  
TIME WITH MY  
PRICES."

software buyers volume. Some of them understood, some did not. But in time, they have turned around.

I don't believe any piece of software—any!—should sell for higher than \$49.

**FC:** How would you characterize the computer industry in 1984?

**Tramiel:** After I left the business in January 1984, it was dull without me. No price cuts, no technological breakthroughs!

The end-users are intelligent, know how to read, and know the value of products. These people know that there's new technology coming out, they know that there're better chips, they know there are better micros, they know the cost is coming down.

And, when they see that the manufacturer of the hardware is not bringing the price down, they know that if they wait six months or a year, the price will come down. So they wait. That's the reason why '84 was such a bad year. Because I left the business in January, and everything became very stable. Nobody cut prices. Greed! Take as much as you can!

**FC:** How long will you keep the Atari 800XL line going? And can you tell us something about the new computers?

**Tramiel:** The new computers I will show in January at the Las Vegas CES and in March in Hanover, Germany. There will be number of variations in the 800 family. More memory, 128K. I believe very strongly that the 8-bit family is here to stay for quite a while—because a beginner does not need more than that. And all the new units will be upwardly compatible with the 800XL.

Internally, I can tell you, we call the new 16-bit computer RBP. Rock-Bottom Price! Very simple. Very direct.

**FC:** What is that price range in your mind? Is there a cutoff, a magic number?

**Tramiel:** It has to be far below \$500.

**FC:** You said before that your market is 6- to 26-year-olds. But kids that age don't necessarily have the money, do they?

**Tramiel:** That's why I sell everything a *la carte*. I don't believe in selling the whole system. The user can buy as he can afford—buy a CPU first, then a monitor, then a printer, then additional software. Whereas Coleco was trying to sell the whole system at once [*the ADAM*], I find there're more people with \$200 than with \$600!

I'm trying to give people a chance to start, to build. There's no end to what you can do with a computer. You can expand it as far as you want. If you buy a \$200 CPU and spend an additional \$5,000, maybe you can talk to your buddy on the North Pole.

**FC:** Will you bring out much software with these new machines? Or will you let the soft-

ware catch up to the machine, as you did with the Commodore 64?

**Tramiel:** I definitely will not bring out a lot of software because that's an impossibility. Anybody who tells you otherwise is a damn liar.

When we introduced the 64, we had very little software. Everyone was telling me how unsuccessful it was going to be. Now, to me, the only way and the best way to encourage third-party software people is to tell them the number of units out there. To make them interested in writing software. You see?

The computer is fun. It is friendly. The individual can do so many things himself with a CPU. He does not require a specific application. This Atari computer is not a business computer, which you use for receivables or inventory. The computer is not something that does one specific application, like opening up the toilet door.

You have to be creative.

**FC:** But not every individual's going to be a programmer. A lot of people are going to need software.

**Tramiel:** I'm talking about the kids from 6–26 who know! They can and do write programs. I'm not talking about people older than this, who are scared of the computer.

**FC:** Certainly that's an unconventional view of the market. Most computer manufacturers going after the home market are going after young professionals in their 30s, or parents of young children, or both.

**Tramiel:** This is what makes a horse race.

**FC:** How's your relationship with dealers?

**Tramiel:** We will be selling products to anybody with cash. People who don't pay their bills have very bad relations with me. I would like to sell mostly through mass-market outlets. Mass marketers work on a much smaller profit margin than the boutiques.

**FC:** Who do you think will be your major competition in 1985?

*Tramiel says that the Atari 2600 videogame machine started the whole boom in computers. And he says that many of the 20 million people who've bought Atari videogame machines are ready to upgrade.*





**Tramiel:** Anybody selling computers. You know what I say: 'Business is war.'

**FC:** What about in your price range? Do you see any Japanese competitors?

**Tramiel:** Japan is something I'm always afraid of. I have kept the Japanese out for a long time with my prices, and hope I can continue to keep them out.

**FC:** Do you plan on keeping a "think tank" atmosphere at Atari, with big names developing products?

**Tramiel:** No, we plan to have good people, who don't have to have well-known names. The old Atari didn't understand how to make a product. They understood how to spend money. They liked to spend money. They had big names, important people.

**FC:** Do you think you can make Atari come back as quickly as Iacocca made Chrysler come back?

**Tramiel:** I don't recall exactly how long it took him. But, I am convinced that we will go into the year 1985 in the black. That's less than six months work. Yes, we definitely are going to turn it around. There are a lot of differences between Chrysler and Atari, volume-wise and everything else. But it's the same challenge, and it's fun—to take something that was semi-bankrupt and turn it into a strong, profitable, major corporation.

**FC:** What about overseas—Australia, Canada, England, Germany, Japan . . . ?

**Tramiel:** . . . Kenya!

There's no question that Atari is a worldwide organization, with companies all over the world. I would say that business for the old Atari was about 70 percent in the U.S. and 30 percent overseas. I'd like to make it a minimum of 50 percent overseas, and I'll try for better.

I believe very much in having a strong international market. The world is round. When things are bad here, they are good somewhere else. So you don't rely only on one market. It's an international business, not a local business.

**FC:** Do you have sales projections or ideas about which markets will be best for you?

**Tramiel:** Yes, but not for publication. We have a very simple formula. Our business plans are always for 12 to 24 months out. But, we have only a 90-day firm manufacturing commitment. If, at any time, we see things back up on one product or increase on another, we can always change things in a 90-day span. In this business you have to be able to turn on a dime. You cannot be a battleship.

**FC:** During your reign at Commodore there was a high rate of returns on defective disk drives and computers. Do you feel there's any chance that will happen again at Atari in your push to be the low-cost producer?

**Tramiel:** The only thing I can tell you is that I own a fancy car called a Jaguar. And I've received four or five letters from the company asking me to return the car for certain problems. I read in the paper constantly that Mr. Iacocca sometimes calls back hundreds of thousands of cars. There isn't a product that isn't recalled for repairs.

I'm not going to say, 'No, it's not going to happen, it's going to be a perfect product!' That's not real. It doesn't make a difference if it's a Rolls-Royce. Just because it's a low-cost product doesn't mean there's more chance to fail.

**FC:** What does the name Atari mean to you, in terms of image?

**Tramiel:** Atari, to me, is the company that started the whole boom in computers. It was the most successful company, which got in with their product [*the Atari 2600 videogame machine*] to 20 million homes. Nobody else has done that. I believe that the world's youth has a love affair with the name. Atari's a household name all over the world, from Brazil to Mozambique. One of the strongest assets I bought from Warner was the name Atari.

**FC:** Do you have grandchildren, and do they use computers?

**Tramiel:** Yes. The 3-year-old uses it to play games. The 9-year-old uses it for homework in school. For all kinds of projects. And there's a 5-month-old baby who doesn't use it yet.

**FC:** What importance do you attach to telecommunications?

**Tramiel:** Very important. This is what I use to get all my stock information when I come home.


**FC:** Will you be doing anything to cut the cost of modems?

**Tramiel:** From the modems point of view, definitely yes. I do not control the telephone company as yet. As yet!

**FC:** What other areas do you see as important?

**Tramiel:** I definitely think that FM radio will become a very important factor in communications. Instead of using the phone lines, you're going to be able to use the FM airwaves. You'll be able to transmit a lot of information from computer to computer. You're going to be able to transport software through FM radio.

**FC:** Do you think that your reentry into the market means that in 1985 the home-computer industry will come back to life? Will people become excited again like they were two or three years ago?

**Tramiel:** Yes, because of what I can bring to the table—the right products, with my philosophy as far as price and features. Yes, the excitement will be there. 



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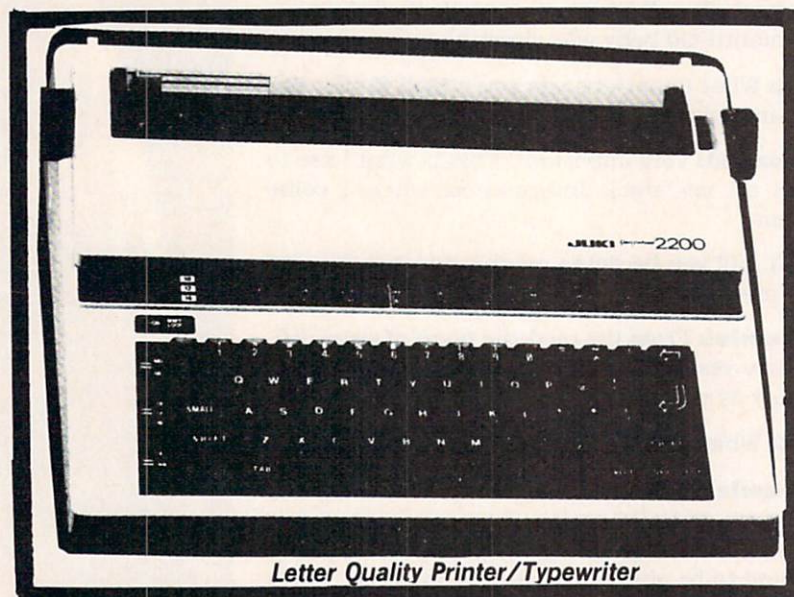
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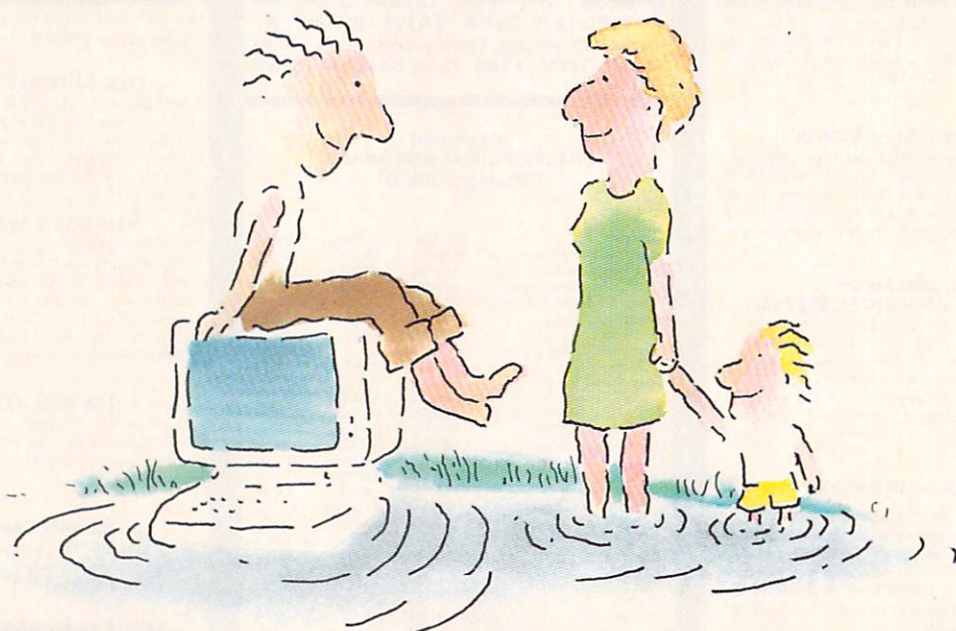
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# the Programmer

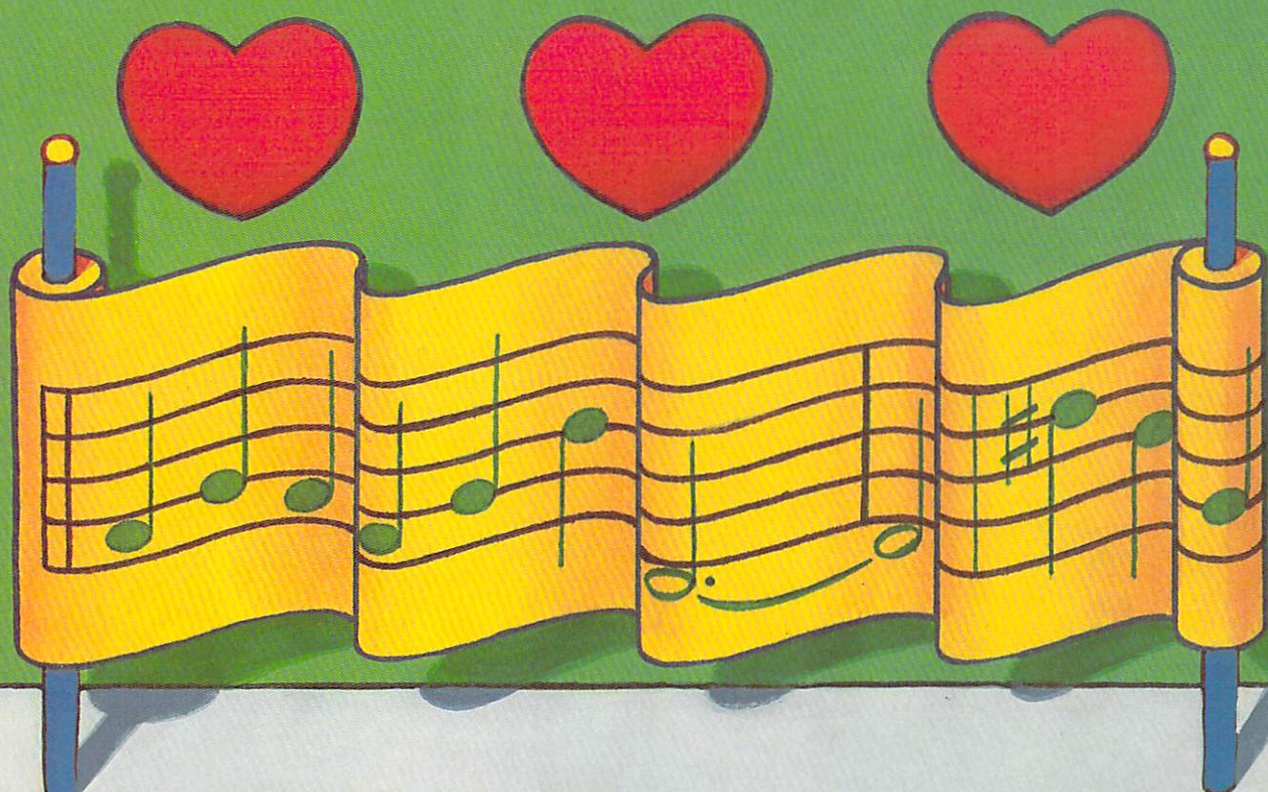


ILLUSTRATION BY MARTON STABLER

★

F E B R U A R Y

★

## WINTER PROGRAM

Page 62

Make your sweetie  
a high-tech  
Computer Valentine.

## PUZZLE

Page 72

Turn your computer  
into a piano.  
Then discover the  
musical key  
to get you out of  
a tight spot.

**PROGRAMMING P.S.** Page 70 Sorry, we goofed! Corrections to previous programs.

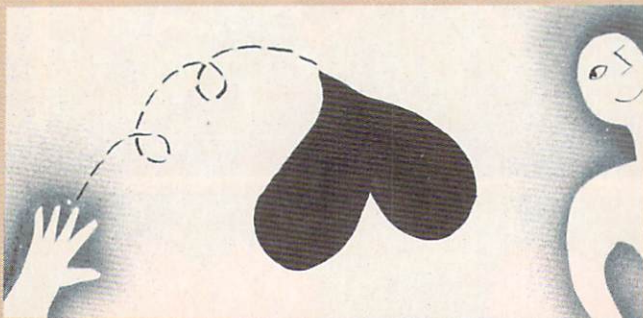
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Cherry



# COMPUTER VALENTINE

BY JOEY LATIMER



They say all's fair in love and war—so nowadays, when war is a game played by computers, shouldn't love be enhanced by high technology as well?

This Valentine's Day,

why not prove to your sweetie that computers aren't the cold machines they're cracked up to be. In fact, they're all heart, as our *Computer Valentine* amply demonstrates!

## ADAM/Computer Valentine

```

10 TEXT
20 HOME
30 PRINT TAB(7);"--COMPUTER VALENTINE--"
40 PRINT
50 PRINT "Press <RETURN> after"
60 PRINT "each reply."
70 PRINT
80 PRINT "Who is this?"
90 INPUT "valentine for?";n$
100 PRINT
110 INPUT "Who is it from?";f$
120 HOME
130 PRINT "Press any key, then go"
140 PRINT "get ";n$;f$;". "
150 GET r$
160 HOME
170 GR
180 COLOR= 15
190 FOR ro = 0 TO 39
200 HLINE 0,39 AT ro
210 NEXT ro
220 COLOR= 9
230 FOR co = 7 TO 20
240 READ a,b
250 VLINE a,b AT co
260 VLINE a,b AT 40-co
270 NEXT co
280 COLOR= 0
290 FOR x = 1 TO 6
300 READ a,b,ro
310 FOR co = b TO a STEP -1
320 PLOT co,ro
330 NEXT co,x
340 FOR x = 1 TO 4
350 READ ro,y
360 FOR co = y TO y+2
370 COLOR= co-y+7
380 PLOT co,ro
390 NEXT co,x
400 d$=""
410 FOR x = 1 TO 15
420 d$ = d$+"-x"
430 NEXT x

```

```

440 m$ = ", you turn my heart upside down! Will you be my Valentine? Love, "
450 m$ = d$+" "+n$+m$+f$+" "+d$
460 HOME
470 FOR x = 1 TO LEN(m$)-31
480 VTAB 22
490 PRINT MID$(m$,x,31)
500 FOR d = 1 TO 100:NEXT d
510 NEXT x
520 GOTO 470
1000 DATA 19,27,17,29,15,31,13,32,12,33,11
1010 DATA 34,10,35,9,35,8,35,7,34,6,33,5
1020 DATA 32,4,31,3,30,32,36,16,2,17,16,4,4
1030 DATA 14,3,4,15,3,4,17,4,4,18,14,35,15
1040 DATA 34,17,34,18,35

```

## Apple/Computer Valentine

```

10 TEXT
20 HOME
30 PRINT TAB(11);"--COMPUTER VALENTINE--"
40 PRINT
50 PRINT "PRESS <RETURN> AFTER EACH REPLY."
60 PRINT
70 INPUT "WHO IS THIS VALENTINE FOR?";N$
80 PRINT
90 INPUT "WHO IS IT FROM?";F$
100 HOME
110 PRINT "PRESS ANY KEY, THEN GO GET ";N$;F$;". ";
120 GET R$
130 HOME
140 GR
150 COLOR= 15
160 FOR RO = 0 TO 39
170 HLINE 0,39 AT RO
180 NEXT RO
190 COLOR= 9
200 FOR CO = 7 TO 20
210 READ A,B
220 VLINE A,B AT CO
230 VLINE A,B AT 40-CO
240 NEXT CO
250 COLOR= 0
260 FOR X = 1 TO 6
270 READ A,B,RO
280 FOR CO = B TO A STEP -1
290 PLOT CO,RO
300 NEXT CO,X
310 FOR X = 1 TO 4
320 READ RO,Y
330 FOR CO = Y TO Y+2
340 COLOR= CO-Y+8
350 PLOT CO,RO
360 NEXT CO,X
370 D$ = ""
380 FOR X = 1 TO 20
390 D$ = D$+"-x"
400 NEXT X
410 M$ = ", YOU TURN MY HEART UPSIDE DOWN! WILL YOU BE MY VALENTINE? LOVE, "
420 M$ = D$+" "+N$+M$+F$+" "+D$
430 HOME
440 FOR X = 1 TO LEN(M$)-40
450 VTAB 22
460 PRINT MID$(M$,X,40)
470 FOR D = 1 TO 85:NEXT D
480 NEXT X
490 GOTO 440
1000 DATA 19,27,17,29,15,31,13,32,12,33,11
1010 DATA 34,10,35,9,35,8,35,7,34,6,33,5
1020 DATA 32,4,31,3,30,32,36,16,2,17,16,4,4
1030 DATA 14,3,4,15,3,4,17,4,4,18,14,36,15
1040 DATA 35,17,35,18,36

```



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**Atari/Computer Valentine**

```

10 DIM N$(20),F$(20),D$(41),M$(225)
20 OPEN #1,4,0,"K:"
30 GRAPHICS 0
40 POSITION 10,0:PRINT "--COMPUTER VALENTINE--"
50 PRINT
60 PRINT "PRESS <RETURN> AFTER EACH REPLY."
70 PRINT
80 PRINT "WHO IS THIS VALENTINE FOR";
90 INPUT N$
100 PRINT
110 PRINT "WHO IS IT FROM";
120 INPUT F$
130 PRINT CHR$(125);"PRESS ANY KEY, THEN GO GET ";N$;"
 ";
140 GET #1,K
150 GRAPHICS 3
160 SETCOLOR 0,5,6
170 SETCOLOR 1,0,0
180 SETCOLOR 2,0,15
190 SETCOLOR 4,0,15
200 COLOR 1
210 FOR C0=7 TO 17
220 READ A,B
230 PLOT C0,A
240 DRAWTO C0,B
250 PLOT 35-C0,A
260 DRAWTO 35-C0,B
270 NEXT C0
280 COLOR 2
290 PLOT 1,8
300 DRAWTO 15,8
310 PLOT 26,8
320 DRAWTO 35,8
330 COLOR 1
340 FOR C0=1 TO 3
350 PLOT C0,9-C0
360 DRAWTO C0,7+C0
370 NEXT C0
380 COLOR 2
390 FOR C0=31 TO 35 STEP 2
400 PLOT C0,7
410 PLOT C0,9
420 PLOT C0+1,6
430 PLOT C0+1,10
440 NEXT C0
450 D$=CHR$(0)
460 FOR X=1 TO 20
470 D$(LEN(D$)+1)="-"
480 D$(LEN(D$)+1)=CHR$(0)
490 NEXT X
500 M$=D$
510 M$(LEN(M$)+1)=""
520 M$(LEN(M$)+1)=N$
530 M$(LEN(M$)+1)=", YOU TURN MY HEART UPSIDE DOWN! W
 ILL YOU BE MY VALENTINE? LOVE, "
540 M$(LEN(M$)+1)=F$
550 M$(LEN(M$)+1)=""
560 M$(LEN(M$)+1)=D$
570 POKE 752,1
580 PRINT CHR$(125)
590 FOR X=1 TO LEN(M$)-40
600 POKE 656,1
610 POKE 657,0
620 PRINT M$(X,X+39);
630 FOR D=1 TO 20:NEXT D
640 NEXT X
650 GOTO 590
1000 DATA 13,16,11,18,9,19,7,19,6,19,5,19,4,19
1010 DATA 3,19,2,18,1,17,0,16

```

**Commodore 64/Computer Valentine**

```

10 SB=1024
20 CB=55296
30 POKE 53280,1
40 POKE 53281,1
50 PRINT CHR$(147);TAB(11);"--COMPUTER VALENTINE--"
60 PRINT
70 PRINT "PRESS <RETURN> AFTER EACH REPLY."
80 PRINT
90 INPUT "WHO IS THIS VALENTINE FOR";NS
100 PRINT
110 INPUT "WHO IS IT FROM";FS
120 PRINT CHR$(147);CHR$(31);"PRESS ANY KEY, THEN GO G
 ET ";NS;"."
130 GET RS
140 IF RS="" THEN 130
150 PRINT CHR$(147)
160 FOR C0=8 TO 19
170 READ A,B
180 FOR R0=A TO B
190 POKE SB+C0+R0*40,160
200 POKE CB+C0+R0*40,10
210 POKE SB+38-C0+R0*40,160
220 POKE CB+38-C0+R0*40,10
230 NEXT R0,C0
240 FOR X=1 TO 2
250 READ A,B,R0
260 FOR C0=B TO A STEP -1
270 POKE SB+C0+R0*40,160
280 POKE CB+C0+R0*40,0
290 NEXT C0,X
300 FOR X=1 TO 6
310 READ C0,R0,CH
320 POKE SB+C0+R0*40,CH
330 POKE CB+C0+R0*40,0
340 NEXT X
350 FOR X=1 TO 4
360 READ R0,Y
370 FOR C0=Y TO Y+2
380 K0=C0-Y+3
390 POKE SB+C0+R0*40,160
400 POKE CB+C0+R0*40,K0
410 NEXT C0,X
420 D$=CHR$(115)
430 FOR X=1 TO 20
440 D$=D$+"-"+CHR$(115)
450 NEXT X
460 M$=" YOU TURN MY HEART UPSIDE DOWN! WILL YOU BE
 MY VALENTINE? LOVE, "
470 M$=D$+" "+NS+M$+F$+" "+D$
480 POKE 214,22
490 PRINT
500 K0=INT(RND(1)*8)+149
510 FOR X=1 TO LEN(M$)-40
520 PRINT CHR$(K0);MID$(M$,X,40);CHR$(145);
530 FOR T=1 TO 85:NEXT T
540 IF RND(1)>.85 THEN K0=INT(RND(1)*8)+149
550 NEXT X
560 GOTO 510
1000 DATA 14,18,12,19,10,20,8,21,7,21,6,21,5,21
1010 DATA 4,21,3,20,2,19,1,18,0,17,29,36,11,1,17
1020 DATA 11,2,10,160,2,12,160,1,10,233,2,9,233
1030 DATA 1,12,95,2,13,95,9,35,10,34,12,34,13,35

```

**IBM PC w/Color Graphics Adapter & IBM PCjr/Com-  
puter Valentine**

```

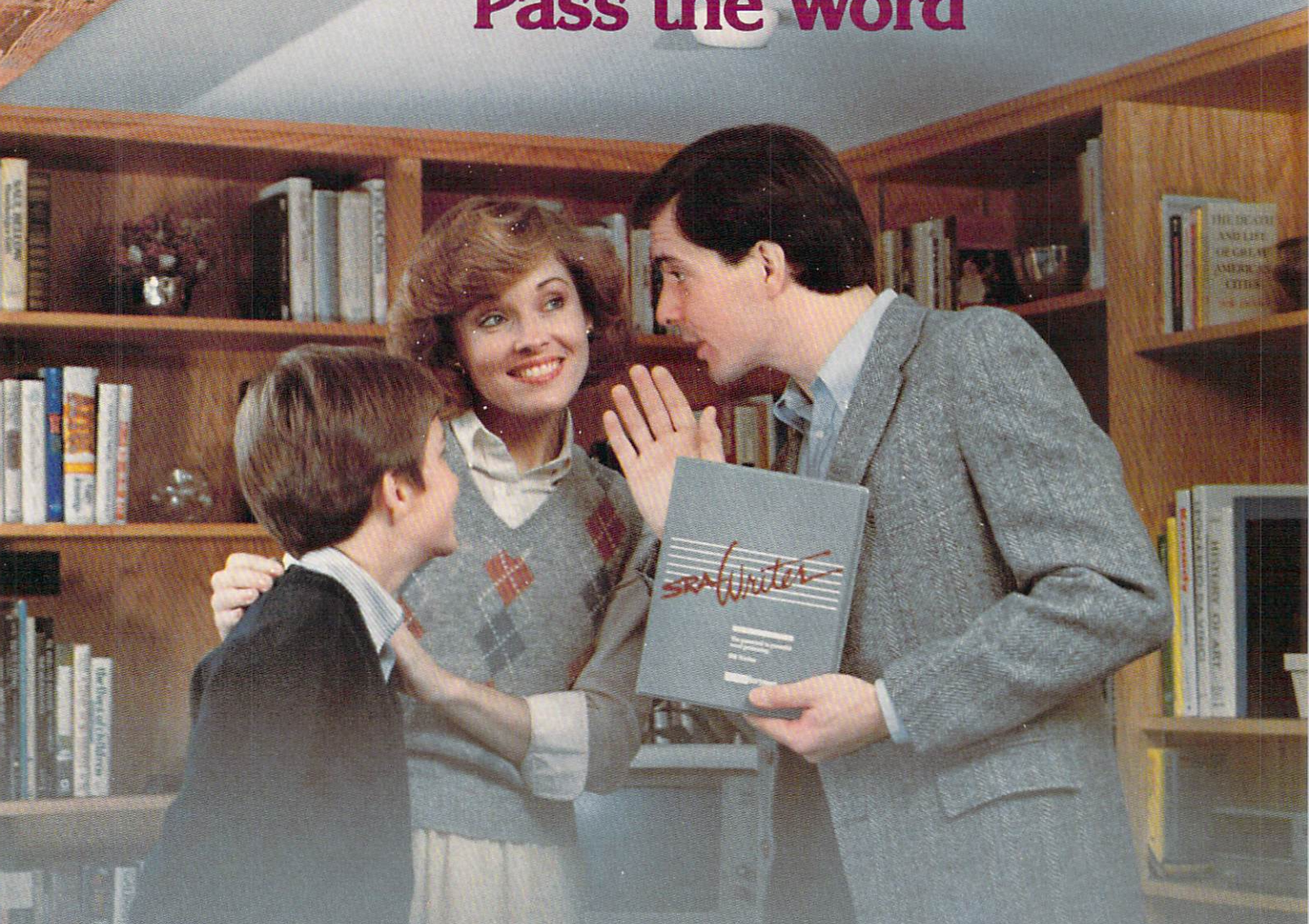
10 SCREEN 0,1
20 KEY OFF
30 WIDTH 40
40 CLS
50 PRINT TAB(11);"--COMPUTER VALENTINE--"
60 PRINT
70 PRINT "PRESS <ENTER> AFTER EACH REPLY."

```





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Word Processing

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## WINTER PROGRAM

```

80 PRINT
90 INPUT "WHO IS THIS VALENTINE FOR";NS
100 PRINT
110 INPUT "WHO IS IT FROM";FS
120 CLS
130 PRINT "PRESS ANY KEY, THEN GO GET ";NS;".
140 IF INKEY$="" THEN 140
150 COLOR 4,15
160 CLS
170 FOR CO=7 TO 20
180 READ A,B
190 FOR RO=A TO B
200 LOCATE RO,CO,0:PRINT CHR$(219)
210 LOCATE RO,40-CO,0:PRINT CHR$(219)
220 NEXT RO,CO
230 COLOR 0
240 FOR X=1 TO 6
250 READ A,B,RO
260 FOR CO=B TO A STEP -1
270 LOCATE RO,CO
280 PRINT CHR$(219)
290 NEXT CO,X
300 FOR X=1 TO 4
310 READ RO,Y
320 FOR CO=Y TO Y+3
330 COLOR CO-Y+7
340 LOCATE RO,CO
350 PRINT CHR$(219)
360 NEXT CO,X
370 DS=CHR$(3)
380 FOR X=1 TO 20
390 DS=DS+"-"+CHR$(3)
400 NEXT X
410 MS=", YOU TURN MY HEART UPSIDE DOWN! WILL YOU BE
MY VALENTINE? LOVE, "
420 MS=DS+" "+NS+MS+FS+" "+DS
430 KO=INT(RND*6)+1
440 FOR X=1 TO LEN(MS)-40
450 IF RND>.85 THEN KO=INT(RND*6)+1
460 COLOR KO
470 LOCATE 25,2
480 PRINT MID$(MS,X,38);
490 FOR D=1 TO 85:NEXT D
500 NEXT X
510 GOTO 440
1000 DATA 17,20,15,21,13,22,11,23,10,23,9,23,8,23
1010 DATA 7,23,6,22,5,21,4,20,3,19,2,18,1,17
1020 DATA 30,36,10,5,20,10,6,7,9,7,8,6,7,11,7
1030 DATA 7,12,9,33,8,34,11,33,12,34

```

### TRS-80 Color Computer/Computer Valentine

```

10 CLEAR 2000
20 CLS
30 PRINT TAB(6);"-COMPUTER VALENTINE-"
40 PRINT
50 PRINT "PRESS <ENTER> AFTER EACH REPLY."
60 PRINT
70 PRINT "WHO IS THIS"
80 INPUT "VALENTINE FOR";NS
90 PRINT
100 INPUT "WHO IS IT FROM";FS
110 CLS
120 PRINT "PRESS ANY KEY, THEN"
130 PRINT "GO GET ";NS;".
140 KS=INKEY$
150 IF KS="" THEN 140
160 CLS(0)
170 FOR CO=13 TO 33
180 READ A,B
190 FOR RO=A TO B
200 SET(CO,RO,4)
210 SET(67-CO,RO,4)

```

```

220 NEXT RO,CO
230 FOR X=1 TO 2
240 READ A,B
250 FOR CO=A TO B STEP -1
260 PRINT@CO,CHR$(207);
270 NEXT CO,X
280 FOR X=1 TO 14
290 READ CO,RO
300 SET(CO,RO,3)
310 NEXT X
320 FOR X=1 TO 4
330 READ RO,Y
340 FOR CO=Y TO 9+Y STEP 2
350 KO=RND(3)+5
360 SET(CO,RO,KO)
370 NEXT CO,X
380 DS="*"
390 FOR X=1 TO 16
400 DS=DS+"-*"
410 NEXT X
420 MS=", YOU TURN MY HEART UPSIDE DOWN! WILL YOU BE
MY VALENTINE? LOVE, "
430 MS=DS+" "+NS+MS+FS+" "+DS
440 FOR X=1 TO LEN(MS)-30
450 PRINT@481,MID$(MS,X,30);
460 FOR D=1 TO 110:NEXT D
470 NEXT X
480 GOTO 440
1000 DATA 18,20,17,21,16,22,15,23,14,24,13,24
1010 DATA 12,25,11,26,10,27,9,27,8,27,7,27,6,27
1020 DATA 5,27,4,27,3,27,2,27,2,25,1,24,1,23,0
1030 DATA 22,222,216,207,193,5,9,5,10,5,11,4,10
1040 DATA 4,11,3,11,3,14,4,14,4,15,5,14,5,15,5
1050 DATA 16,2,12,2,13,10,55,11,54,14,54,15,55

```

### TRS-80 Model III/Computer Valentine

```

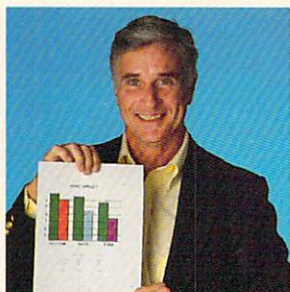
10 CLEAR 2000
20 CLS
30 PRINT TAB(23);"-COMPUTER VALENTINE-"
40 PRINT
50 PRINT "PRESS <ENTER> AFTER EACH REPLY."
60 PRINT
70 INPUT "WHO IS THIS VALENTINE FOR";NS
80 PRINT
90 INPUT "WHO IS IT FROM";FS
100 CLS
110 PRINT "PRESS ANY KEY, THEN GO GET ";NS;".
120 KS=INKEY$
130 IF KS="" THEN 120
140 CLS
150 FOR CO=13 TO 30
160 READ A,B
170 FOR RO=A TO B
180 PRINT@CO+RO*64,CHR$(191);
190 PRINT@61-CO+RO*64,CHR$(191);
200 NEXT RO,CO
210 FOR X=1 TO 2
220 READ A,B
230 FOR CO=B TO A STEP -1
240 SET(CO,19)
250 NEXT CO,X
260 FOR X=1 TO 4
270 READ CO,RO,CH
280 PRINT@CO+RO*64,CHR$(CH);
290 NEXT X
300 FOR X=1 TO 4
310 READ A,RO
320 FOR CO=A TO A+8 STEP 2
330 SET(CO,RO)
340 NEXT CO,X
350 DS="*"
360 FOR X=1 TO 32

```



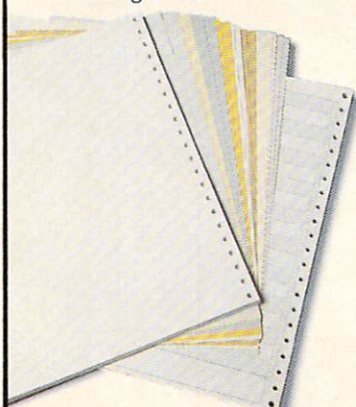
# COLOR

## The OKIMATE 10 Personal Color Printer's got it for \$238.\*



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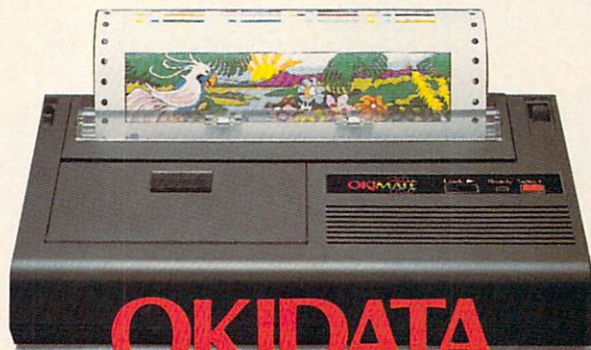
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## WINTER PROGRAM

```

370 D$=D$+"-*"
380 NEXT X
390 M$=" YOU TURN MY HEART UPSIDE DOWN! WILL YOU BE
MY VALENTINE? LOVE, "
400 M$=D$+" "+N$+M$+F$+" "+D$
410 FOR X=1 TO LEN(M$)-64
420 PRINT@896,MID$(M$,X,64);
430 FOR T=1 TO 40:NEXT T
440 NEXT X
450 GOTO 410
1000 DATA 9,10,8,11,8,11,7,12,6,12,6,13,5,13,5,13
1010 DATA 4,13,4,13,3,13,3,13,3,12,2,12,2,11,1,11,1
1020 DATA 11,90,113,16,57,9,5,176,8,6,174,9,7,131,9,6
1030 DATA 191,106,17,105,18,105,20,106,21

```

### TI-99/4A/Computer Valentine

```

10 DIM C(255)
20 FOR X=1 TO 6
30 READ F,CS,A$,CH
40 CALL COLOR(CS,F,16)
50 CALL CHAR(CH,A$)
60 NEXT X
70 CALL CLEAR
80 PRINT TAB(5);"-COMPUTER VALENTINE-"
90 PRINT
100 PRINT "PRESS <ENTER> AFTER EACH":"REPLY."
110 PRINT
120 PRINT "WHO IS THIS":"VALENTINE FOR? ";
130 INPUT N$
140 PRINT
150 PRINT "WHO IS IT FROM? ";
160 INPUT F$
170 CALL CLEAR
180 PRINT "PRESS ANY KEY, THEN":"GO GET ";N$;". "
190 CALL KEY(3,KEY,ST)
200 IF ST=0 THEN 190
210 CALL CLEAR
220 CALL SCREEN(16)
230 FOR CO=7 TO 16
240 READ RO,REP
250 CALL VCHAR(RO,CO,96,REP)
260 CALL VCHAR(RO,32-CO,96,REP)
270 NEXT CO
280 FOR X=1 TO 2
290 READ A,B
300 FOR CO=B TO A STEP -1
310 CALL HCHAR(9,CO,104)
320 NEXT CO
330 NEXT X
340 CALL VCHAR(8,4,128)
350 CALL VCHAR(10,4,136)
360 CALL HCHAR(8,28,152,3)
370 CALL HCHAR(10,28,144,3)
380 M$=" YOU TURN MY HEART UPSIDE DOWN! WILL YOU BE
MY VALENTINE? LOVE, "
390 M$=" "&N$&M$&F$&" "
400 FOR X=1 TO 28
410 M$=" "&M$&" "
420 NEXT X
430 FOR X=1 TO LEN(M$)
440 C(X)=ASC(SEG$(M$,X,1))
450 NEXT X
460 FOR I=30 TO LEN(M$)
470 FOR J=I-29 TO I
480 CALL HCHAR(24,30-(I-J),C(J))
490 NEXT J
500 NEXT I
510 GOTO 460
1000 DATA 9,9,FFFFFFFFFFFFFFFF,96
1010 DATA 2,10,FFFFFFFFFFFFFFFF,104
1020 DATA 2,13,0103070F1F3F7FFC,128
1030 DATA 2,14,FF7F3F1F0F070301,136

```

```

1040 DATA 6,15,C0E070381C0E0703,144
1050 DATA 6,16,03070E1C3870E0C0,152
1060 DATA 12,4,10,7,9,9,7,12,6,14,5,15,4,16
1070 DATA 3,16,2,16,1,16,24,30,4,15

```

### Timex Sinclair 1000 w/16K RAM Pack & 1500/Computer Valentine

```

10 LET D$="13,16,11,17,9,18,7,18,5,18,4,18,"
20 LET D$=D$+"3,17,2,16,1,15,21,27,3,14,3,7,135,"
30 LET D$=D$+"4,7,5,4,9,5,3,9,2,25,6,4,24,7,6,24,"
40 LET D$=D$+"9,134,25,10,1,"
50 LET P1=1
60 LET P2=3
70 PRINT TAB 7;"-COMPUTER VALENTINE-"
80 PRINT
90 PRINT "PRESS <ENTER> AFTER EACH REPLY."
100 PRINT
110 PRINT "WHO IS THIS";AT 5,0;"VALENTINE FOR? ";
120 INPUT N$
130 PRINT N$
140 PRINT "WHO IS IT FROM? ";
150 INPUT F$
160 PRINT F$
170 PAUSE 100
180 CLS
190 PRINT "PRESS ANY KEY, THEN";AT 1,0;"GO GET ";N$;". "
"
200 PAUSE 40000
210 CLS
220 FAST
230 FOR C=7 TO 15
240 GOSUB 1000
250 LET A=D
260 GOSUB 1000
270 FOR R=A TO D
280 PRINT AT R,C;CHR$ 136;AT R,31-C;CHR$ 136
290 NEXT R
300 NEXT C
310 FOR X=1 TO 2
320 GOSUB 1000
330 LET A=D
340 GOSUB 1000
350 FOR C=D TO A STEP -1
360 PRINT AT 8,C;CHR$ 128
370 NEXT C
380 NEXT X
390 FOR X=1 TO 4
400 GOSUB 1000
410 LET C=D
420 GOSUB 1000
430 LET R=D
440 GOSUB 1000
450 PRINT AT R,C;CHR$ D
460 NEXT X
470 FOR X=1 TO 4
480 GOSUB 1000
490 LET A=D
500 GOSUB 1000
510 LET R=D
520 GOSUB 1000
530 FOR C=A TO A+3
540 PRINT AT R,C;CHR$ D
550 NEXT C
560 NEXT X
570 LET E$="*"
580 FOR X=1 TO 16
590 LET E$=E$+"*"
600 NEXT X
610 LET M$=" YOU TURN MY HEART UPSIDE DOWN. WILL YOU
BE MY VALENTINE? LOVE, "
620 LET M$=E$+" "+N$+M$+F$+" "+E$
630 SLOW
640 FOR X=1 TO LEN M$-32

```





# Help Agent U.S.A. stop the fuzz plague. And you can win a trip to Washington, D.C.

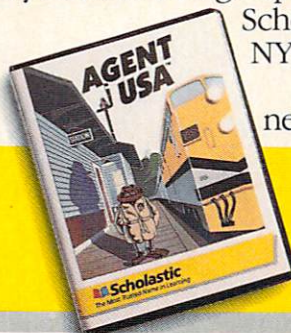
The FuzzBomb is turning millions of men, women and children into mindless fuzzbodies. And Agent U.S.A. can't stop the devious plague spreader without your help.

But don't accept the assignment unless you're really prepared to stretch your mind. Because sharp eyes and quick reflexes aren't enough to stop the fuzz plague. You'll have to outthink and outplan the FuzzBomb as you pursue him around the country in super-fast rocket trains. And you'll have to remember state capitals, learn the time zones and figure out the quickest routes across the nation. If you don't, the fuzzbodies will turn you into one of them.

Become one of the few super-agents to defeat the FuzzBomb and you may win a trip to intelligence headquarters in Washington, D.C. What's more, even if you never catch the evil one, tell us what you like about the game and you can become an instant winner of an Agent U.S.A. knapsack (see package for contest details).

Agent U.S.A. needs you now. So sign up where you usually buy your software. Or write to Scholastic Inc., Dept. EW, 730 Broadway, New York, NY 10003.

Do it before the fuzz plague comes to your neighborhood!



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## WINTER PROGRAM

```
650 PRINT AT 20,0;M$(X TO 31+X)
660 NEXT X
670 GOTO 640
1000 IF D$(P2)="," THEN GOTO 1030
1010 LET P2=P2+1
1020 GOTO 1000
1030 LET D=VAL D$(P1 TO P2-1)
1040 LET P1=P2+1
1050 LET P2=P1+1
1060 RETURN
```

### VIC-20/Computer Valentine

```
10 SB=7680
20 CB=38400
30 POKE 36879,25
40 PRINT CHR$(147);" -COMPUTER VALENTINE-"
50 PRINT
60 PRINT "PRESS <RETURN> AFTER","EACH REPLY."
70 PRINT
80 PRINT "WHO IS THIS VALENTINE"
90 INPUT "FOR";NS
100 PRINT
110 PRINT "WHO IS IT"
120 INPUT "FROM";FS
130 PRINT CHR$(147);CHR$(31);"PRESS ANY KEY, THEN"
140 PRINT "GO GET ";NS;"."
150 GET RS
160 IF RS="" THEN 150
170 PRINT CHR$(147)
180 FOR C0=3 TO 10
190 READ A,B
200 FOR R0=A TO B
210 POKE SB+C0+R0*22,160
220 POKE CB+C0+R0*22,2
230 POKE SB+20-C0+R0*22,160
240 POKE CB+20-C0+R0*22,2
250 NEXT R0,C0
260 FOR X=1 TO 2
270 READ B,A
280 FOR C0=B TO A STEP -1
290 POKE SB+C0+9*22,160
300 POKE CB+C0+9*22,0
310 NEXT C0,X
320 POKE 7857,233
330 POKE 38577,0
340 POKE 7901,95
350 POKE 38621,0
360 FOR X=1 TO 4
370 READ R0,Y
380 FOR C0=Y TO Y+2
390 K0=C0-Y+4
400 POKE SB+C0+R0*22,160
410 POKE CB+C0+R0*22,K0
420 NEXT C0,X
430 D$=CHR$(115)
440 FOR X=1 TO 11
450 D$=D$+"-"+CHR$(115)
460 NEXT X
470 M$="," YOU TURN MY HEART UPSIDE DOWN! WILL YOU BE
MY VALENTINE? LOVE, "
480 M$=D$+" "+NS+M$+FS+" "+D$
490 K0=INT(RND(1)*3)+30
500 POKE 214,20
510 PRINT
520 FOR X=1 TO LEN(M$)-22
530 IF K0=32 THEN K0=28
540 PRINT CHR$(K0);MID$(M$,X,22);CHR$(145);
550 FOR T=1 TO 85:NEXT T
560 IF RND(1)>.85 THEN K0=INT(RND(1)*3)+30
570 NEXT X
580 GOTO 520
1000 DATA 11,14,9,15,8,16,6,17,5,17,4,16,3,15
1010 DATA 2,14,19,16,9,1,7,19,8,18,10,18,11,19
```

### TIPS TO THE TYPIST

1. When you type program lines into your computer, be sure to copy them *exactly* as written. Numbers, punctuation marks, and spaces are very important!
2. Remember to press RETURN or ENTER *after* every completed program line.
3. Run the program when you finish typing it in by typing RUN and pressing the RETURN or ENTER key. If the computer gives you an error message, don't panic. Mistakes can be fixed. List the program by typing the word LIST and

pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.

4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.
5. When all else fails . . . turn off the computer and relax.

## PROGRAMMING P.S.

### Corrections to Previous Months' Programs

#### Apple/Mailing List (November 1984, page 102)

A space is missing between the quotation marks in line 60, which stops the last letter of each of your field names from displaying on the screen. Here is the correct version of line 60:

```
60 FOR I = 0 TO 4:READ TS:FIS(I) = TS+": ":NEXT I
```

#### Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Cornucopia (November 1984, page 90)

The cornucopia will not show up on your screen if you have put your Timex into FAST mode before running the program. To make sure the program will RUN correctly regardless of the mode your computer's in, add line 205:

```
205 SLOW
```

#### Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Holiday Update (November 1984, page 82)

This program will not run correctly if you have put your Timex into FAST mode before running it. To make sure the program will run correctly regardless of the mode the computer's in, add line 10:

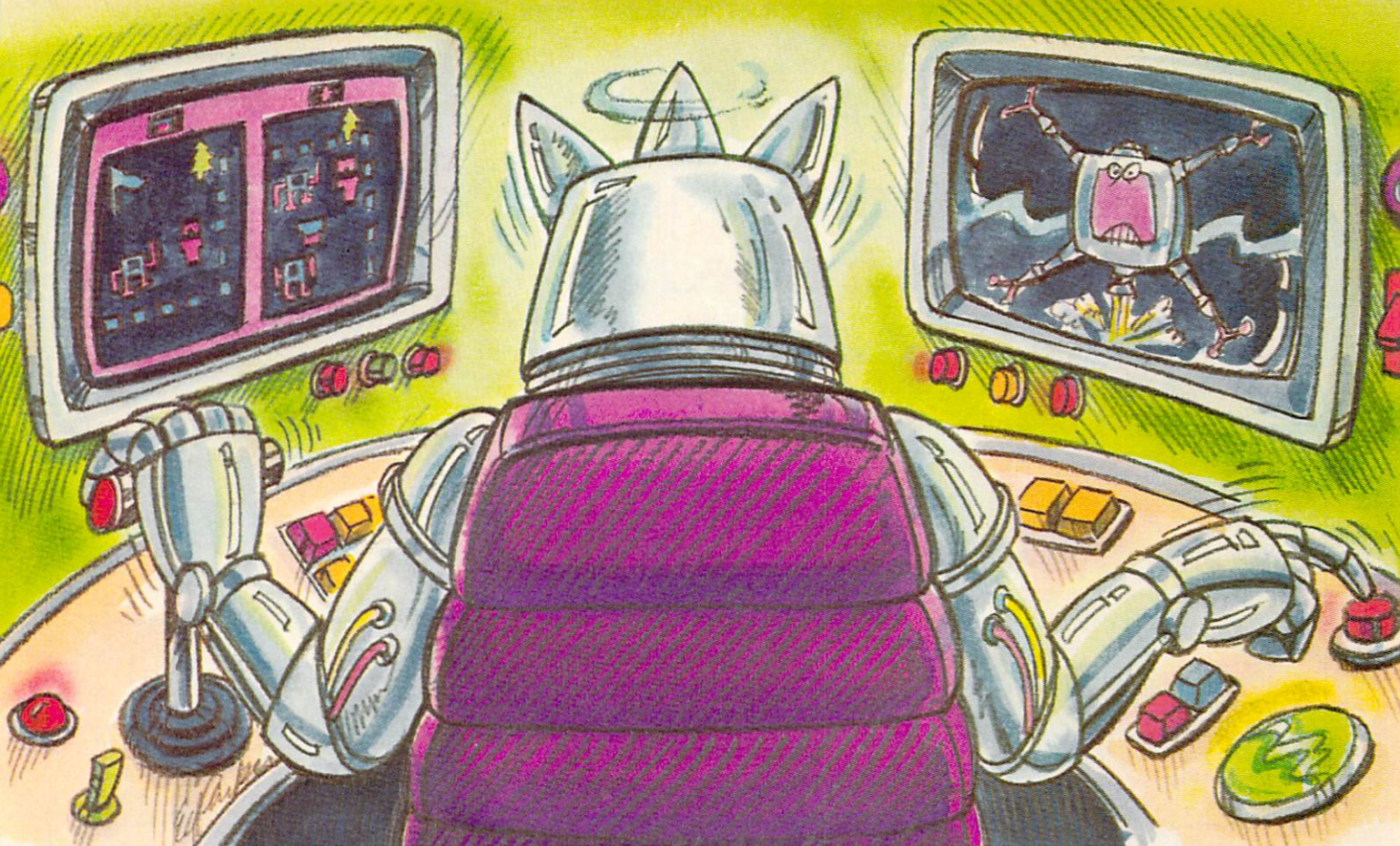
```
10 SLOW
```

#### VIC-20/Supermarket Sweethearts (January 1985, page 86)

Line 470 is incorrect as it appears in the modification box for the VIC version. Here is how it should read:

```
470 FOR D=1 TO DUR(I)*75:NEXT D:POKE 36876,0:NEXT I:END
```





# Show us the face of Max the Master Robot. And you may win your own talking robot.

**Team up with a friend to defeat Max and his robot raiders in Bannercatch.**

Only a handful of people have ever seen the face of the robot leader Max. Defeat Max and his demon robots and you'll join this elite group. And you and your teammate can win two walking, talking robots you can program yourself.

You'll battle Max and his robot marauders in a field bigger than any you've ever seen. Your team must invade robot territory and grab their flag before they take yours. But be careful; Max has devised a fiendish strategy against you. And, of course, you can't expect mercy from robots.

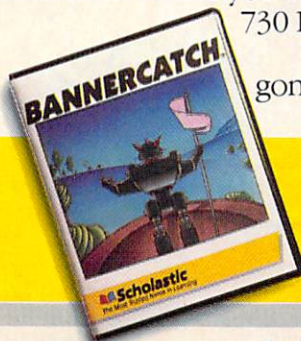
To make things even tougher, Max has taken a vow not to reveal his face until you conquer all his robots. Including Zweli the Invisible.

You'll need to learn binary numbers, map reading and, above all, how to work with your teammate if you want to win. But even if you go down to defeat, you may win two tickets to your favorite local sports event. See the package for contest details.



You can pick up Bannercatch where you buy software. Or write to Scholastic Inc., Dept. EW, 730 Broadway, New York, NY 10003.

But please remember, only a handful of people have gone face-to-face against Max and survived.



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# A MUSICAL DEPARTURE

## Turn Your Computer Into a Piano; Then Discover the Secret

**PUZZLE BY PETER FAVARO AND SARAH KORTUM**  
**PROGRAM BY STEVEN C.M. CHEN**

*If you're a music fan but not a puzzle fan, you can still use this program to play music on your computer's keyboard. See directions under "Computer Piano."*

Every big company has its superstar, and American Snacktime, Inc. is no exception. They call Bart Bricker "General Jingle" for his ability to create catchy lyrics that advertise AMSNAX's line of patriotic goodies. No decent TV-watching American could possibly forget Bart's jingle for Uncle Sam's Sugar-Free Dentally Hygienic Snack Bars: "It's a Grand Old Snack" (to the tune of "You're a Grand Old Flag").

*It's a grand old snack,  
Meant to remove the  
plaque  
From your teeth, from your  
mouth, from your  
gums—  
Just one tasty chew,  
Keeps your breath fresh,  
too!  
Take some with you to  
share with your chums  
And the fun won't stop,  
As your dentist's bills drop  
Uncle Sam's keeps your  
teeth so bright!  
So rush right out, and buy  
a bar,  
And give Uncle a great big  
bite!*

Bart's gift for writing jingles came naturally, but when there was a particularly challenging new project to be done, Bart relied

PETER FAVARO and SARAH KORTUM are contributing editors, and STEVEN C.M. CHEN is a contributing technical editor to FAMILY COMPUTING.





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3MOV2

## PARTY QUIZ

# Best kept secret of the season

## Computer gamers play PQ for hours

by Tom Benford

What's a PQ, you ask? See—I told you it was the best-kept secret! PQ stands for *Party Quiz*, a computer-trivia game from Suncom Inc.

PQ is a social trivia game that allows up to four players to participate simultaneously. Each player uses a controller to respond directly to the trivia questions on the screen.

Recently, a couple of friends, Chuck and Joan, stopped over to visit. I had just received my review copy of PQ that afternoon, and I decided to "boot-up" the program and see just how social this game really was. I couldn't have picked a better couple to participate in an "acid test"—Chuck hates board-type trivia games, and Joan absolutely loathes computers, although she likes trivia questions.

Setting up the game was easy. Each set comes with 2700 "general" questions. Suncom will be offering additional question disks covering specific categories including Sports, Entertainment, a "Bible Edition", and General Edition 2 which expands your inventory of general questions. I received the Commodore/Atari version, although *Party Quiz* is also available for the Apple and will be available soon for the IBM-PC.

After offering my guests beverages and excusing myself to fetch their drinks, I slipped into my study and loaded the game. Returning, I casually asked, "Which country was the first to issue postage stamps and what was the year?" Joan quickly answered, "Great Britain in 1840; now ask me a hard one!" My plan was working; we were on the subject of trivia. I mentioned that I had just received PQ that day, and I was wondering if they'd like to try answering some of the questions asked by the computer. We gravitated into my study.

I handed controllers to Joan and Chuck. My wife, Liz, and I manned the third and fourth. I explained that the computer would display a question,

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PQ: First "social" computer entertainment

along with four possible answers which were numbered 1-4. The rules were simple: select the right answer and press the corresponding button on the controller. Joan mumbled something about being a klutz, but she took the controller anyway, eyeing it suspiciously.

After Joan answered the first two questions correctly, I suspected that I was being set-up here; for a "klutz" who hated computers, she was doing very well. She missed on the third question, but Chuck answered correctly. Liz answered the next few questions correctly, and then finally, I got one right. It's not every day I get to look like a dummy in front of my friends!

We spent hours playing Party Quiz and all had a great time playing! The questions covered a myriad of topics, from the color of the Lone Ranger's pants to whether the first footprint on the moon was from a right or left foot.

It had been a special evening, indeed! It's not often that I get the chance to use "non-computing" people for play-testing a new product, and even rarer when I can have my friends actively participate in a computer-based game. We're even considering throwing a PQ Party one of these weekends!

As they were departing for home, Joan mentioned that it was about time she bought a computer for her son to do his schoolwork on. Who's she kidding? Not me—I know she's going to buy one to play Party Quiz on!

As I mentioned at the beginning of this piece, PQ is probably the best-kept secret of this Christmas season, at least for now. If you know someone who has a home computer, and/or is a trivia buff, why not pick up a copy of Party Quiz—it makes a perfect Christmas gift. But you'd better hurry while you can still get one—you know how hard it is to keep things a secret at this time of year!

PQ is available at your favorite local computer retailer. To locate the dealer nearest you, call toll free 1-800-323-8341. (In Illinois 1-312-459-8000).

Tom Benford is Associate Editor of Run Magazine, Technical Director of Electronic Games Magazine and a frequent contributor to Video and In-Cider magazines.

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on the approval of his faithful and loving consultants: Spangles the cat and Ulysses the dog (named for Ulysses S. Grant Mints, the product Bart wrote his favorite jingle for) to guide him in the right direction. When Bart came up with a pleasing jingle, Ulysses would howl his approval and Spangles would meow her gracious compliments.

Usually, Spangles and Ulysses got along wonderfully, but occasionally Ulysses' rheumatism got the better of him and the fur would fly. So when Bart went on business trips, he left the care of his pets and his house to Sam, a local youngster. Sam loved animals, but he especially enjoyed taking care of Spangles and Ulysses because it let him poke around in Bart's wonderful house. Bart was a collector of musical memorabilia, and his house was filled with tony and tuneful knickknacks. There were music notes and staffs on everything: the walls, the drinking glasses, even the guest towels. But Sam knew that the largest collection was in Bart's office, the private room where he composed all of his jingles for AMSNAX. Unfortunately, it was the only part of the house that Sam couldn't enter.

As a precaution against theft, Bart used a special musical lock to secure his office. Each key on the lock's keypad played a different musical note, and one could enter or leave the little room only if one played the tune the keypad was currently programmed to accept. Bart changed the tunes weekly, often using jingles from his favorite commercials. But as he was absent-minded, he always left some clue in his office to remind himself of the current tune.

As an additional precaution, anyone sneaking around in Bart's office would trip a weight sensor in the floor that set off an ear-piercing alarm. Spangles and Ulysses didn't weigh enough to trip the

sensor and could enter and leave Bart's office at will, through a swinging "pet door" too tiny for adults.

On one particular pet-sitting occasion, the last day found Sam noticing that Spangles was in a frisky mood. After failing to engage a sleepy Ulysses in a game of tag, she waited until he fell asleep on top of the piano bench. Then she leaped hard onto the piano keys, scaring Ulysses half to death. The war was on!

Ulysses jumped to his feet and chased Spangles through the pet door into Bart's office. Peering through the little door, Sam watched in horror as the two animals started shredding Bart's sheet music. If he didn't get in there soon, Sam knew that the office would be wrecked! Taking a deep breath, he compressed his tiny body and slipped through the pet door.

Sam's 70 pounds immediately tripped off the sensor alarm, creating a racket that was sure to bring the local police. Sam knew that he had to discover the current keypad jingle—and quick! Frantically, he looked around the room for some clue to the current tune.

### HOW TO PLAY

Set your computer to all uppercase letters (except if it's an ADAM) before playing. When you RUN the program, you'll hear the sound of the alarm, and a keypad like the one on Bart's door will appear on the screen. You can play tunes on this keypad by pressing the top letter and number keys (Q2W3ER5T6Y7UI9O0P) on your computer's keyboard, producing corresponding notes as shown below.

You must discover what tune Bart has programmed the keypad to accept. To test a tune, play it on the keypad, then press RETURN or ENTER. If you've guessed right, the alarm will stop, the door will open, and you'll be treated to the full words and mu-

sic of the current keypad jingle. The keypad will then reappear on your screen, and you can play your favorite tunes to your heart's content without being bothered by that nasty alarm.

If you're stuck, press "H" for a helpful hint. The solution will appear in next month's issue.

### COMPUTER PIANO

Retype line 140 (line 80 for Atari, line 380 for TI), omitting REM. For example, on all versions except the Atari and TI, you would just type 140 GOTO 490 and press RETURN or ENTER. Then, when you RUN the program, it will branch directly to the keypad routine.



TO PLAY: C D E F# G A B C D E  
PRESS: Q 2 W 3 E R 5 T 6 Y 7 U I 9 O 0 P

### ADAM/A Musical Departure

```

10 LOMEM: 29000:NORMAL:v = 3
20 DIM a$(4),l$(8),v$(v),ka(18,2),kb(43,2),f(3)
30 dl = 1200:ds = 50:tx = 1:tru = 1:wh = 18:wl = 31
40 e$ = " <RETURN> ":r$ = "!":s$ = " "
50 x$ = " ":lm = (wl-29)/2+tx
60 b = 28000:FOR i = b TO b+5:READ a:POKE i,a:NEXT i
70 FOR i = 159 TO 223 STEP 32:POKE b+6,i:CALL 28000:NE
XT i
80 ds$ = "":FOR i = 1 TO 10:READ a$:d$ = d$+a$:NEXT i
90 FOR i = 1 TO v:v$(i) = "":FOR j = 1 TO 10:READ a$
100 v$(i) = v$(i)+a$:NEXT j,i:FOR i = 1 TO 18
110 FOR j = 1 TO 2:READ ka(i,j):NEXT j,i:FOR i = 1 TO
43:FOR j = 1 TO 2:kb(i,j) = 0
120 NEXT j,i:FOR i = 1 TO 4:READ a$(i):NEXT i:FOR i =
1 TO 17:FOR j = 1 TO 2
130 kb(ASC(MID$(a$(4),i,1))-47,j) = ka(i+1,j):NEXT j,i
140 REM GOTO 490
150 FOR i = 1 TO 8:t$ = "":READ k:FOR j = 1 TO k:READ
a$
160 q = ASC(LEFT$(a$,1))-64:FOR z = 2 TO LEN(a$)
170 n = ASC(MID$(a$,z,1))-q
180 t$ = t$+CHR$(n+tru*26*(n < 65)):NEXT z:t$ = t$+" "
190 NEXT j:l$(i) = LEFT$(t$,LEN(t$)-1):NEXT i
200 HOME
220 n$ = "The alarm is ringing!":GOSUB 1000
230 n$ = "Can you stop it?":GOSUB 1000:GOSUB 3000
240 PRINT:z$ = "Press"+e$+"to see if your tune stops"
250 z$ = z$+" the alarm or <H> for hint.":GOSUB 2000
260 POKE b+6,226:CALL 28000:POKE b+6,240:CALL 28000
270 GOSUB 6000:POKE b+6,255:CALL 28000
280 IF k$ = CHR$(13) THEN 320
290 ON ABS(k$ = "H") GOTO 310:GOSUB 4000
300 x$ = MID$(x$,2,7)+k$:GOTO 260
310 HOME:PRINT:z$ = l$(1):GOSUB 5000:GOTO 200
320 HOME:IF x$ = l$(8) THEN 340
330 z$ = "Nope! Play it again, Sam.":GOSUB 5000:GOTO 2
00
340 HOME:z$ = "The alarm stops, and the door"
350 z$ = z$+" magically opens!":GOSUB 2000:PRINT:PRINT
360 FOR d = 1 TO dl:NEXT d:HOME:c = 2
380 FOR s = 1 TO 49
390 IF s <> 1 AND s <> 15 AND s <> 23 AND s <> 30 AND
s <> 37 AND s <> 44 THEN 410
400 z$ = l$(c):GOSUB 2000:c = c+1:GOTO 420
410 FOR d = 1 TO ds:NEXT d
420 FOR i = 1 TO 3:f = ASC(MID$(v$(i),s,1))-64
430 POKE b+6,ka(f,1)+32*(i-1):CALL 28000
440 POKE b+6,ka(f,2):CALL 28000:NEXT i
450 FOR i = 144 TO 208 STEP 32:POKE b+6,i:CALL 28000

```



# ANNOUNCING

# FAMILY COMPUTING'S 1ST

## "COMPUTING FAMILY OF THE YEAR" CONTEST

### OTHER PRIZES:

**First Prize:** A complete computer system.  
**Second Prize:** A printer. **Third Prize:** A monitor.  
**Fourth Prize:** Awards worth \$250 each—including modems, graphics tablets, joysticks, light pens, software, books, disks, and computer accessories.

We're launching a nationwide search for the "Computing Family of the Year." Your family could be the winner! You could be featured in the pages of FAMILY COMPUTING, plus enjoy a fun-filled trip to a luxurious Club Med resort!! (One that has computers, of course!) Or, you could win a new, complete computer system, useful peripherals for your computer, or lots of exciting, useful software for your home!!

Who's eligible? Any family that uses its computer in especially efficient, rewarding, or creative ways! You could enter your family, your neighbor, your best friend, your teacher, or even your Little League coach! Write and tell us who you nominate for our "Computing Family of the Year."

All you have to do is follow the contest rules and answer the questions below:

1. Describe the most efficient, rewarding, and/or creative ways the family uses its computer. If software is used, tell us which kinds.
2. Explain the ways each family member uses the computer. List their names and ages.
3. Does the family ever use the computer together? To do what?

4. When and why did the family decide to buy a computer? What kind of computer did the family buy?

5. Has the computer lived up to its original expectations? Has its use evolved with time?

6. In what ways has the computer most benefited the family?

7. Do the children use a computer in school? Is the computer at home used for educational purposes? If so, how?

Also, we'd love to see a family photo—computing, of course. (A casual snapshot will do.)

### CONTEST RULES:

1. You must submit at least 1,000 words, but not more than 2,000. Send typed manuscripts or computer printouts, if possible.

2. Scholastic Inc. employees and advisory-board members, and members of their families, are not eligible.

3. All entries and photographs become the property of Scholastic Inc., which reserves the right to use them in publications and promotions. Unfortunately, Scholastic Inc. will not be

able to acknowledge your entries. Entries and photographs will not be returned.

4. You must include your address and phone number (and if you are nominating another family, you must also include its address and phone number).

5. A maximum of four family members are eligible for the Club Med vacation.

6. No cash substitutions for prizes.

### HOW TO ENTER:

Nominating letters should be mailed to Suzette Harvey, "Computing Family of the Year Contest," FAMILY COMPUTING, Scholastic Inc., 730 Broadway, New York, NY 10003.

**Judges:** All entries will be judged by a panel of Scholastic employees. **Deadline:** All entries must be postmarked by March 15, 1985. **Winners:** The winners will be announced in the September 1985 issue of FAMILY COMPUTING.

**COMPANIES CONTRIBUTING PRIZES:** Activision, Advanced Ideas, American Educational Computer, Avant-Garde, Amdek, Arrays/Continental, Atari, Avalon Hill, BHT Group, Brady, Broderbund, Cardco, CBS, Club Med, Coleco, Commodore, Creative Software, Datamost, DesignWare, dithium Press, Electronic Arts, Epyx, Ergo Systems, Eric Software, First Star, Fuji, Futurehouse, Gamestar, Harper & Row, HesWare, Human Edge, Imagic, Infocom, Koala, The Learning Co., Maxwell, Maximus, MECA, Micro Lab, Microsoft Press, Mindscape, Monogram/Tronix, Okidata, Peachtree Software, Penguin, Personal Peripherals, Prentice-Hall, Random House, Recoton, Reston, Howard W. Sams, Scarborough, Scholastic Software, Screenplay, Smith-Corona, Springboard, Star Micronics, subLOGIC Communications, Suncom, Synapse, Taxan, Woodbury.

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```

460 NEXT i:FOR d = 1 TO VAL(MID$(d$,s,1))*200:NEXT d
470 FOR i = 159 TO 223 STEP 32:POKE b+6,i
480 CALL 28000:NEXT i:NEXT s
490 HOME:GOSUB 3000
500 GOSUB 6000
510 GOSUB 4000:GOTO 500
1000 IF LEN(n$) = WL THEN PRINT n$;:RETURN
1010 PRINT TAB((WL-LEN(n$))/2+TX);n$;:RETURN
2000 IF LEN(z$) <= WL THEN n$ = z$:GOSUB 1000:RETURN
2010 j = WL+1:k = 1:FOR i = j TO 2 STEP -1
2020 IF MID$(z$,i,1) = " " THEN k = 0:j = i:i = 2
2030 NEXT i:n$ = LEFT$(z$,j-1):GOSUB 1000
2040 z$ = RIGHT$(z$,LEN(z$)-j+k):GOTO 2000
3000 PRINT:FOR i = 1 TO 8:PRINT TAB(LM);:INVERSE
3010 IF i <> 6 THEN PRINT s$;s$:GOTO 3040
3020 FOR j = 1 TO 9:PRINT MID$(a$(2),j,1);s$;r$;
3030 NEXT j:PRINT "P";s$:GOTO 3080
3040 FOR j = 1 TO 9:kc = ASC(MID$(a$(3),j,1))
3050 IF i > 6 OR kc = 88 THEN PRINT r$;:GOTO 3070
3060 NORMAL:PRINT CHR$(32+(kc-32)*(i = 5));:INVERSE
3070 PRINT s$;s$:NEXT j:PRINT
3080 NORMAL:NEXT i:PRINT TAB(LM);:FOR j = 1 TO 10
3090 PRINT MID$(a$(1),j,1);" ";:NEXT j:PRINT:RETURN
4000 IF k$ = CHR$(3) THEN END
4010 IF k$ < "0" OR k$ > "Y" THEN RETURN
4020 k = ASC(k$)-47:IF kb(k,1) = 0 THEN RETURN
4030 POKE b+6,kb(k,1):CALL 28000:POKE b+6,kb(k,2):CALL
28000
4040 POKE b+6,144:CALL 28000:FOR d = 1 TO 100:NEXT d
4050 POKE b+6,159:CALL 28000:RETURN
5000 GOSUB 2000:FOR i = 1 TO WH:PRINT:NEXT i
5010 z$ = "Press any key to continue.":GOSUB 2000
5020 GOSUB 6000:RETURN
6000 GET k$:IF k$ < "a" THEN RETURN
6010 k$ = CHR$(ASC(k$)-32):RETURN
7000 DATA 58,102,109,211,255,201
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIGF,INPRR,RPNNP,PNMN
8040 DATA FFFDD,BFIMN,NMMIL,JGGGJ,KJGKF
8050 DATA GFBDDB,FFDDB,FIMMN,MMILK,KIII
8060 DATA BBBAA,BBFI,IIIFI,FBGGG,GGGBB
8070 DATA BBBBA,BBAAB,BFIII,IIIFI,GGG
8080 DATA 135,28,141,26,133,25,142,23,137,22,133,21
8090 DATA 129,20,143,18,142,17,142,16,143,15,129,15
8100 DATA 131,14,134,13,138,12,143,11,132,11,138,10
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LRXQF,NHVS,FLXKYNTKY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```

### Apple/A Musical Departure

```

10 NORMAL:V = 1
20 DIM A$(4),L$(8),V$(V),KA(18),KB(43)
30 DL = 1200:DS = 20:TX = 1:TRU = 1:WH = 20:WL = 40
40 ES = " <RETURN> ":RS = " ! ":SS = " "
50 XS = " ":LM = (WL-29)/2+TX
70 FOR I = 768 TO 796:READ A:POKE I,A:NEXT I
80 DS = " ":FOR I = 1 TO 10:READ AS:DS = DS+AS:NEXT I
90 FOR I = 1 TO V:VS(I) = " ":FOR J = 1 TO 10:READ AS
100 VS(I) = VS(I)+AS:NEXT J,I:FOR I = 1 TO 18
110 READ KA(I):NEXT I:FOR I = 1 TO 43:KB(I) = 0:NEXT I
120 FOR I = 1 TO 4:READ AS(I):NEXT I:FOR I = 1 TO 17
130 KB(ASC(MID$(AS(4),I,1))-47) = KA(I+1):NEXT I
140 REM GOTO 490
150 FOR I = 1 TO 8:TS = " ":READ K:FOR J = 1 TO K:READ
AS
160 Q = ASC(LEFT$(AS,1))-64:FOR Z = 2 TO LEN(AS)

```

```

170 N = ASC(MID$(AS,Z,1))-Q
180 TS = TS+CHR$(N+TRU*26*(N < 65)):NEXT Z
190 TS = TS+" ":NEXT J:L$(I) = LEFT$(TS,LEN(TS)-1):NEX
T I
200 HOME
220 NS = "THE ALARM IS RINGING!":GOSUB 1000
230 NS = "CAN YOU STOP IT?":GOSUB 1000:GOSUB 3000:PRIN
T
240 Z$ = "PRESS"+ES+" TO SEE IF YOUR TUNE STOPS THE"
250 Z$ = Z$+" ALARM OR <H> FOR A HINT.":GOSUB 2000
260 POKE 6,20:POKE 8,220:CALL 768
270 K = PEEK(-16384)-128:IF K < 0 THEN 260
280 POKE -16368,0:ON ABS(K = 13) GOTO 320:K$ = CHR$(K)
290 ON ABS(K$ = "H") GOTO 310:GOTO 310:GOSUB 4000
300 X$ = MID$(X$,2,7)+K$:GOTO 260
310 HOME:PRINT:Z$ = L$(1):GOSUB 5000:GOTO 200
320 HOME:IF X$ = L$(8) THEN 340
330 Z$ = "NOPE! PLAY IT AGAIN, SAM.":GOSUB 5000:GOTO 2
00
340 HOME:Z$ = "THE ALARM STOPS, AND THE DOOR MAGICALLY
"
350 Z$ = Z$+" OPENS!":GOSUB 2000:PRINT:PRINT
360 FOR D = 1 TO DL:NEXT D:HOME:C = 2
380 FOR S = 1 TO 49
390 IF S <> 1 AND S <> 15 AND S <> 23 AND S <> 30 AND
S <> 37 AND S <> 44 THEN 410
400 Z$ = L$(C):GOSUB 2000:C = C+1:GOTO 420
410 FOR D = 1 TO DS:NEXT D
420 POKE 6,VAL(MID$(DS,S,1))*40
430 POKE 8,KA(ASC(MID$(VS(1),S,1))-64):CALL 768
440 NEXT S
490 HOME:GOSUB 3000
500 GOSUB 6000:IF K$ = CHR$(3) THEN END
510 GOSUB 4000:GOTO 500
1000 IF LEN(NS) = WL THEN PRINT NS;:RETURN
1010 PRINT TAB((WL-LEN(NS))/2+TX);NS;:RETURN
2000 IF LEN(Z$) <= WL THEN NS = Z$:GOSUB 1000:RETURN
2010 J = WL+1:K = 1:FOR I = J TO 2 STEP -1
2020 IF MID$(Z$,I,1) = " " THEN K = 0:J = I:I = 2
2030 NEXT I:NS = LEFT$(Z$,J-1):GOSUB 1000
2040 Z$ = RIGHT$(Z$,LEN(Z$)-J+K):GOTO 2000
3000 PRINT:FOR I = 1 TO 8:PRINT TAB(LM);:INVERSE
3010 IF I <> 6 THEN PRINT S$;S$:GOTO 3040
3020 FOR J = 1 TO 9:PRINT MID$(a$(2),J,1);S$;R$;
3030 NEXT J:PRINT "P";S$:GOTO 3080
3040 FOR J = 1 TO 9:KC = ASC(MID$(a$(3),J,1))
3050 IF I > 6 OR KC = 88 THEN PRINT R$;:GOTO 3070
3060 NORMAL:PRINT CHR$(32+(KC-32)*(I = 5));:INVERSE
3070 PRINT S$;S$:NEXT J:PRINT
3080 NORMAL:NEXT I:PRINT TAB(LM);:FOR J = 1 TO 10
3090 PRINT MID$(a$(1),J,1);S$;S$:NEXT J:PRINT:RETURN
4000 IF k$ < "0" OR k$ > "Y" THEN RETURN
4010 K = KB(ASC(k$)-47):IF K = 0 THEN RETURN
4020 POKE 6,20:POKE 8,K:CALL 768:RETURN
5000 GOSUB 2000:FOR I = 1 TO WH:PRINT:NEXT I
5010 Z$ = "PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GOSUB 6000:RETURN
6000 GET k$:RETURN
7000 DATA 165,8,74,133,10,164,8,173,48,192,136
7010 DATA 234,234,208,251,165,7,56,229,10,133
7020 DATA 7,176,237,198,6,208,233,96
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIGF,INPRR,RPNNP,PNMN
8080 DATA 128,121,114,108,102,96,91,85,81,76
8090 DATA 72,68,64,60,57,53,50,47
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LRXQF,NHVS,FLXKYNTKY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```



## Atari/A Musical Departure

```

10 DIM TEXT$(235),NTES(148),DURS(49),KBS(46),RS(100),B
UFS(8),GS(100),TEXT(10),PITCH(18),KB(43)
20 OPEN #1,4,0,"K":POKE 82,0:POKE 752,1:SETCOLOR 2,0,
0:BUFS=""
30 FOR I=1 TO 10:READ RS:DURS(LEN(DURS)+1)=RS:NEXT I
40 FOR I=1 TO 30:READ RS:NTES(LEN(NTES)+1)=RS:NEXT I
50 FOR I=1 TO 18:READ A:PITCH(I)=A:NEXT I:FOR I=1 TO 4
3:KB(I)=0:NEXT I
60 FOR I=1 TO 4:READ RS:KBS(LEN(KBS)+1)=RS:NEXT I
70 FOR I=30 TO 46:KB(ASC(KBS(I,I))-47)=PITCH(I-29):NEX
T I
80 REM GOTO 370
90 FOR I=1 TO 9:RS="" :READ K:FOR J=1 TO K:READ GS
100 Q=ASC(GS)-64:FOR Z=2 TO LEN(GS)
110 N=ASC(GS(Z))-Q
120 RS(LEN(RS)+1)=CHR$(N+26*(N<65)):NEXT Z:RS(LEN(RS)+
1)=" "
130 NEXT J:TEXT(I)=LEN(TEXTS)+1:TEXT$(TEXT(I))=RS(1,LE
N(RS)-1):NEXT I:TEXT(10)=LEN(TEXT$)
140 PRINT CHR$(125):POSITION 10,0:PRINT "THE ALARM IS
RINGING!"
150 POSITION 12,1:PRINT "CAN YOU STOP IT?":GOSUB 2000
160 PRINT "PRESS <RETURN> TO SEE IF YOUR TUNE STOPS";
170 PRINT " THE ALARM OR <H> FOR A HINT."
180 SOUND 1,25,12,5:SOUND 2,26,12,5
190 GET #1,K
200 ON K=155 GOTO 250:IF K=72 THEN 240
210 IF K<48 OR K>89 THEN 190
220 BUFS=BUFS(2,8):BUFS(8)=CHR$(K)
230 SOUND 0,KB(K-47),10,15:FOR D=1 TO 50:NEXT D:SOUND
0,0,0,0:GOTO 190
240 SOUND 1,0,0,0:SOUND 2,0,0,0:PRINT CHR$(125):POSITI
ON 4,0:PRINT TEXT$(TEXT(1),TEXT(2)-1):GOSUB 3000:GOTO
140
250 SOUND 1,0,0,0:SOUND 2,0,0,0:PRINT CHR$(125):IF BU
F$=TEXT$(TEXT(9),TEXT(10)) THEN 270
260 POSITION 6,0:PRINT "NOPE! PLAY IT AGAIN, SAM.":GOS
UB 3000:GOTO 140
270 PRINT CHR$(125):POSITION 8,0:PRINT "THE ALARM STOP
S, AND THE"
280 POSITION 10,1:PRINT "DOOR MAGICALLY OPENS!"
290 FOR D=1 TO 1000:NEXT D:PRINT CHR$(125):C=2
300 FOR S=1 TO 49
310 IF S<1 AND S<8 AND S<15 AND S<23 AND S<30 AND
S<37 AND S<44 THEN 330
320 RS=TEXT$(TEXT(C),TEXT(C+1)-1):GOSUB 1000:C=C+1
330 SOUND 0,PITCH(ASC(NTES(S,S))-64),10,15:SOUND 1,PIT
CH(ASC(NTES(S+49,S+49))-64),10,5
340 SOUND 2,PITCH(ASC(NTES(S+98,S+98))-64),10,5
350 FOR D=1 TO VAL(DURS(S,S))*100:NEXT D:SOUND 0,0,0,0
:SOUND 1,0,0,0:SOUND 2,0,0,0
360 NEXT S
370 PRINT CHR$(125):GOSUB 2000
380 GET #1,K
390 IF K>48 AND K<89 THEN SOUND 0,KB(K-47),10,15:FOR
D=1 TO 50:NEXT D:SOUND 0,0,0,0
400 GOTO 380
1000 POKE 85,(40-LEN(RS))/2:PRINT RS:RETURN
2000 PRINT :FOR I=1 TO 8:FOR J=0 TO 36 STEP 4
2010 PRINT CHR$(160):CHR$(160-(32-ASC(KBS(11+(J+1)/4,1
1+(J+1)/4)))*(I=7)):CHR$(160);
2020 IF J<8 AND J<24 AND J<36 AND I<6 THEN PRINT CH
R$(32-(32-ASC(KBS(21+(J+1)/4,21+(J+1)/4)))*(I=5)):GOT
O 2040
2030 IF J<36 THEN PRINT CHR$(252);
2040 NEXT J:PRINT :NEXT I
2050 PRINT " " :FOR I=1 TO 10:PRINT KB$(I,I);" " :NE
XT I:PRINT :RETURN
3000 POSITION 7,23:PRINT "PRESS ANY KEY TO CONTINUE.":
GET #1,K:RETURN
4000 DATA 11111,11111,11121,11111,11111
4010 DATA 11131,11111,11111,11222,2224
4020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNKI
4030 DATA KIFII,IIIGF,INPRR,RPNNP,PNNM
4040 DATA FFFDD,BFIMN,NMMIL,JGGGJ,KJKGF
4050 DATA GFBDD,FFDDB,FIMNN,MMILK,KIII

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```

4060 DATA BBBAA,BBFII,IIIFI,FBBBG,GGGBB
4070 DATA BBBBA,BBAAB,BFIII,IIFIG,GGGF
5000 DATA 128,121,114,108,102,96,91,85,81,76
5010 DATA 72,68,64,60,57,53,50,47
6000 DATA CDEFGABCDE,QWERTYUIOP
6010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
7000 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
7010 DATA 6,LYK,REGMLZ,HPIA,LRQXF,NHVS,FLXKYNTKYY
7020 DATA 5,MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
7030 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
7040 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
7050 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
7060 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
7070 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```

### Commodore 64/A Musical Departure

```

10 POKE 53281,12:POKE 53280,12:PRINT CHR$(5):V=3
20 DIM A$(4),L$(8),V$(V),KA(18,2),KB(43,2)
30 DL=1200:DS=30:TRU=-1:WH=20:WL=40:CL$=CHR$(147)
40 ES=" <RETURN> ":R$=CHR$(194):S$=" "
50 X$=" "
60 B=54272:FOR I=B TO B+24:POKE I,0:NEXT I
70 POKE B+24,15:POKE B+12,9:POKE B+9,255
80 DS="":FOR I=1 TO 10:READ A$:DS=DS+A$:NEXT I
90 FOR I=1 TO V:V$(I)="":FOR J=1 TO 10:READ A$
100 V$(I)=V$(I)+A$:NEXT J,I:FOR I=1 TO 18
110 FOR J=1 TO 2:READ KA(I,J):NEXT J,I:FOR I=1 TO 43:F
OR J=1 TO 2:KB(I,J)=0
120 NEXT J,I:FOR I=1 TO 4:READ A$(I):NEXT I:FOR I=1 TO
17:FOR J=1 TO 2
130 KB(ASC(MID$(A$(4),I,1))-47,J)=KA(I+1,J):NEXT J,I
140 REM GOTO 490
150 FOR I=1 TO 8:TS="":READ K:FOR J=1 TO K:READ A$
160 Q=ASC(LEFT$(A$,1))-64:FOR Z=2 TO LEN(A$)
170 N=ASC(MID$(A$,Z,1))-Q
180 TS=TS+CHR$(N+TRU*26*(N<65)):NEXT Z:TS=TS+" "
190 NEXT J:L$(I)=LEFT$(TS,LEN(TS)-1):NEXT I
200 PRINT CL$:
210 POKE B+5,128:POKE B+6,128:POKE B,85:POKE B+1,36
220 NS="THE ALARM IS RINGING!":GOSUB 1000
230 NS="CAN YOU STOP IT?":GOSUB 1000:GOSUB 3000:PRINT
240 Z$="PRESS"+ES+"TO SEE IF YOUR TUNE STOPS THE"
250 Z$=Z$+" ALARM OR <H> FOR A HINT.":GOSUB 2000
260 GET K$:POKE B+4,17:FOR D=1 TO 20:NEXT D:POKE B+4,3
3
270 ON -(K$="") GOTO 260:POKE B+4,0
280 IF K$=CHR$(13) THEN 320
290 ON ABS(K$="H") GOTO 310:GOSUB 4000
300 X$=MID$(X$,2,7)+K$:GOTO 260
310 PRINT CL$;:PRINT:Z$=L$(1):GOSUB 5000:GOTO 200
320 PRINT CL$;:IF X$=L$(8) THEN 340
330 Z$="NOPE! PLAY IT AGAIN, SAM.":GOSUB 5000:GOTO 200
340 PRINT CL$;:Z$="THE ALARM STOPS, AND THE DOOR MAGIC
ALLY"
350 Z$=Z$+" OPENS!":GOSUB 2000:PRINT:PRINT
360 FOR D=1 TO DL:NEXT D:PRINT CL$;:C=2
370 FOR I=0 TO 2:POKE B+5+7*I,68:POKE B+6+I*7,222:NEXT
I
380 FOR S=1 TO 49
390 IF S<>1 AND S<>15 AND S<>23 AND S<>30 AND S<>37 AN
D S<>44 THEN 410
400 Z$=L$(C):GOSUB 2000:C=C+1:GOTO 420
410 FOR D=1 TO DS:NEXT D
420 DUR=VAL(MID$(DS,S,1))*100:FOR I=1 TO 3:J=7*(I-1)
430 POKE B+4+J,0:F=ASC(MID$(V$(I),S,1))-64
440 POKE B+1+J,KA(F,1):POKE B+J,KA(F,2):NEXT I
450 FOR I=B+4 TO B+18 STEP 7:POKE I,33:POKE I-1,32
460 NEXT I:FOR D=1 TO DUR:NEXT D:NEXT S
470 FOR I=B TO B+24:POKE I,0:NEXT I
480 POKE B+12,9:POKE B+9,255:POKE B+24,15
490 PRINT CL$;:GOSUB 3000
500 GOSUB 6000:IF K$=CHR$(3) THEN END
510 GOSUB 4000:GOTO 500
1000 IF LEN(NS)=WL THEN PRINT NS;:RETURN
1010 PRINT SPC((WL-LEN(NS))/2);NS;:RETURN

```

```

2000 IF LEN(Z$)<=WL THEN NS=Z$:GOSUB 1000:RETURN
2010 J=WL+1:K=1:FOR I=J TO 2 STEP -1
2020 IF MID$(Z$,I,1)=" " THEN K=0:J=I:2
2030 NEXT I:NS=LEFT$(Z$,J-1):GOSUB 1000
2040 Z$=RIGHT$(Z$,LEN(Z$)-J+K):GOTO 2000
3000 PRINT:FOR I=1 TO 8:PRINT TAB(LM);CHR$(18);
3010 IF I<>6 THEN PRINT SS;S$:GOTO 3040
3020 FOR J=1 TO 9:PRINT MID$(A$(2),J,1);SS;R$;
3030 NEXT J:PRINT "P";S$:GOTO 3080
3040 FOR J=1 TO 9:KC=ASC(MID$(A$(3),J,1))
3050 IF I>6 OR KC=88 THEN PRINT R$;GOTO 3070
3060 PRINT CHR$(144);CHR$(32-(KC-32)*(I=5));CHR$(5);
3070 PRINT SS;S$;:NEXT J:PRINT
3080 NEXT I:PRINT TAB(LM);:FOR J=1 TO 10
3090 PRINT MID$(A$(1),J,1);" ";:NEXT J:PRINT:RETURN
4000 IF K$<"0" OR K$>"Y" THEN RETURN
4010 K=KB(ASC(K$)-47,1):IF K=0 THEN RETURN
4020 POKE B+8,K:POKE B+7,KB(ASC(K$)-47,2):POKE B+11,65
4030 FOR D=1 TO 50:NEXT D:POKE B+11,64:RETURN
5000 GOSUB 2000:FOR I=1 TO WH:PRINT:NEXT I
5010 Z$="PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GOSUB 6000:RETURN
6000 GET K$:ON -(K$="") GOTO 6000:RETURN
8000 DATA 11111,11111,11111,11111,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIGF,INPRR,RPNPN,PNMN
8040 DATA FFFDD,BFIMN,NMMIL,JGGGJ,KJKGF
8050 DATA GFBDD,FFDDB,FIMNN,MMLK,KIII
8060 DATA BBBAA,BBFII,IIIFI,FBBBG,GGGBB
8070 DATA BBBBA,BBAAB,BFIII,IIFIG,GGGF
8080 DATA 15,210,16,195,17,195,18,209,19,239,21,32
8090 DATA 22,96,23,181,25,30,26,156,28,49,29,223
8100 DATA 31,165,33,135,35,134,37,162,39,223,42,62
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LRQXF,NHVS,FLXKYNTKYY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```

### IBM PC/A Musical Departure

```

10 SCREEN 0,1:COLOR 7,0:KEY OFF:LOCATE ,0:V=1
20 DIM A$(4),L$(8),V$(V),KA(18),KB(43)
30 DL=1200:DS=50:TRU=-1:WH=20:WL=80:WIDTH WL
40 ES=" <ENTER> ":R$=CHR$(221):R1$=CHR$(222):S$=CHR$(2
19)
50 X$=" "
60 LM=(WL-29)/2+TX
80 DS="":FOR I=1 TO 10:READ A$:DS=DS+A$:NEXT I
90 FOR I=1 TO V:V$(I)="":FOR J=1 TO 10:READ A$
100 V$(I)=V$(I)+A$:NEXT J,I:FOR I=1 TO 18
110 READ KA(I):NEXT I:FOR I=1 TO 43:KB(I)=0:NEXT I
120 FOR I=1 TO 4:READ A$(I):NEXT I:FOR I=1 TO 17
130 KB(ASC(MID$(A$(4),I,1))-47)=KA(I+1):NEXT I
140 REM GOTO 490
150 FOR I=1 TO 8:TS="":READ K:FOR J=1 TO K:READ A$
160 Q=ASC(LEFT$(A$,1))-64:FOR Z=2 TO LEN(A$)
170 N=ASC(MID$(A$,Z,1))-Q
180 TS=TS+CHR$(N+TRU*26*(N<65)):NEXT Z:TS=TS+" "
190 NEXT J:L$(I)=LEFT$(TS,LEN(TS)-1):NEXT I
200 CLS
220 NS="THE ALARM IS RINGING!":GOSUB 1000
230 NS="CAN YOU STOP IT?":GOSUB 1000:GOSUB 3000:PRINT
240 Z$="PRESS"+ES+"TO SEE IF YOUR TUNE STOPS THE"
250 Z$=Z$+" ALARM OR <H> FOR A HINT.":GOSUB 2000
260 SOUND 120,3:FOR D=1 TO 90:NEXT D
270 K$=INKEY$:IF K$=" " THEN 260
280 IF K$=CHR$(13) THEN 320
290 ON ABS(K$="H") GOTO 310:GOSUB 4000
300 X$=MID$(X$,2,7)+K$:GOTO 260
310 CLS:PRINT:Z$=L$(1):GOSUB 5000:GOTO 200

```



```

320 CLS:IF X$=L$(8) THEN 340
330 Z$="NOPE! PLAY IT AGAIN, SAM.":GOSUB 5000:GOTO 200
340 CLS:Z$="THE ALARM STOPS, AND THE DOOR MAGICALLY"
350 Z$=Z$+" OPENS!":GOSUB 2000:PRINT:PRINT
360 FOR D=1 TO DL:NEXT D:CLS:C=2
380 FOR S=1 TO 49
390 IF S<>1 AND S<>15 AND S<>23 AND S<>30 AND S<>37 AND
D S<>44 THEN 410
400 Z$=L$(C):GOSUB 2000:C=C+1:GOTO 420
410 FOR D=1 TO DS:NEXT D
420 SOUND KA(ASC(MID$(V$(1),S,1))-64),VAL(MID$(D$,S,1)
)*6-.5:SOUND 32767,.5
440 NEXT S
490 CLS:GOSUB 3000
500 GOSUB 6000:IF K$=CHR$(3) THEN END
510 GOSUB 4000:GOTO 500
1000 IF LEN(N$)=WL THEN PRINT N$;:RETURN
1010 PRINT TAB((WL-LEN(N$))/2+TX);N$;:RETURN
2000 IF LEN(Z$)<=WL THEN N$=Z$:GOSUB 1000:RETURN
2010 J=WL+1:K=1:FOR I=J TO 2 STEP -1
2020 IF MID$(Z$,I,1)=" " THEN K=0:J=I:GOTO 2030
2030 NEXT I:N$=LEFT$(Z$,J-1):GOSUB 1000
2040 Z$=RIGHT$(Z$,LEN(Z$)-J+K):GOTO 2000
3000 PRINT:FOR I=1 TO 8:PRINT TAB(LM);
3010 IF I<>6 THEN PRINT S$;S$:GOTO 3040
3020 FOR J=1 TO 9:COLOR 4,7:PRINT MID$(A$(2),J,1);:COL
OR 7,0:PRINT S$;RS;
3030 NEXT J:COLOR 4,7:PRINT "P";:COLOR 7,0:PRINT S$:GO
TO 3080
3040 FOR J=1 TO 9:KC=ASC(MID$(A$(3),J,1))
3050 IF I>6 OR KC=88 THEN PRINT RS;S$:GOTO 3070
3060 IF I=5 THEN COLOR 4:PRINT CHR$(KC);:COLOR 7,0:PRI
NT R1$; ELSE PRINT " ";R1$;
3070 PRINT S$;:NEXT J:PRINT
3080 NEXT I:PRINT TAB(LM);:FOR J=1 TO 10
3090 PRINT MID$(A$(1),J,1);" ";:NEXT J:PRINT:RETURN
4000 IF K$<"0" OR K$>"Y" THEN RETURN
4010 K=KB(ASC(K$)-47):IF K=0 THEN RETURN
4020 SOUND K,2.5:FOR D=1 TO 50:NEXT D:RETURN
5000 GOSUB 2000:FOR I=1 TO WH:PRINT:NEXT I
5010 Z$="PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GOSUB 6000:RETURN
6000 K$=INKEY$:IF K$="" THEN 6000 ELSE RETURN
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA 1111G,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIGF,INPRR,RPNPN,PNMN
8080 DATA 247,262,277,294,311,330,349,370,392
8090 DATA 415,440,466,494,523,554,587,622,659
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LQXF,NHVS,FLXKYNTKYY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```

### IBM PCjr/A Musical Departure

```

10 SCREEN 0,1:COLOR 7,0:KEY OFF:LOCATE ,0:V=1
20 DIM A$(4),L$(8),V$(V),KA(18),KB(43)
30 DL=1200:DS=50:TRU=1:WH=20:WL=40:WIDTH WL
40 ES=" <ENTER> ":RS=CHR$(221):R1$=CHR$(222):S$=CHR$(2
19)
50 X$=" " :LM=(WL-29)/2+TX
60 SOUND OFF:BEEP OFF
80 D$="":FOR I=1 TO 10:READ A$:D$=D$+A$:NEXT I
90 FOR I=1 TO V:V$(I)="":FOR J=1 TO 10:READ A$
100 V$(I)=V$(I)+A$:NEXT J,I:FOR I=1 TO 18
110 READ KA(I):NEXT I:FOR I=1 TO 43:KB(I)=0:NEXT I
120 FOR I=1 TO 4:READ A$(I):NEXT I:FOR I=1 TO 17
130 KB(ASC(MID$(A$(4),I,1))-47)=KA(I+1):NEXT I
140 REM GOTO 490

```

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# PUZZLE

```

150 FOR I=1 TO 8:TS="":READ K:FOR J=1 TO K:READ AS
160 Q=ASC(LEFT$(AS,1))-64:FOR Z=2 TO LEN(AS)
170 N=ASC(MID$(AS,Z,1))-Q
180 TS=TS+CHR$(N+TRU*26*(N<65)):NEXT Z:TS=TS+" "
190 NEXT J:LS(I)=LEFT$(TS,LEN(TS)-1):NEXT I
200 CLS
220 NS="THE ALARM IS RINGING!":GOSUB 1000
230 NS="CAN YOU STOP IT?":GOSUB 1000:GOSUB 3000:PRINT
240 Z$="PRESS"+ES+"TO SEE IF YOUR TUNE STOPS THE"
250 Z$=Z$+" ALARM OR <H> FOR A HINT.":GOSUB 2000
260 SOUND 120,3:FOR D=1 TO 90:NEXT D
270 K$=INKEY$:IF K$="" THEN 260
280 IF K$=CHR$(13) THEN 320
290 ON ABS(K$="H") GOTO 310:GOSUB 4000
300 X$=MID$(X$,2,7)+K$:GOTO 260
310 CLS:PRINT:Z$=LS(1):GOSUB 5000:GOTO 200
320 CLS:IF X$=LS(8) THEN 340
330 Z$="NOPE! PLAY IT AGAIN, SAM.":GOSUB 5000:GOTO 200
340 CLS:Z$="THE ALARM STOPS, AND THE DOOR MAGICALLY"
350 Z$=Z$+" OPENS!":GOSUB 2000:PRINT:PRINT
360 FOR D=1 TO DL:NEXT D:CLS:C=2
380 FOR S=1 TO 49
390 IF S<>1 AND S<>15 AND S<>23 AND S<>30 AND S<>37 AN
D S<>44 THEN 410
400 Z$=LS(C):GOSUB 2000:C=C+1:GOTO 420
410 FOR D=1 TO DS:NEXT D
420 SOUND KA(ASC(MID$(VS(1),S,1))-64),VAL(MID$(DS,S,1)
)*6-.5:SOUND 32767,.5
440 NEXT S
490 CLS:GOSUB 3000
500 GOSUB 6000:IF K$=CHR$(3) THEN END
510 GOSUB 4000:GOTO 500
1000 IF LEN(NS)=WL THEN PRINT NS:RETURN
1010 PRINT TAB((WL-LEN(NS))/2+TX);NS:RETURN
2000 IF LEN(Z$)<=WL THEN NS=Z$:GOSUB 1000:RETURN
2010 J=WL+1:K=1:FOR I=J TO 2 STEP -1
2020 IF MID$(Z$,I,1)=" " THEN K=0:J=I:I=2
2030 NEXT I:NS=LEFT$(Z$,J-1):GOSUB 1000
2040 Z$=RIGHT$(Z$,LEN(Z$)-J+K):GOTO 2000
3000 PRINT:FOR I=1 TO 8:PRINT TAB(LM);
3010 IF I<>6 THEN PRINT SS;SS:GOTO 3040
3020 FOR J=1 TO 9:COLOR 4,7:PRINT MID$(AS(2),J,1):COL
OR 7,0:PRINT SS;RS;
3030 NEXT J:COLOR 4,7:PRINT "P";:COLOR 7,0:PRINT SS:GO
TO 3080
3040 FOR J=1 TO 9:KC=ASC(MID$(AS(3),J,1))
3050 IF I>6 OR KC=88 THEN PRINT RS;SS:GOTO 3070
3060 IF I=5 THEN COLOR 4:PRINT CHR$(KC):COLOR 7,0:PRI
NT R1$; ELSE PRINT " ";R1$;
3070 PRINT SS;:NEXT J:PRINT
3080 NEXT I:PRINT TAB(LM):FOR J=1 TO 10
3090 PRINT MID$(AS(1),J,1);" ";:NEXT J:PRINT:RETURN
4000 IF K$<"0" OR K$>"Y" THEN RETURN
4010 K=KB(ASC(K$)-47):IF K=0 THEN RETURN
4020 SOUND K,2.5:FOR D=1 TO 50:NEXT D:RETURN
5000 GOSUB 2000:FOR I=1 TO WH:PRINT:NEXT I
5010 Z$="PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GOSUB 6000:RETURN
6000 K$=INKEY$:IF K$="" THEN 6000 ELSE RETURN
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIGF,INPRR,RPNNP,PNMN
8080 DATA 247,262,277,294,311,330,349,370,392
8090 DATA 415,440,466,494,523,554,587,622,659
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LRQXF,NHVS,FLXKYNTKY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXQDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```

## IBM PCjr w/Cartridge BASIC & TV/Monitor Speak-er/A Musical Departure

```

10 SCREEN 0,1:COLOR 7,0:KEY OFF:LOCATE ,,0:V=3
20 DIM AS(4),LS(8),VS(V),KA(18),KB(43),FRQ(3)
30 DL=1200:TRU=-1:WH=20:WL=40:WIDTH WL
40 ES=" <ENTER> ":RS=CHR$(221):R1$=CHR$(222):SS=CHR$(2
19)
50 X$=" " "LM=(WL-29)/2+TX:SOUND ON
80 DS="":FOR I=1 TO 10:READ AS:DS=DS+AS:NEXT I
90 FOR I=1 TO V:VS(I)="":FOR J=1 TO 10:READ AS
100 VS(I)=VS(I)+AS:NEXT J,I:FOR I=1 TO 18
110 READ KA(I):NEXT I:FOR I=1 TO 43:KB(I)=0:NEXT I
120 FOR I=1 TO 4:READ AS(I):NEXT I:FOR I=1 TO 17
130 KB(ASC(MID$(AS(4),I,1))-47)=KA(I+1):NEXT I
140 REM GOTO 490
150 FOR I=1 TO 8:TS="":READ K:FOR J=1 TO K:READ AS
160 Q=ASC(LEFT$(AS,1))-64:FOR Z=2 TO LEN(AS)
170 N=ASC(MID$(AS,Z,1))-Q
180 TS=TS+CHR$(N+TRU*26*(N<65)):NEXT Z:TS=TS+" "
190 NEXT J:LS(I)=LEFT$(TS,LEN(TS)-1):NEXT I
200 CLS
220 NS="THE ALARM IS RINGING!":GOSUB 1000
230 NS="CAN YOU STOP IT?":GOSUB 1000:GOSUB 3000:PRINT
240 Z$="PRESS"+ES+"TO SEE IF YOUR TUNE STOPS THE"
250 Z$=Z$+" ALARM OR <H> FOR A HINT.":GOSUB 2000
260 SOUND 120,3:FOR D=1 TO 90:NEXT D
270 K$=INKEY$:IF K$="" THEN 260
280 IF K$=CHR$(13) THEN 320
290 ON ABS(K$="H") GOTO 310:GOSUB 4000
300 X$=MID$(X$,2,7)+K$:GOTO 260
310 CLS:PRINT:Z$=LS(1):GOSUB 5000:GOTO 200
320 CLS:IF X$=LS(8) THEN 340
330 Z$="NOPE! PLAY IT AGAIN, SAM.":GOSUB 5000:GOTO 200
340 CLS:Z$="THE ALARM STOPS, AND THE DOOR MAGICALLY"
350 Z$=Z$+" OPENS!":GOSUB 2000
360 FOR D=1 TO DL:NEXT D:CLS:C=2
370 FOR S=1 TO 49:DUR=VAL(MID$(DS,S,1))*5
380 FOR I=1 TO 3:FRQ(I)=ASC(MID$(VS(I),S,1))-64:NEXT I
390 IF S<>1 AND S<>15 AND S<>23 AND S<>30 AND S<>37 AN
D S<>44 THEN 420
400 IF PLAY(0)>1 THEN 400
410 Z$=LS(C):GOSUB 2000:C=C+1
420 FOR I=1 TO 3:SOUND KA(FRQ(I)),DUR,16-I,I-1
430 SOUND 32767,1,,I-1:NEXT I
440 NEXT S
450 PLAY "MF"
490 CLS:GOSUB 3000
500 GOSUB 6000:IF K$=CHR$(3) THEN END
510 GOSUB 4000:GOTO 500
1000 IF LEN(NS)=WL THEN PRINT NS:RETURN
1010 PRINT TAB((WL-LEN(NS))/2+TX);NS:RETURN
2000 IF LEN(Z$)<=WL THEN NS=Z$:GOSUB 1000:RETURN
2010 J=WL+1:K=1:FOR I=J TO 2 STEP -1
2020 IF MID$(Z$,I,1)=" " THEN K=0:J=I:I=2
2030 NEXT I:NS=LEFT$(Z$,J-1):GOSUB 1000
2040 Z$=RIGHT$(Z$,LEN(Z$)-J+K):GOTO 2000
3000 PRINT:FOR I=1 TO 8:PRINT TAB(LM);
3010 IF I<>6 THEN PRINT SS;SS:GOTO 3040
3020 FOR J=1 TO 9:COLOR 4,7:PRINT MID$(AS(2),J,1):COL
OR 7,0:PRINT SS;RS;
3030 NEXT J:COLOR 4,7:PRINT "P";:COLOR 7,0:PRINT SS:GO
TO 3080
3040 FOR J=1 TO 9:KC=ASC(MID$(AS(3),J,1))
3050 IF I>6 OR KC=88 THEN PRINT RS;SS:GOTO 3070
3060 IF I=5 THEN COLOR 4:PRINT CHR$(KC):COLOR 7,0:PR
INT R1$; ELSE PRINT " ";R1$;
3070 PRINT SS;:NEXT J:PRINT
3080 NEXT I:PRINT TAB(LM):FOR J=1 TO 10
3090 PRINT MID$(AS(1),J,1);" ";:NEXT J:PRINT:RETURN
4000 IF K$<"0" OR K$>"Y" THEN RETURN
4010 K=KB(ASC(K$)-47):IF K=0 THEN RETURN
4020 SOUND K,2.5:FOR D=1 TO 50:NEXT D:RETURN
5000 GOSUB 2000:FOR I=1 TO WH:PRINT:NEXT I
5010 Z$="PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GOSUB 6000:RETURN

```



```

6000 KS=INKEY$:IF KS="" THEN 6000 ELSE RETURN
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNI
8030 DATA KIFII,IIIGF,INPRR,RPNNP,PNMN
8040 DATA FFFDD,BFIMN,NMMIL,JGGGJ,KJKGF
8050 DATA GFBDD,FFDDF,FIMNN,MMILK,KIII
8060 DATA BBBAA,BFII,IIIFI,FBBBG,GGGBB
8070 DATA BBBBA,BBAAB,BFIII,IIFIG,GGGF
8080 DATA 247,262,277,294,311,330,349,370,392
8090 DATA 415,440,466,494,523,554,587,622,659
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LRQXF,NHVS,FLXKYNTKYY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```

### TI-99/4A/A Musical Departure

```

10 CALL SCREEN(15)
20 DIM A$(4),L$(8),V$(3),F(3),KA(18),KB(43),KC(9)
30 CALL CHAR(128,"FFFFFFFFFFFFFFFF")
40 CALL CHAR(129,"1818181818181818")
50 CALL CHAR(130,"0000000000000000")
60 CALL CHAR(136,"F8F8F8F8F8F8F8F8")
70 CALL CHAR(137,"1F1F1F1F1F1F1F1F")
80 CALL COLOR(13,2,16)
90 CALL COLOR(14,16,2)
100 X$=""
110 D$=""
120 FOR I=1 TO 10
130 READ B$

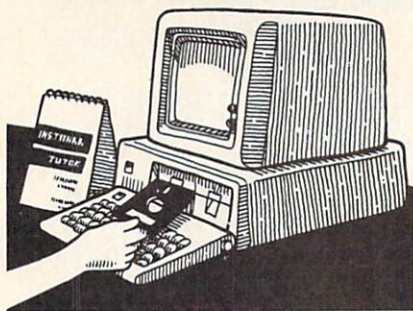
```

```

140 D$=D$&B$
150 NEXT I
160 FOR I=1 TO 3
170 V$(I)=""
180 FOR J=1 TO 10
190 READ B$
200 V$(I)=V$(I)&B$
210 NEXT J
220 NEXT I
230 FOR I=1 TO 18
240 READ KA(I)
250 NEXT I
260 FOR I=1 TO 43
270 KB(I)=0
280 NEXT I
290 FOR I=1 TO 4
300 READ AS(I)
310 NEXT I
320 FOR I=1 TO 9
330 KC(I)=ASC(SEG$(AS(3),I,1))
340 NEXT I
350 FOR I=1 TO 17
360 KB(ASC(SEG$(AS(4),I,1))-47)=KA(I+1)
370 NEXT I
380 REM GOTO 1040
390 FOR I=1 TO 8
400 T$=""
410 READ K
420 FOR J=1 TO K
430 READ B$
440 Q=ASC(SEG$(B$,1,1))-64
450 FOR Z=2 TO LEN(B$)
460 N=ASC(SEG$(B$,Z,1))-Q
470 T$=T$&CHR$(N-26*(N<65))
480 NEXT Z
490 T$=T$&" "
500 NEXT J
510 L$(I)=SEG$(T$,1,LEN(T$)-1)

```

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| Make _____                                                                                   | Model _____ |



```

520 NEXT I
530 CALL CLEAR
540 PRINT TAB(4);"THE ALARM IS RINGING!"
550 PRINT TAB(7);"CAN YOU STOP IT?"
560 GOSUB 2000
570 PRINT
580 Z$="PRESS <ENTER> TO SEE IF YOUR TUNE"
590 Z$=Z$&" STOPS THE ALARM OR <H> FOR A HINT."
600 GOSUB 3000
610 CALL SOUND(200,-2,8)
620 CALL KEY(3,K,S)
630 IF S=0 THEN 610
640 IF K=13 THEN 740
650 IF K=72 THEN 690
660 GOSUB 4000
670 X$=SEG$(X$,2,7)&CHR$(K)
680 GOTO 610
690 CALL CLEAR
700 Z$=L$(1)
710 GOSUB 3000
720 GOSUB 5000
730 GOTO 530
740 CALL CLEAR
750 IF X$=L$(8) THEN 790
760 PRINT " NOPE! PLAY IT AGAIN, SAM."
770 GOSUB 5000
780 GOTO 530
790 CALL CLEAR
800 Z$="THE ALARM STOPS, AND THE DOOR"
810 Z$=Z$&" MAGICALLY OPENS!"
820 GOSUB 3000
830 PRINT
840 FOR D=1 TO 800
850 NEXT D
860 CALL CLEAR
870 C=2
880 FOR Q=1 TO 2
890 FOR S=1 TO 49
900 IF Q=2 THEN 950
910 IF (S<>1)*(S<>15)*(S<>23)*(S<>30)*(S<>37)*(S<>44) THEN 950
920 Z$=L$(C)
930 GOSUB 3000
940 C=C+1
950 DUR=VAL(SEG$(D$,S,1))*350
960 FOR I=1 TO 3
970 F(I)=KA(ASC(SEG$(V$(I),S,1))-64)
980 NEXT I
990 CALL SOUND(DUR,F(1),0,F(2),1,F(3),2)
1000 NEXT S
1010 FOR D=1 TO 300
1020 NEXT D
1030 NEXT Q
1040 CALL CLEAR
1050 GOSUB 2000
1060 GOSUB 6000
1070 GOSUB 4000
1080 GOTO 1060
2000 PRINT
2010 FOR I=1 TO 9
2020 PRINT TAB(4);CHR$(137);
2030 IF I<>6 THEN 2090
2040 FOR J=1 TO 9
2050 PRINT SEG$(A$(2),J,1);CHR$(129);
2060 NEXT J
2070 PRINT "P";CHR$(136)
2080 GOTO 2210
2090 PRINT CHR$(130);
2100 FOR J=1 TO 9
2110 IF KC(J)=88 THEN 2180
2120 IF I<>4 THEN 2150
2130 PRINT CHR$(KC(J));CHR$(130);
2140 GOTO 2190
2150 IF I>5 THEN 2180
2160 PRINT CHR$(128);CHR$(130);
2170 GOTO 2190

```

```

2180 PRINT CHR$(129);CHR$(130);
2190 NEXT J
2200 PRINT CHR$(136)
2210 NEXT I
2220 PRINT TAB(5);
2230 FOR J=1 TO 10
2240 PRINT SEG$(A$(1),J,1);" ";
2250 NEXT J
2260 PRINT
2270 RETURN
3000 IF LEN(Z$)>28 THEN 3040
3010 N$=Z$
3020 GOSUB 7000
3030 RETURN
3040 J=29
3050 K=1
3060 FOR I=29 TO 2 STEP -1
3070 IF SEG$(Z$,I,1)<>" " THEN 3110
3080 K=0
3090 J=I
3100 I=1
3110 NEXT I
3120 N$=SEG$(Z$,1,J-1)
3130 GOSUB 7000
3140 Z$=SEG$(Z$,J-K+1,LEN(Z$)-J+K)
3150 GOTO 3000
4000 IF (K<48)+(K>89) THEN 4040
4010 M=KB(K-47)
4020 IF M=0 THEN 4040
4030 CALL SOUND(250,M,0)
4040 RETURN
5000 FOR I=1 TO 15
5010 PRINT
5020 NEXT I
5030 PRINT TAB(2);"PRESS ANY KEY TO CONTINUE."
5040 GOSUB 6000
5050 RETURN
6000 CALL KEY(3,K,S)
6010 IF S<1 THEN 6000
6020 RETURN
7000 PRINT TAB((28-LEN(N$))/2);N$;
7010 IF LEN(N$)=28 THEN 7030
7020 PRINT
7030 RETURN
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIGF,INPRR,RPNNP,PNMN
8040 DATA FFFDD,BFIMN,NMILK,JGGGJ,KJKGF
8050 DATA GFBDD,FFDDB,FIMNN,MMILK,KIII
8060 DATA BBBAA,BBFII,IIIFI,FBGGG,GGGGB
8070 DATA BBBBA,BBAAB,BFIII,IIIFI,GGGF
8080 DATA 247,262,277,294,311,330,349,370,392
8090 DATA 415,440,466,494,523,554,587,622,659
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LRQXF,NHVS,FLXKYNTKYY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVSDXJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNHJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKQFURP%,1,EYWJYNTUN

```

### TRS-80 Color Computer/A Musical Departure

```

10 CLEAR 1000:V=1
20 DIM A$(4),L$(8),V$(V),KA(18),KB(43)
30 DL=1200:DS=30:TX=0:TRU=-1:WH=12:WL=32
40 ES=" <ENTER> ":S$=CHR$(143+64):R$=CHR$(138+64)
50 X$=" "
 "LM=(WL-29)/2+TX
80 D$="":FOR I=1 TO 10:READ A$:D$=D$+A$:NEXT I
90 FOR I=1 TO V:V$(I)="":FOR J=1 TO 10:READ A$
100 V$(I)=V$(I)+A$:NEXT J,I:FOR I=1 TO 18
110 READ KA(I):NEXT I:FOR I=1 TO 43:KB(I)=0:NEXT I

```



```

120 FOR I=1 TO 4:READ A$(I):NEXT I:FOR I=1 TO 17
130 KB(ASC(MID$(A$(4),I,1))-47)=KA(I+1):NEXT I
140 REM GOTO 490
150 FOR I=1 TO 8:TS="":READ K:FOR J=1 TO K:READ AS
160 Q=ASC(LEFT$(A$,1))-64:FOR Z=2 TO LEN(A$)
170 N=ASC(MID$(A$,Z,1))-Q
180 TS=TS+CHR$(N+TRU*26*(N<65)):NEXT Z:TS=TS+" "
190 NEXT J:L$(I)=LEFT$(TS,LEN(TS)-1):NEXT I
200 CLS
220 NS="THE ALARM IS RINGING!":GOSUB 1000
230 NS="CAN YOU STOP IT?":GOSUB 1000:GOSUB 3000:PRINT
240 Z$="PRESS"+E$+"TO SEE IF YOUR TUNE STOPS THE"
250 Z$=Z$+"ALARM OR <H> FOR A HINT.":GOSUB 2000
260 SOUND 60,2:FOR D=1 TO 50:NEXT D
270 K$=INKEY$:IF K$="" THEN 260
280 IF K$=CHR$(13) THEN 320
290 ON ABS(K$="H") GOTO 310:GOSUB 4000
300 X$=MID$(X$,2,7)+K$:GOTO 260
310 CLS:PRINT:Z$=L$(1):GOSUB 5000:GOTO 200
320 CLS:IF X$=L$(8) THEN 340
330 Z$="NOPE! PLAY IT AGAIN, SAM.":GOSUB 5000:GOTO 200
340 CLS:Z$="THE ALARM STOPS, AND THE DOOR MAGICALLY"
350 Z$=Z$+"OPENS!":GOSUB 2000:PRINT:PRINT
360 FOR D=1 TO DL:NEXT D:CLS:C=2
380 FOR S=1 TO 49
390 IF S<>1 AND S<>15 AND S<>23 AND S<>30 AND S<>37 AN
D S<>44 THEN 410
400 Z$=L$(C):GOSUB 2000:C=C+1:GOTO 420
410 FOR D=1 TO DS:NEXT D
420 SOUND KA(ASC(MID$(V$(1),S,1))-64),VAL(MID$(D$,S,1)
)*3
440 NEXT S
490 CLS:GOSUB 3000
500 GOSUB 6000
510 GOSUB 4000:GOTO 500

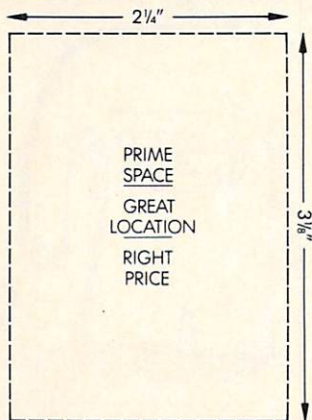
```

```

1000 IF LEN(NS)=WL THEN PRINT NS$:RETURN
1010 PRINT TAB((WL-LEN(NS))/2+TX);NS$:RETURN
2000 IF LEN(Z$)<=WL THEN NS=Z$:GOSUB 1000:RETURN
2010 J=WL+1:K=1:FOR I=J TO 2 STEP -1
2020 IF MID$(Z$,I,1)=" " THEN K=0:J=I:I=2
2030 NEXT I:NS=LEFT$(Z$,J-1):GOSUB 1000
2040 Z$=RIGHT$(Z$,LEN(Z$)-J+K):GOTO 2000
3000 PRINT:FOR I=1 TO 7:PRINT CHR$(138);
3010 IF I<>5 THEN PRINT SS$:GOTO 3040
3020 FOR J=1 TO 9:PRINT MID$(A$(2),J,1);SS$:RS;
3030 NEXT J:PRINT "P";SS$:GOTO 3080
3040 FOR J=1 TO 9:KC=ASC(MID$(A$(3),J,1))
3050 IF I>5 OR KC=88 THEN PRINT R$:SS$:GOTO 3070
3060 PRINT CHR$(KC-(128-KC)*(I<>3));CHR$(133+64);
3070 PRINT SS$:NEXT J
3080 PRINT CHR$(133);" ";:NEXT I:PRINT TAB(LM);:FOR J=
1 TO 10
3090 PRINT MID$(A$(1),J,1);" ";:NEXT J:PRINT:RETURN
4000 IF K$<"0" OR K$>"Y" THEN RETURN
4010 K=KB(ASC(K$)-47):IF K=0 THEN RETURN
4020 SOUND K,2:RETURN
5000 GOSUB 2000:FOR I=1 TO WH:PRINT:NEXT I
5010 Z$="PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GOSUB 6000:RETURN
6000 K$=INKEY$:ON ABS(K$="") GOTO 6000:RETURN
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA IIIIG,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIGF,INPRR,RPNPN,PNMN
8080 DATA 78,89,99,108,117,125,133,140,147,153
8090 DATA 159,165,170,176,180,185,189,193
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LRQXF,NHVS,FLXYNTKYY

```

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## PUZZLE

```

9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```

### VIC-20 w/8K or 16K RAM Cartridge/A Musical Departure

```

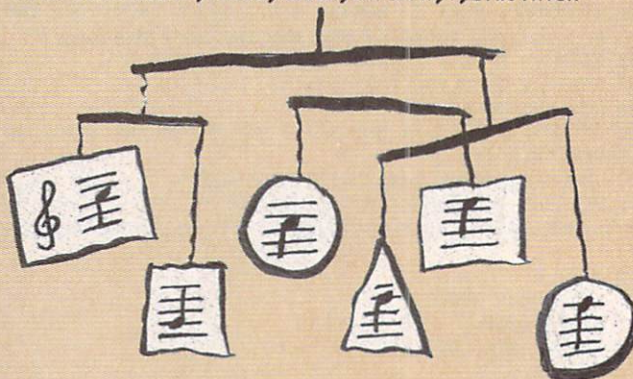
10 POKE 36879,235:PRINT CHR$(5):V=1
20 DIM A$(4),L$(8),V$(V),KA(18),KB(43)
30 DL=1200:DS=20:TRU=-1:WH=17:WL=22:CL$=CHR$(147)
40 E$=" <RETURN> ":R$=CHR$(194):S$=" "
50 X$=" " :LM=(WL-19)/2
60 B=36874:POKE B+4,15
70 FOR I=B TO B+3:POKE I,0:NEXT I
80 D$="":FOR I=1 TO 10:READ A$:D$=D$+A$:NEXT I
90 FOR I=1 TO V:V$(I)="" :FOR J=1 TO 10:READ A$
100 V$(I)=V$(I)+A$:NEXT J,I:FOR I=1 TO 18
110 READ KA(I):NEXT I:FOR I=1 TO 43:KB(I)=0:NEXT I
120 FOR I=1 TO 4:READ A$(I):NEXT I:FOR I=1 TO 17
130 KB(ASC(MID$(A$(4),I,1))-47)=KA(I+1):NEXT I
140 REM GOTO 490
150 FOR I=1 TO 8:T$="":READ K:FOR J=1 TO K:READ A$
160 Q=ASC(LEFT$(A$,1))-64:FOR Z=2 TO LEN(A$)
170 N=ASC(MID$(A$,Z,1))-Q
180 T$=T$+CHR$(N+TRU*26*(N<65)):NEXT Z:T$=T$+" "
190 NEXT J:L$(I)=LEFT$(T$,LEN(T$)-1):NEXT I
200 PRINT CL$:
220 N$="THE ALARM IS RINGING!":GOSUB 1000
230 N$="CAN YOU STOP IT?":GOSUB 1000:GOSUB 3000:PRINT
240 Z$="PRESS"+E$+"TO SEE IF YOUR TUNE STOPS THE"
250 Z$=Z$+" ALARM OR <H> FOR A HINT.":GOSUB 2000
260 GET K$:POKE B,180:FOR D=1 TO 30:NEXT D:POKE B,220
270 ON -(K$="") GOTO 260:POKE B,0
280 IF K$=CHR$(13) THEN 320
290 ON ABS(K$="H") GOTO 310:GOSUB 4000
300 X$=MID$(X$,2,7)+K$:GOTO 260
310 PRINT CL$;:PRINT:Z$=L$(1):GOSUB 5000:GOTO 200
320 PRINT CL$;:IF X$=L$(8) THEN 340
330 Z$="NOPE! PLAY IT AGAIN, SAM.":GOSUB 5000:GOTO 200
340 PRINT CL$;:Z$="THE ALARM STOPS, AND THE DOOR MAGIC ALLY"
350 Z$=Z$+" OPENS!":GOSUB 2000:PRINT:PRINT
360 FOR D=1 TO DL:NEXT D:PRINT CL$;:C=2:POKE B+4,15
380 FOR S=1 TO 49
390 IF S<>1 AND S<>15 AND S<>23 AND S<>30 AND S<>37 AND S<>44 THEN 410
400 Z$=L$(C):GOSUB 2000:C=C+1:GOTO 420
410 FOR D=1 TO DS:NEXT D
420 DUR=VAL(MID$(D$,S,1))*120
430 POKE B+2,KA(ASC(MID$(V$(1),S,1))-64)
440 FOR D=1 TO DUR:NEXT D:POKE B+2,0:NEXT S
490 PRINT CL$;:GOSUB 3000
500 GOSUB 6000:IF K$=CHR$(3) THEN END
510 GOSUB 4000:GOTO 500
1000 IF LEN(N$)=WL THEN PRINT N$;:RETURN
1010 PRINT SPC((WL-LEN(N$))/2);N$;:RETURN
2000 IF LEN(Z$)<=WL THEN N$=Z$:GOSUB 1000:RETURN
2010 J=WL+1:K=1:FOR I=J TO 2 STEP -1
2020 IF MID$(Z$,I,1)="" THEN K=0:J=I:GOTO 2030
2030 NEXT I:N$=LEFT$(Z$,J-1):GOSUB 1000
2040 Z$=RIGHT$(Z$,LEN(Z$)-J+K):GOTO 2000
3000 PRINT:FOR I=1 TO 8:PRINT TAB(LM);CHR$(18);
3010 IF I<>6 THEN PRINT S$;:GOTO 3040
3020 FOR J=1 TO 9:PRINT MID$(A$(2),J,1);R$;
3030 NEXT J:PRINT "P":GOTO 3080
3040 FOR J=1 TO 9:KC=ASC(MID$(A$(3),J,1))
3050 IF I>6 OR KC=88 THEN PRINT R$;:GOTO 3070
3060 PRINT CHR$(144);CHR$(32-(KC-32)*(I=5));CHR$(5);
3070 PRINT S$;:NEXT J:PRINT
3080 NEXT I:PRINT TAB(LM);:FOR J=1 TO 10
3090 PRINT MID$(A$(1),J,1);" ";:NEXT J:PRINT:RETURN
4000 IF K$<"0" OR K$>"9" THEN RETURN
4010 K=KB(ASC(K$)-47):IF K=0 THEN RETURN
4020 POKE B+1,K:FOR D=1 TO 80:NEXT D

```

```

4030 POKE B+1,0:RETURN
5000 GOSUB 2000:FOR I=1 TO WH:PRINT:NEXT I
5010 Z$="PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GOSUB 6000:RETURN
6000 GET K$:ON -(K$="") GOTO 6000:RETURN
8000 DATA 11111,11111,11121,11111,11111
8010 DATA 11131,11111,11111,11222,2224
8020 DATA 1111G,FINPR,RRPNN,MKKKM,NMNKI
8030 DATA KIFII,IIIG,INPRR,RPNNP,PNMN
8080 DATA 191,195,199,201,203,207,209,212,215,217
8090 DATA 219,221,223,225,227,228,229,231
9000 DATA CDEFGABCDE,QWERTYUIOP
9010 DATA 23X567X90,Q2W3ER5T6Y7UI900P
9020 DATA 7,GFVB,LMDQ,QEFK,JKD,DXLI,PHYWXJ,MIBYHZR!
9030 DATA 11,LYK,REGMLZ,HPIA,LQXKF,NHVS,FLXKYNTKYY
9040 DATA MBS,KFWJDDPD,PI$,ELWFSY,NAWBHG,6,QZ
9050 DATA IFXDUM,GLHA,PJXUC,EBNYM,JVKCKQXK,7,MV
9060 DATA FCUARJ,QVRK,LFTQY,IFRCQ,TU,JLVXSDJ,6,RA
9070 DATA RSLW,MBAR,PRO,TGCMNUEY,KZYNP,6,EFSI
9080 DATA TC!PY,NZCJSR,KESPX,RWNWJ,EXNSHJ,5,NGC
9090 DATA KELVP,PIECU,MUBZR,QKFURP%,1,EYWJYNTUN

```



### SOLUTION TO LAST MONTH'S PUZZLE

When Bill saw that Linda had purchased the necessary ingredients for his favorite meal (fettuccine Alfredo and sugar cookies—the ingredients being pasta, milk, cheese, and sugar as shown in the illustration) he dropped four coupons into her shopping bag. Bill was using the coupons to direct Linda to four particular food shelves in the store—ones containing cheese, salad dressing, cake mix, and cat food. If Linda studied the brand names for each category of food in the order shown above, she would notice that by taking one brand name from each category she could assemble a rebus saying "Will you marry me?" (Wheel of the Wagon Cheese; Hugh Green Salad Dressing; Mary Homemaker's Cake Mix; and Meow Cat Food.) Responding in kind, the item Linda needed to make her dinner a success was Eye-Do Mascara.



## Next 8 Pages!!

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Desert Island  
**CONTEST!** Page 92  
 Win Free Software!!

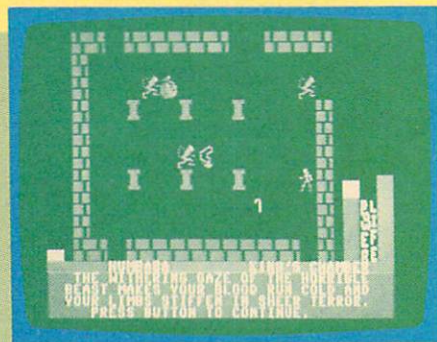
# K-POWER

Edited by Anne Krueger

## FOR THE COMPUTER GENERATION

Ever play a fantasy role-playing game and think, "I could create a better game than this!" Well, now's your chance. **Electronic Arts'** new **Adventure Construction Set** is a phenomenal new program that lets you build full-fledged adventure games, complete with four independently controlled characters, a variety of creatures, and a landscape.

Your voyagers grow in experience and accumulate powers, just like in **Ultima** or **Wizardry**. But you can put them into absolutely any environment you want. The choices are limitless. You also can play a full-length adventure, "**Rivers of Light**," which



### E. A.'s Adventure Construction Set.

comes on the disk.

Designer **Stuart Smith**, whose earlier credits include **Ali-Baba and the 40 Thieves** and **Heracles**, told K-POWER he's "tired of games that, once you play them, they're over." Construction sets let you have all the variety you want: "Make your own movies. Create history. Recreate history."

The Bible is computerized. Dictionaries and reference books are computerized. So, can the computerized version of **The Hitchhiker's Guide to the Galaxy** be far behind? Scour the software shelves—**Arthur Dent** has returned, in an all-text adventure crafted by who else: the riffraff at In-

## Software Scoop

Build Your Own Adventure  
 Hitchhike Through the Galaxy  
 Win \$1,000

**focom.** **Steve Meretzky**, the M.I.T.-wit guilty of **Planetfall** and **Sorcerer**, actually went to England, where he learned to speak a foreign language (British) and coauthored the game with **Douglas Adams**, author of the novels on which the game is based.

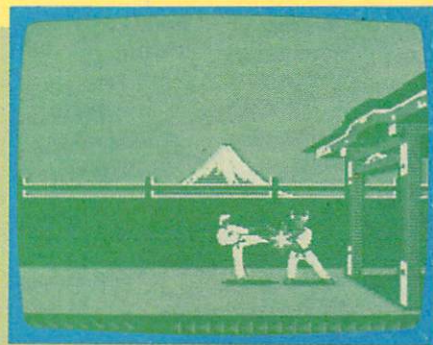
For those of you who've been asleep for the last couple of years and don't know about **Hitchhiker's** and the adventures of its zero hero, **Arthur Dent**, the books and game chronicle the misadventures of a lost soul suddenly dislocated from his quiet, conventional life in his quiet, conventional house on earth. His (your) house is torn down, his (your) planet is blown to bits, and he (or you, if you've got the wit-power to get so far) is beamed up into the galaxy, hurdling into one obstacle after another. If you've read one,

two, or three (there's a fourth on the way) of Adams' books, "don't panic;" you're in for brand-new surprises.



Alerting all artists or would-be artists! **Activision**, maker of a new, easy-to-use programming language on disk (for C 64)—**The Designer's Pencil**—has announced a contest. \$1,000 goes to the creator of the best program executed with **The Designer's Pencil**, in each of four categories—Short program (30 lines or less) and long program by authors 15 and under and 16 and older. Second prizes (\$500) and third prizes (Okidata printers) also will be awarded in each category. **Designer's Pencil** was designed by **Garry Kitchen**.

If you're wondering who's behind the sharp graphics in a lot of **Broderbund's** new games, you have **Gene Portwood** to thank. The company's creative director earned his stripes in **Walt Disney's** studios, where he helped animate such classics as **Peter Pan** and **Sleeping Beauty**. One of Portwood's newest prides is **Karateka**, an action/strategy game designed by **Jordan Mechner**, a college student. The game calls on you to control the karate skills of a young master determined to rescue his lady from the clutches of an evil warlord.

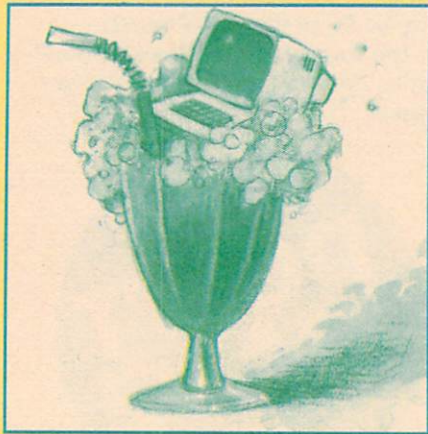


Broderbund's new **Karateka!**



## Who Sez Computers Aren't Funny?!

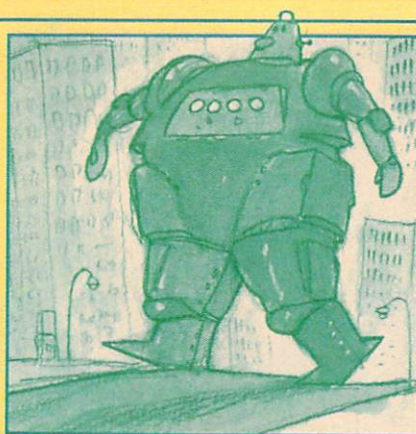
If you're in the mood to laugh, hoot, giggle, snort, and most of all—groan!—read on. K-POWER has assembled the wackiest collection of computer jokes you've ever seen. But credit where credit's due. You wouldn't be reading these jokes if it weren't for the hundreds of K-POWER readers who sent in their favorites for our "Make Me Laugh" contest. Ten winners received K-POWER T-shirts and a free piece of software. The winners are . . .



**Q.** How do you make a computer float? **A.** Two scoops of ice cream, root beer, and a computer! (Shyla Domaracki, 12, Des Plaines, Illinois)

**Q.** Why did the computer die suddenly? **A.** It was terminally ill. (Kirstine Urbanek, 13, Harper Woods, Michigan)

**Q.** What do you get when you cross a dwarf with a computer? **A.** A short circuit! (Todd Paulk, 12, Antioch, Tennessee)



**Q.** What does a 2-ton robot do? **A.** Anything it wants! (Blake Lindner, 14, Pinkneyville, Illinois)

One day in the Wild West, this computer went into a dance hall and ordered a sarsaparilla. As the day came to a close, the bartender asked the computer to pay the bill, which was \$1.50. The computer replied, "But sir, I only have 8 bits!" (Matt Jones, 16, Montevue, Idaho)

**Q.** What do you get when you cross a gorilla with a computer? **A.** A hairy reasoner. (Submitted by both Frank Roff, 15, Snohomish, Washington; and James A. Richards, 16, Hartford, Iowa)

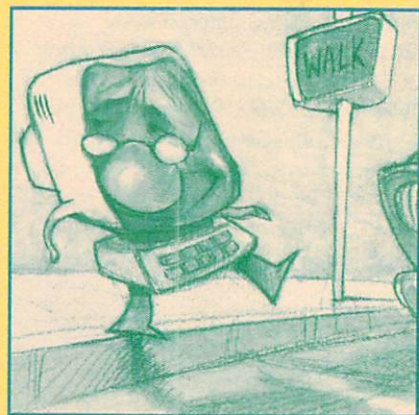
Once a girl had a computer/ Who ran programs to find her a suitor/ When one did not fit/ And the program just quit/ She decided the computer was cuter! (Marc Price, 14, Gaithersburg, Maryland)

**Q.** What are microchips? **A.** What little baby buffaloes leave behind on the prairie. (Submitted by both Blair Dillman, 13, Pittsford, New York; and Bob Orwick, 14, Lima, Ohio)

A computer hacker was in the airport. He had bought his ticket to Chicago, and had a little time to kill before his plane took off. He noticed a computerized weighing and fortune-telling machine. He dropped in a quarter and the card came out saying: "You are a computer hacker, 16 years old, weigh 140 lbs., and you're going to Chicago."

He thought to himself, "How can a machine know that much about me?" So he put in another quarter. The card came out. "You are a computer hacker, 16 years old, weigh 140 lbs., and you're going to Chicago."

"Absurd!" he thought, "Just a coincidence." So he put in a third quarter. "You are a computer hacker, 16 years old, weigh 140 lbs. You've messed around and missed your flight to Chicago." (Tommy L. Earnest Jr., 17, Athens, West Virginia.)



**Q.** Why did the computer cross the road? **A.** It was the chicken's day off. (Matt Frye, 11, Lucerne, Indiana)

## LOGON

L E T T E R S

### LOVES MUSIC PROGRAMS!

I really enjoy K-POWER. I was quite astounded, however, at your Microtones section. I am an ADAM owner and didn't think programming music on the ADAM was possible. But now, thanks to K-POWER, I am a music programmer. Actually, I was a music programmer. You see, something went wrong with my SmartBASIC tape. However, I will get a new one in three to four weeks. I want to know if SmartBASIC comes

in cartridge form. If not, is there anybody out there who can tell me how to get a backup copy of SmartBASIC? Please answer! Again, I want to compliment you on K-POWER.

RAY HILL, 16  
Romeoville, Illinois

Dear Ray,

Thanks for the compliments. Stay tuned to Microtones—you'll find new music programs there in each

issue. According to Coleco, SmartBASIC is not available on cartridge or disk. The SmartBASIC tape is copy protected so your only option is to get a new tape from Coleco.

Coleco says people can ruin their SmartBASIC tapes by turning the computer's power on or off when the tape is in. The tape should be inserted or removed only when the power is on. Any questions? Call the company's toll-free number: (800) 842-1225.

THE EDITORS



# DOCTOR KURSOR'S KLINIC

## Where did the word "boot" come from?

**DR. KURSOR:** The computer use of the word "boot" (as in "booting a disk") is directly related to those things you wear on your feet. Perhaps you've had, or seen, boots that could be pulled on using a pair of straps sewn in at the top.

In the old days when everyone wore boots, a person who made it up from nowhere, without anybody else's help, was often said to have "pulled himself up by his own bootstraps."

But what does that have to do with computers? Well, the first micros had little or no ROM. That meant that, when first turned on, they didn't even know how to read a program off a disk or tape. You had to put in a short program by hand that showed the computer how to read longer programs.

That program was called the "bootstrap"—or "boot"—program because it was all the computer needed to get itself going under its own power—to "pull itself up by its bootstraps."

Today, micros have that program built in (in ROM). When you turn the computer on, it runs the boot program, which gets the computer ready to run other programs.

You probably know that a disk operating system (DOS) contains the instructions the computer needs to read from and write onto a disk. Though DOS is sometimes stored inside the disk drive itself or

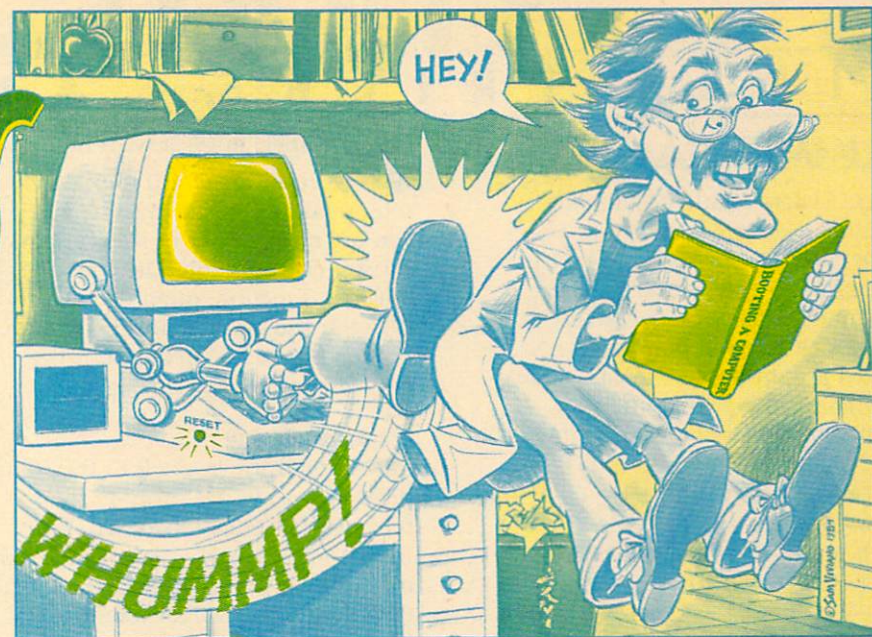


Illustration: Sam Viviano

on a ROM pack that plugs into the cartridge slot, it usually comes on a disk.

The bootstrap program contains just enough information to get the computer started reading DOS in from the disk. Once the beginning of DOS has been read in, it can take over reading in the rest. That's why starting a disk-based program—by turning the computer on or resetting it—is called "booting" the disk.

## How does a modem work, and can you have three-way lines?

**DR. KURSOR:** When your computer wants to talk to one of its peripherals, it does it through a port. If you have two computers in the same room, they can send messages back and forth if you connect their serial ports.

But suppose you want to hook up your computer to your friend Linda's, and she lives across town—or across the country? You can't buy cables that long!

But wait! You can get your computer to talk *over the phone* with Linda's by using a modem. A modem's just an electronic circuit that

translates—"modulates"—the digital signal that comes out of your computer's serial port (a series of 1s and 0s in electrical binary code) into a series of musical tones that can travel over the phone lines. One tone is used to mean "1," and a lower tone is used to signify "0."

Your modem also can translate back what's coming over the phone from Linda's computer into the form your computer's serial port can understand. That's called "demodulation."

Since it works both ways, we call it a *modulator-demodulator*—or *modem* for short!

When two standard 300-baud modems talk, one has to be set to originate mode and the other to answer mode. The one set to answer mode uses a higher pair of tones to send its 1s and 0s than the one in originate mode. That way, both modems can talk at the same time.

But modems are set up to work with only these two pairs of frequencies. So even if you could connect three different modems in some sort of conference call, you'd have more than one trying to talk on the same frequency, and confusion would result.

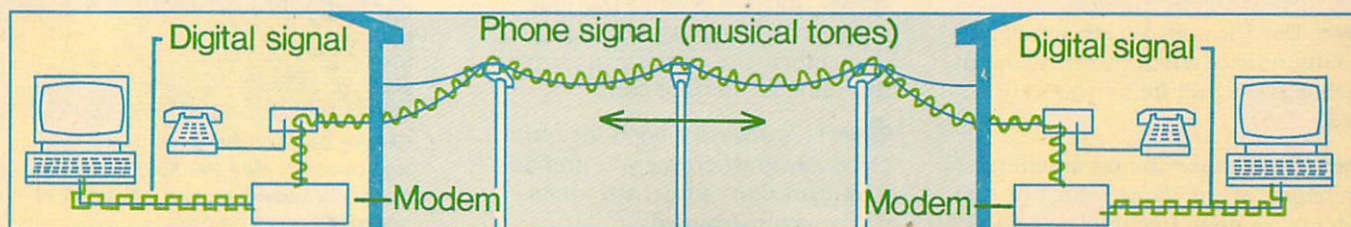


Diagram: Pat Lyons



# STRATEGY

## TIPS, TRICKS, AND HINTS

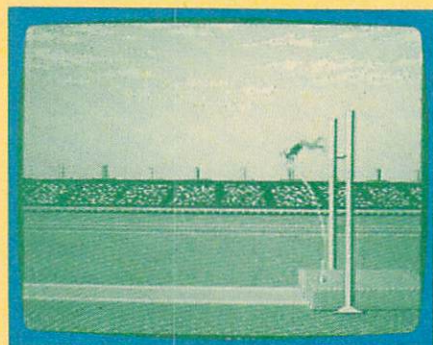
### SUMMER GAMES

Epyx. Sports simulation/arcade-strategy. Your mission: To out-perform computer or human opponents in eight events modeled after the Olympic contests. Sensitive, dynamic joystick control, plus terrific animated graphics make for an unbeatable go-for-the-gold simulation. (Hints and game for Commodore 64.)

#### The event: Pole Vault

Always grip the pole at the high mark. That way you're more likely to get over, though your accuracy may not be as good.

Make a mental mark on the screen to tell you when to pull down on the joystick and plant your pole.



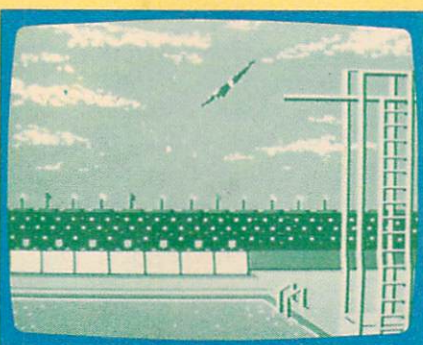
To remember, mark it with tape.

On jumps of 4.0 to 5.3 meters, push up on the joystick when you are one-quarter of the way up on the arc of your vault. On jumps of 5.4 to 5.8 meters, push up halfway through the arc. On jumps of 5.9 to 6.2 meters, push up at about three-quarters of the way through.

#### The event: Diving

Push the joystick to the right before jumping. Half way to the water push the stick down, left, and then up as quickly as you can. This maneuver gives you a higher difficulty factor, which will automatically improve your score.

On forward and backward dives, hold the joystick to the right



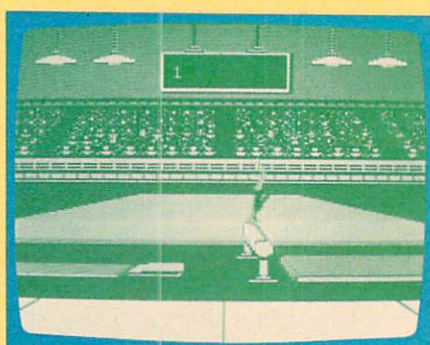
before jumping and push up (come out of your dive) when you reach the judges. On reverse dives, come out of your position just before entering the water.

It's tough to see where the waterline is. Attach a piece of paper onto the screen so you can best judge when to come out of the dive.

#### The event: Gymnastics

For a really super score, press the fire button when your gymnast is in the vertical upside-down position over the horse. This will give you enough power for at least two somersaults. Once you get that down, add an 180-degree twist.

—BRIAN MEFFORD, 12, E. Camden, Arkansas; THE SPECIAL KS



Three events in Epyx's *Summer Games* demand the utmost in joystick finesse: (from left to right) pole vault, diving, and gymnastics.

### SPY VS. SPY

First Star. Strategy/action. Your mission: To be the first spy to gather the necessary money and loot, stash it in your case, and leave the embassy in an awaiting airplane. (Hints and game for Apple, Atari, Commodore 64, and IBM PC.)

There are two ways to attack the enemy spy: Hit him in the stomach or bash him over the head. As a rule, go for the head when you're at a distance, and for the stomach when you're closer.

Use the split screen wisely, making note of where your opponent stashes traps and items you may need.

Sometimes the room where you begin, at the game's start or just after you've died, has only one door.

If you think your opponent will die next (and have to start all over again in that room) water-trap the door. That's a way to really aggravate your enemy.

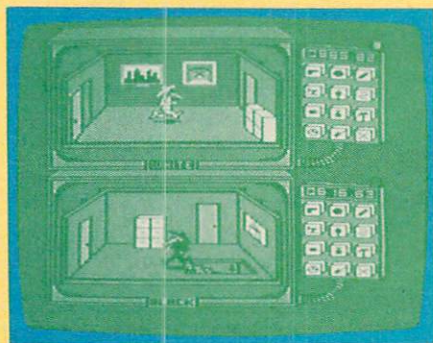
It's always a good idea to have some sort of booby-trap remedy in hand. That way if you trip off a trap, you'll have a chance of surviving.

Before heading for the airport, make sure you have all the required items. The guard will kill you if you're not fully equipped.

Sneak a peek at the map when your enemy is looking at it. Remember, the embassy floor plan is the same for both of you.

It's always a good idea to place a trap wherever you find an item. But don't forget the spots you've booby-trapped!

Develop a code to remember where you've set traps: under all TV sets or behind all pictures, for instance. Until your enemy gets a whiff of what you're up to, it's a way to avoid getting zapped by your own traps.—THE SPECIAL KS



Outwit and out-hit your underworld opponent in *Spy vs. Spy*, a split-screen scenario based on the antics of *Mad's* sadistic secret agents.



## WIZARDRY I

Sir-tech. Fantasy role-playing. Your mission: To descend into the dark depths of a dangerous dungeon. Map your way through a multileveled maze, pursue Werdna, and retrieve the wondrous amulet stolen from the overlord. (Hints and game for IBM and Apple.)

🔑 Camp in the room where you find the blue ribbon. "L"eave immediately, and you'll receive an extra blue ribbon. Give it to another character for use as a backup. You'll need the ribbon to use the elevator.

🔑 If you want to keep Werdna's amulet (it's worth millions), turn off the computer right after you meet Trebor, who sent you on your quest.

🔑 Here's a way to duplicate an item, such as a sword or potion, without having to pay for it twice.

1. Give the object to another character at Gilgamesh's tavern.
2. "R"emove the character who possessed it.
3. Take the object's new owner to

the first level of the dungeon.

4. Turn off the computer.
5. "R"ecover the original owner.

Both characters should now have the item. Try this trick a few times, because it doesn't always work.

🔑 Usually evil and good characters can't journey together. But here's a special procedure to get a Ninja (or other evil character) into a party with a Lord (or other good character): Take the evil character into the dungeon—alone or with others. Every time you encounter a friendly monster, leave in peace. After a few such encounters, your party will begin to change alignment—from evil to neutral. In other words, your Ninja will become neutral or

## HOW ELITE ARE THE ELITE?

| Character | Strength                  | Vitality | IQ | Piety | Agility | Luck |
|-----------|---------------------------|----------|----|-------|---------|------|
| Lord      | 15                        | 15       | 12 | 12    | 14      | 15   |
| Samurai   | 15                        | 14       | 11 | 10    | 10      | —    |
| Ninja     | 17 or 18 in all abilities |          |    |       |         |      |
| Bishop    | —                         | —        | 12 | 12    | —       | —    |

Elite characters are the most powerful voyagers in *Wizardry*. Here's a table to show what abilities your characters will need to join that elite corps.

good without losing any of its powers. To change good characters into evil ones, follow the same procedure, except attack all friendly monsters.

—ALAN CRAWTHOR, 15, *Waverly, Pennsylvania*; SCORPIA, *New York, New York*; THE SPECIAL KS

|                                                                                     |                         |        |
|-------------------------------------------------------------------------------------|-------------------------|--------|
|  | 1) 2 GARIAN RAIDERS (2) |        |
|                                                                                     | 2) 2 GARIAN MAGES (2)   |        |
|                                                                                     | HORATIO'S OPTIONS       |        |
|                                                                                     | F)IGHT                  | S)PELL |
|                                                                                     | R)UN                    | U)SE   |
|                                                                                     | P)ARRY                  |        |
|                                                                                     |                         |        |
| #                                                                                   | CHARACTER NAME          | CLASS  |
| 1                                                                                   | HORATIO                 | AC     |
| 2                                                                                   | IAGO                    | HITS   |
| 3                                                                                   | CRESSIDA                | STATUS |
| 4                                                                                   | GILDOENSTERN            |        |
| 5                                                                                   | PISITAI                 |        |

## H I N T H O T L I N E

### DALLAS QUEST

Datasoft. Graphic adventure. Your mission: To journey to the jungles of South America in search of a map from one "Chugalug" Jones. (Hints and game for Apple and Commodore 64.)

🔑 "WHO" wants the sunglasses?

🔑 Hang on to items you come across (shovel, bugle, tobacco, etc.). You may get more than one use out of them.

🔑 Although most snakes are green, you can still tickle them pink. —THE SPECIAL KS

**BLUE MAX**, Synapse. Strategy/arcade. Your mission: To fly through enemy territory and bomb the enemy city. (Hints and game for Atari.)

🔑 If you're on the verge of running out of fuel, fly as high as you can. When you do run out, you'll be able to glide the rest of the way onto the runway.

🔑 Avoid flying on the lower left of the screen to keep from crashing

into the enemy planes that fly there. —CAL JACOBSON, 14, *Spokane, Washington*; L.W. FISCHMAN, 16, *New York, New York*

**BEYOND CASTLE WOLFENSTEIN**, Muse Software. Arcade adventure. Your mission: To penetrate Hitler's bunker and assassinate him. (Hints and game for Apple and Commodore 64.)

🔑 Use your dagger as much as possible. It's silent, but deadly!

🔑 You may think you know where you are. Mapping will tell you for sure. —JOEY McARDLE, 15, *Mobile, Alabama*

**AZTEC**, Datamost. Arcade adventure. Your mission: To adventure into the Amazonian wilds, gather treasure, and avoid savage beasts. (Hints and game for Apple and Commodore 64.)

🔑 If you get caught in a water trap and you're out of dynamite, try "C"limbing.

For a quick way up to a higher level, "C"limb on some chests. —THE SPECIAL KS

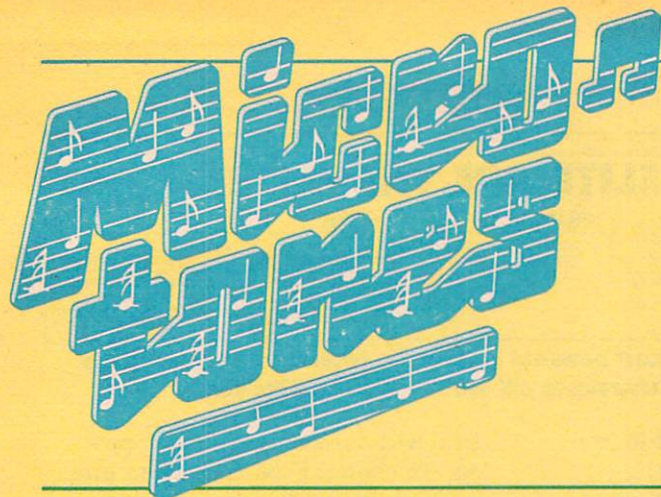
**PIRATE ADVENTURE**, Adventure International. Graphic adventure. Your mission: To collect treasure and booty and return to your home base. (Hints and game for most computers.)

🔑 The blood-stained book and a few well-placed words will help you out of some tight spots, even death.

🔑 The mongoose is a red heron. —DANNY HART, 13, *Pelham, New York*

Best of luck in your gaming, whether you're vaulting, assaulting, zapping, or booby-trapping. And let us know if you have any new tips or tricks. Send them to Hint Hotline, c/o K-POWER, 730 Broadway, New York, NY 10003. K-POWER will pay \$10 for hints the editors haven't heard of.

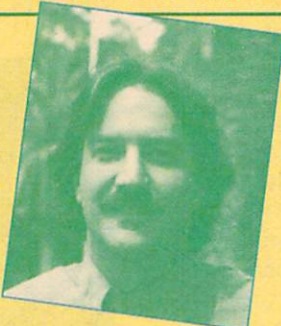




## MUSIC PROGRAMS BY JOEY LATIMER

Since I'm sure it won't be long before we live in outer space, I've created a few short "hyperspace sound paintings" to get you acquainted with your future surroundings.

These programs make extensive use of multivoice sound and white noise to produce layered "multitrack" sound effects. The results are audio excursions to places like *Halley's Comet Funpark*, *Laguna Beach Nebula*, and the *Secret Radio Galaxy*. Also included is a ringside seat for *White Dwarf vs. Red Giant*.



**Hackers' Note:** You can run these programs as they are, or adapt and use them as sound effects in your programs. Each hyperspace sound painting was designed to play up to three voices simultaneously, each with a unique sound. So, to isolate and test an individual voice, you must first turn off the other two. Experiment by changing the nature of these sound paintings, and before you know it, you'll be making your own.



### HALLEY'S COMET FUNPARK

I recently heard that several countries will be sending spaceships up to greet the famous comet on its next pass by Earth. My idea is to get up there before them, build a funpark, and transport all the kids in the world into space for the day.

#### ATARI

```
10 POKE 752,1:PRINT CHR$(125)
20 POSITION 9,1:PRINT "HALLEY'S COMET FUNPARK"
30 FOR X=155 TO 0 STEP -1
40 SOUND 1,X/16,8,15
50 IF X>80 THEN SOUND 2,X,10,15:GOTO 90
60 SOUND 1,0,0,0
70 IF (X=80 OR X=0) OR RND(1)<.05 THEN SOUND 2,2,8,6:
F=X:GOTO 90
80 IF F-X>RND(1)*5 THEN SOUND 2,0,0,0
```

```
90 FOR DE=1 TO (155-X)/4:NEXT DE
100 NEXT X:SOUND 1,0,0,0:SOUND 2,0,0,0
110 FOR DE=1 TO RND(1)*100+500:NEXT DE
120 FOR X=0 TO 65 STEP 0.3
130 SOUND 1,X/3,8,15
140 FOR DE=1 TO (155-X)/5:NEXT DE
150 SOUND 1,0,0,0:NEXT X:GOTO 30
```

#### COMMODORE 64

```
10 PRINT CHR$(147);TAB(9);"HALLEY'S COMET FUNPARK"
20 S=54272:FOR E=S TO S+28:POKE E,0:NEXT E
30 POKE S+5,34:POKE S+6,100
40 POKE S+12,37:POKE S+13,145:POKE S+24,15
50 FOR X=5 TO 145:POKE S+1,X:POKE S,X
60 IF X<65 THEN POKE S+8,X:POKE S+7,X:POKE S+11,33:GOT
0 110
70 POKE S+4,65:A=INT(RND(1)*50)+10
80 IF X/A<INT(X/A) OR X<65 THEN 100
90 POKE S+8,37:POKE S+7,162:POKE S+11,129:F=X:GOTO 110
100 IF X-F>RND(1)*5 THEN POKE S+11,0
110 FOR DE=1 TO X/1.2:NEXT DE
120 POKE S+4,129:NEXT X:POKE S+4,128:POKE S+11,0
130 FOR DE=1 TO (RND(1)*1000)+500:NEXT DE:POKE S+11,32
140 FOR X=11000 TO (RND(1)*5000)+500 STEP -50
150 FH=INT(X/256):FL=X-(256*FH)
160 POKE S+1,FH:POKE S,FL:POKE S+4,129
170 POKE S+8,FH:POKE S+7,FL:POKE S+11,129
180 FOR DE=1 TO X/300:NEXT DE
190 POKE S+4,65:POKE S+11,65:NEXT X:GOTO 50
```



### LAGUNA BEACH NEBULA

This nebula emits detectable noises that are remarkably similar to those heard in the dreams of sunbathers who fall asleep on Laguna Beach.

#### COMMODORE 64

```
10 PRINT CHR$(147);TAB(8);"THE LAGUNA BEACH NEBULA"
20 S=54272:FOR E=S TO S+28:POKE E,0:NEXT E
30 POKE S+5,255:POKE S+6,255
40 POKE S+12,255:POKE S+13,255
50 POKE S+19,34:POKE S+20,100
60 POKE S+8,244:POKE S+7,243:POKE S+11,129
70 FOR Z=3 TO 15 STEP 0.7
80 POKE S+24,Z:FOR DE=1 TO 50:NEXT DE:NEXT Z
90 A=(RND(1)*6500)+2000
100 B=(RND(1)*500)+350
110 FOR X=A TO B STEP -65
120 FH=INT(X/256):FL=X-(256*FH)
130 POKE S+1,FH:POKE S,FL:POKE S+4,129
140 FOR DE=1 TO (RND(1)*100):NEXT DE:NEXT X
150 FOR Z=15 TO 3 STEP -0.02:POKE S+24,Z:NEXT Z
160 POKE S+4,128
170 FOR DE=1 TO (RND(1)*700)+300
180 IF RND(1)>.02 THEN 230
190 POKE S+15,244:POKE S+14,103:POKE S+18,33
200 FOR T=1 TO 150:NEXT T
210 POKE S+15,217:POKE S+14,189
220 POKE S+18,32
230 IF RND(1)>.01 THEN 280
240 POKE S+15,172:POKE S+14,210:POKE S+18,33
250 FOR T=1 TO 50:NEXT T
260 POKE S+15,183:POKE S+14,25
270 FOR T=1 TO 100:NEXT T:POKE S+18,32
280 NEXT DE:GOTO 70
```

#### VIC-20

```
10 PRINT CHR$(147);" LAGUNA BEACH NEBULA"
20 A=INT(RND(1)*20)+170
30 B=INT(RND(1)*20)+190
```



```

40 FOR X=B TO A STEP -.05
50 POKE 36877,X
60 FOR Y=3 TO 15:POKE 36878,Y
70 FOR DE=1 TO (RND(1)*100)+200:NEXT DE:NEXT Y
80 FOR Y=15 TO 3 STEP -1:POKE 36878,Y
90 FOR Z=1 TO (RND(1)*20)+10
100 FOR Q=0 TO 3 STEP 3:IF RND(1)>.02 THEN 160
110 POKE 36876,253-Q
120 FOR T=1 TO 50:NEXT T
130 POKE 36876,251-Q
140 FOR T=1 TO 40:NEXT T
150 POKE 36876,0
160 NEXT Q
170 NEXT Z,Y,X:GOTO 20

```



## WHITE DWARF VS. RED GIANT

This is a classic confrontation between two types of stars. One has made the mark and is trying to stay on top, while the other is up-and-coming and just got a new agent.

### ATARI

```

10 DIM RN(5),DR(5),W(2)
20 PRINT CHR$(125)
30 POSITION 8,0:PRINT "WHITE DWARF VS. RED GIANT"
40 FOR X=1 TO 5:READ R,D
50 RN(X)=R:DR(X)=D:NEXT X
60 READ A,B:W(1)=A:W(2)=B
70 SOUND 2,125,8,6
80 FOR X=1 TO 5:FOR T=1 TO DR(X)
90 SOUND 1,RN(X),10,15
100 IF X=2 OR X=4 THEN SOUND 3,20,8,15
110 FOR DE=1 TO 70:NEXT DE:SOUND 3,0,0,0
120 SOUND 1,0,0,0:NEXT T:NEXT X
130 IF RND(1)>.6 THEN 80
140 SOUND 2,2,8,6
150 FOR T=1 TO 2:FOR X=1 TO 2
160 SOUND 1,W(X),14,15
170 FOR DE=1 TO 70:NEXT DE:SOUND 1,0,0,0
180 NEXT X:NEXT T
190 IF RND(1)>.6 THEN 140
200 GOTO 70
1000 DATA 243,2,217,2,204,2,182,1,162,1,42,64

```

### TI-99/4A

```

10 RANDOMIZE
20 DIM RN(5),DR(5),W(2)
30 CALL CLEAR
40 PRINT TAB(2);"WHITE DWARF VS. RED GIANT"
50 FOR X=1 TO 5
60 READ RN(X),DR(X)

```

```

70 NEXT X
80 READ W(1),W(2)
90 FOR X=1 TO 5
100 FOR T=1 TO DR(X)
110 IF (X=2)+(X=4) THEN 140
120 CALL SOUND(175,RN(X),0)
130 GOTO 150
140 CALL SOUND(175,RN(X),0,-6,0)
150 NEXT T
160 NEXT X
170 IF RND>.6 THEN 90
180 FOR T=1 TO 2
190 FOR X=1 TO 2
200 CALL SOUND(175,W(X),3,-1,3)
210 NEXT X
220 NEXT T
230 IF RND>.6 THEN 180
240 GOTO 90
1000 DATA 131,2,147,2,156,2,175,1,196,1,784,523

```



## SECRET RADIO GALAXY

All the spacey radio broadcasts that you've always wanted to hear but couldn't quite tune in on your radio, come from this galaxy.

### TI-99/4A

```

10 RANDOMIZE
20 CALL CLEAR
30 PRINT TAB(5);"SECRET RADIO GALAXY"
40 X=150
50 Y=150
60 IF RND>.5 THEN 80
70 X=INT(15000*RND)+150
80 IF RND>.5 THEN 100
90 Y=INT(3000*RND)+150
100 CALL SOUND((200*RND)+100,-(INT(8*RND)+1),0,X,0,Y,0)
110 GOTO 60

```

### VIC-20

```

10 PRINT CHR$(147);" SECRET RADIO GALAXY"
20 POKE 36878,10
30 X=200
40 IF RND(1)>.5 THEN X=(RND(1)*50)+200
50 IF RND(1)>.4 THEN 70
60 POKE 36877,RND(1)*255
70 POKE 36876,RND(1)*15+215
80 POKE 36874,X
90 FOR T=1 TO 50:NEXT T
100 POKE 36874,0:IF RND(1)>.6 THEN POKE 36876,0
110 GOTO 40

```

# M I C R O N O T E S

**Tech-Sketch, Inc.** recently worked with a rock musician to develop the **Music Port**, a keyboard for the C 64 which, like the hordes of others on the market, lets nonprofessionals make great computer music, too. The light-pen manufacturer had help from **Bruce Brody**, who composed the score for the movie *Diner* and played keyboards on **John Waite's** new album (which includes the hit "Missing You"). The \$149 package includes a three-octave keyboard and software with songs and 15 preset sounds (ranging from harp-sichord to a full symphony). The synthesizer portion enables you to double-track music, create (and save) accompaniments, design sounds, change the presets,

and play your compositions back at any tempo. As for the tie-in to light pens: Tech-Sketch plans a software enhancement so you can compose music by moving a light pen across a staff on your screen.

You can "play" composer, musician, or sound engineer now—with **Tom Snyder's** new software for the C 64 and Atari. With **Rock 'n' Rhythm**, one to three players control melody, pitch, tempo, volume, and lighting to make multitrack compositions, which are stored in a jukebox you see on-screen. The jukebox can play back your compositions as well as other songs included on the disk. **Rock 'n' Rhythm** is available for \$32 from **Spinnaker**. —LINDA WILLIAMS



# COMPU COPIA

## SHORT - SHORT PROGRAMS

### Apple & ADAM/3-D SURFACE PLOTTER

```

10 DIM G(43),P(27,17)
20 HGR2:HCOLOR= 3
30 FOR I = 1 TO 43:G(I) = 159-(6*(I-27))*(I > 27):NEXT
 I
40 Y = -8:FOR I = 127 TO 31 STEP -6
50 X = -13:FOR J = 128-I TO 284-I STEP 6:JC = (J+5)/6
60 Z = SIN(.05*(X*X+Y*Y))*5
70 IF Z+I < 0 THEN Z = -I
80 IF Z+I <= G(JC) THEN 110
90 IF J = 128-I THEN HPLLOT J,G(JC):GOTO 130
100 HPLLOT TO J,G(JC):GOTO 130
110 G(JC) = Z+I:IF J = 128-I THEN HPLLOT J,Z+I:GOTO 130
120 HPLLOT TO J,Z+I
130 P(X+14,Y+9) = G(JC):X = X+1:NEXT J:Y = Y+1:NEXT I
140 FOR X = 1 TO 27:HPLLOT 6*X-5,P(X,1)
150 FOR Y = 2 TO 17:HPLLOT TO 6*(X+Y)-11,P(X,Y)
160 NEXT Y:NEXT X:FOR X = 1 TO 27
170 HPLLOT 6*X-5,P(X,1) TO 6*X-5,159:NEXT X
180 FOR Y = 2 TO 17
190 HPLLOT 6*Y+151,P(27,Y) TO 6*Y+151,165-Y*6:NEXT Y
200 HPLLOT 1,159 TO 157,159 TO 253,63

```

### TRS-80 Color Computer/3-D SURFACE PLOTTER

```

10 DIM G(43),P(27,17)
20 PMODE 3,1:SCREEN 1,0:PCLS:COLOR 3
30 FOR I=1 TO 43:G(I)=159+(6*(I-27))*(I>27):NEXT I
40 Y=-8:FOR I=127 TO 31 STEP -6
50 X=-13:FOR J=128-I TO 284-I STEP 6:JC=(J+5)/6
60 Z=SIN(.05*(X*X+Y*Y))*5

```

```

70 IF Z+I<0 THEN Z=-I ELSE IF Z+I<=G(JC) THEN 100
80 IF J<>128-I THEN LINE -(J,G(JC)),PSET:GOTO 130
90 LINE (J,G(JC))-(J,G(JC)),PSET:GOTO 130
100 G(JC)=Z+I
110 IF J<>128-I THEN LINE -(J,Z+I),PSET:GOTO 130
120 LINE (J,Z+I)-(J,Z+I),PSET
130 P(X+14,Y+9)=G(JC):X=X+1:NEXT J:Y=Y+1:NEXT I
140 FOR X=1 TO 27:I=6*X-5
150 LINE (I,P(X,1))-(I,P(X,1)),PSET
160 FOR Y=2 TO 17:LINE -(6*(X+Y)-11,P(X,Y)),PSET
170 NEXT Y,X:FOR X=1 TO 27
180 LINE (6*X-5,P(X,1))-(6*X-5,159),PSET:NEXT X
190 FOR Y=2 TO 17:I=6*Y+151
200 LINE (I,P(27,Y))-(I,165-Y*6),PSET:NEXT Y
210 LINE (1,159)-(157,159),PSET:LINE -(253,63),PSET
220 GOTO 220

```

### Modification for Atari 800 & 800XL/3-D SURFACE PLOTTER

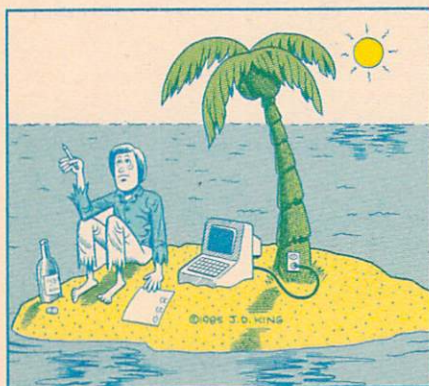
Use the ADAM & Apple version, with the following alterations: Change HPLLOT to PLOT in lines 90, 110, and 140. Change HPLLOT TO to DRAWTO in lines 100, 120, and 150. Finally, change lines 10, 20, 170, 190, and 200 to read as follows:

```

10 DIM G(43),P(27,17):GRAPHICS 8
20 SETCOLOR 2,12,2:COLOR 1:PRINT #6,CHR$(125)
170 PLOT 6*X-5,P(X,1):DRAWTO 6*X-5,160:NEXT X
190 PLOT 6*Y+151,P(27,Y):DRAWTO 6*Y+151,165-Y*6:NEXT Y
200 PLOT 1,159:DRAWTO 157,159:DRAWTO 253,64

```

## DESERT ISLAND CONTEST



If you were stranded on a desert island with your computer, what three pieces of software would you want with you? Would you want a word-processing program so you'd be able to send messages in a bottle? Would you want a really thrilling arcade-style game? Or a data-base program that would help you keep track of all the species of crawly and prickly things sharing the desert space with you? Let us know! Name names, plus tell us what makes those programs so special that they warrant a spot in your desert-island digs. In a future issue we'll let you know what software was most popu-

lar with K-POWER readers stranded on a desert island. Plus, we'll award a surprise software package to 10 randomly picked winners! So, fill out and send in the contest form below today! We'll have to receive your en-

try by Feb. 22. Don't forget to tell us what kind of computer you own.

Send to: K-POWER Desert Island Contest, c/o K-POWER, 730 Broadway, New York, NY 10003.

If I were stranded on a desert island with my computer, I'd want the following three pieces of software (brand names) along:

---



---



---

because \_\_\_\_\_

---



---



---

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Telephone number (\_\_\_\_) \_\_\_\_\_  
 Age \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_  
 Computer(s) I use \_\_\_\_\_



# WHAT'S IN STORE

## NEW HARDWARE ANNOUNCEMENTS

### COMPUTERS

#### Epson Geneva/PX-8

MANUFACTURER: Epson America, Inc.,  
2780 Lomita Blvd., Torrance, CA  
90505; (213) 539-9140  
PRICE: \$995



Epson, best known as the world's largest computer printer manufacturer, continues to make brave advances in the microcomputer field. The powerful Epson Geneva/PX-8 represents a new breed of lap-type computers with more memory, larger screen displays, and best-selling software built in. The 64K RAM Geneva, which includes MicroPro software (spreadsheet, scheduling, and the ever-popular word processor, *WordStar*), offers nearly everything a traveling computerist could need. Unlike many new computers, the Geneva is not IBM-compatible, since it uses the CP/M operating system.

The Geneva's LCD flip-top screen displays eight 80-character lines at a time, twice the four-line standard of earlier lap computers, including the Epson HX-20. It has an RS-232 serial interface port for modem hookup, a speaker for words or music, and a clock/calendar. Options include a 3½-inch battery-operated disk drive (to run CP/M programs), memory expansion to 184K, and a thermal printer.

### MONITORS

#### AppleColor Monitor 100

MANUFACTURER: Apple Computer, Inc.,  
20525 Mariani Ave., Cupertino, CA  
95014; (408) 996-1010  
PRICE: \$599

Apple finally has manufactured a color monitor for use with its big-selling Apple IIe, III, and III plus computers, and it's well-suited for both text and graphics. The 12-inch screen displays text or graphics in either RGB (it has separate "guns"

for transmitting red, green, and blue, so images appear sharper than on a regular color monitor) or green/monochrome. In the latter mode, the monitor displays 80 columns sharp enough for word processing and other text-related tasks—the advantage of an RGB over a composite-color monitor. A tilting mechanism allows the user to adjust the viewing angle, and an antireflective screen surface effectively reduces glare.

Apple's new Extended 80-column Text/AppleColor Card (\$299) is needed to connect the monitor to the IIe. Apple II/II plus owners need an RGB interface card, currently available from third-party manufacturers, in order to use the monitor. Apple says it will soon release an RGB color adapter for the IIc.

### INTERFACES

#### Deluxe RS232C Interface

MANUFACTURER: Omnitronix Inc., P.O.  
Box 43, Mercer Island, WA 98040;  
(206) 236-2983  
PRICE: \$39



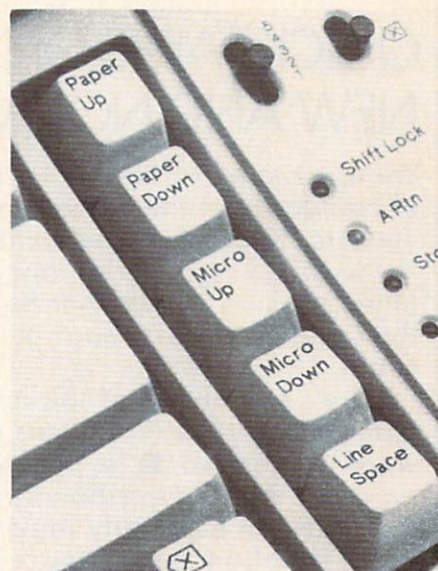
The Commodore 64 has a nonstandard serial interface, restricting modem options to those specifically designed for it. Omnitronix's Deluxe RS232C interface solves this problem by plugging directly into the user I/O port, allowing the C 64 to connect to any standard modem, including the Hayes Smartmodem. The interface comes complete with a Type-In BASIC terminal program and tutorial on how to use the RS-232 port.

### PRINTERS

#### IBM "Selectric" System/2000 typewriter/printers

MANUFACTURER: IBM Information Systems Group, 900 King St., Rye


Brook, NY 10573; (914) 934-4488  
PRICE: \$1,295 (Quietwriter 7);  
\$1,045 (Wheelwriter 5); \$795  
(Wheelwriter 3)



IBM knows how to make computers. And it knows how to make typewriters. But IBM has earned little recognition in the printer market until recently, when it pooled its technological know-how to produce typewriter/printers with microprocessors. Its new "Selectric" System/2000 series consists of three typewriters which can, with a \$150 Printer Option and a \$60 Feature Adapter Option, connect to an IBM computer as a printer.

The most advanced of the three new models, the Quietwriter 7, employs "resistive ribbon" print technology—it actually heats up to 40 electrodes on the print head, which transfer ink onto the paper in an almost soundless process. With a multiline buffer, the user can speedily make corrections on previously typed lines. It prints unidirectionally at between 40 and 60 cps, depending on which of the four pitches (characters per inch) is in use.

At a slower 16 cps are the Wheelwriter 3 and Wheelwriter 5. Like the Quietwriter 7, the Wheelwriter 5 has a multiline buffer, while the Wheelwriter 3 has one-line buffer to make corrections on the line being typed.

IBM offers an optional 50,000-word spelling checker (\$150), which will proofread what's typed and signal misspellings—a must for those who hate fumbling through a dictionary. The Spell Check card plugs into the Feature Adapter, which snaps onto the back of the typewriter. 



# WHAT'S IN STORE SOFTWARE GUIDE

## QUICK TAKES ON SOFTWARE— NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart.

Here's a rundown of the rating categories and what they mean: **●** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system, in the games reviews, the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

### HOME BUSINESS/HOME MANAGEMENT

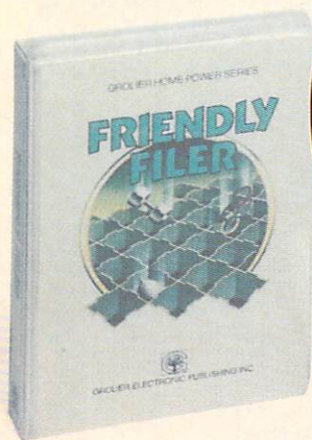
| Title<br>Manufacturer<br>Price                                                                                                               | Brief<br>description                                                                                                                                                                                                                      | Hardware/<br>Equipment<br>required                                                            | Backup<br>policy                                        | Ratings     |             |             |             |           |             |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------|-------------|-------------|-------------|-----------|-------------|
|                                                                                                                                              |                                                                                                                                                                                                                                           |                                                                                               |                                                         | <b>●</b>    | <b>D</b>    | <b>EH</b>   | <b>GQ</b>   | <b>EU</b> | <b>V</b>    |
| FANTASTIC FILER<br>Micro-W Distributing, Inc.<br>1342 B, Route 23<br>Butler, NJ 07405<br>(201) 838-9027<br>\$29.95 ©1984                     | Easy-to-use electronic file system includes prepared formats for home applications. Major flaw: Category names disappear when you type information into a record, making data entry difficult. —AKER                                      | C 64 (d.).                                                                                    | 90-day warranty; \$5 fee thereafter or for backup copy. | ★<br>★<br>★ | ★<br>★<br>★ | ★<br>★<br>★ | N/A         | E         | ★<br>★<br>★ |
| GET ORGANIZED!<br>Electronic Arts<br>2755 Campus Drive<br>San Mateo, CA 94403<br>(415) 571-7171<br>\$199.99 ©1984                            | Word processor plus calculator, address book, notepad, index-card filing system, and communications package. Best suited for college students, professionals, freelancers, or homemaker active in social/political activities.† —TAETZSCH | Reviewed on IBM PC/PCjr, 256K (d. w/DOS 2.0). Modem, RS-232 interface for telecommunications. | 90-day warranty; \$7.50 fee thereafter.                 | ★<br>★<br>★ | ★<br>★<br>★ | ★<br>★<br>★ | ★<br>★<br>★ | E         | ★<br>★<br>★ |
| SUPERBASE<br>Precision Software, Inc.<br>3003 Summer St.<br>Stamford, CT 06905<br>(203) 326-8649<br>\$149.95 (Apple)<br>\$99 (C 64) ©1983-84 | Retrieve data in seconds; store and organize huge amounts of information in records with as many as 127 different categories. Powerful data-base manager best for small businesses. —WILSON                                               | Reviewed on Apple IIe/IIc, 64K (d.). Also for C 64 (d.).                                      | Backup provided.                                        | ★<br>★<br>★ | ★<br>★<br>★ | ★<br>★<br>★ | ★<br>★<br>★ | A         | ★<br>★<br>★ |
| SYNFILE+<br>Synapse Software<br>5221 Central Ave.<br>Richmond, CA 94804<br>(415) 527-7751<br>\$79.95 ©1984                                   | Store, sort, and retrieve information in data-base manager with room for up to 66 categories per record. Suitable for most small-business and home-management tasks, and for use with SynCalc and AtariWriter.† —McCARTNEY                | Atari Home Computers, 48K (d.).                                                               | 90-day warranty; \$7 fee thereafter or if user-damaged. | ★<br>★<br>★ | ★<br>★<br>★ | ★<br>★<br>★ | N/A         | E         | ★<br>★<br>★ |

**RATINGS KEY** ● Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart



# ANNOUNCING...

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------|------------------|------------------|------------------|----|------------------|--|
| Title<br>Manufacturer<br>Price                                                                                                                                                                                                                                  | Brief<br>description                                                                                                                                                                                           | Hardware/<br>Equipment<br>required                                                                                                | Backup<br>policy                                                                            | Ratings          |                  |                  |                  |    |                  |  |
|                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                |                                                                                                                                   |                                                                                             | O                | D                | EH               | GQ               | EU | V                |  |
| AEGEAN VOYAGE<br>Spinnaker Software<br>One Kendall Square<br>Cambridge, MA 02139<br>(617) 494-1200<br>\$32.95 ©1984                                                                                                                                             | Sail the Aegean seas. Sample rewards and taste perils faced by mythic voyagers. Accumulate treasures as you sail from isle to isle in game lacking involvement and depth of other Spinnaker games.<br>—SUMMERS | C 64 (cass. and cart.). Joystick.                                                                                                 | 30-day warranty (includes user-damaged); \$5 fee thereafter; \$12 fee for backup.           | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |  |
| BANNERCATCH<br>Scholastic Software<br>730 Broadway<br>New York, NY 10003<br>(212) 505-3000<br>\$29.95 (Atari, C 64)<br>\$39.95 (Apple, IBM PC/PCjr) ©1984                                                                                                       | Computerized version of Capture the Flag pits kids together against a team of robots. Encourages cooperation and helps teach binary math. For ages 9 (sometimes younger) and up. †<br>—SUMMERS                 | Reviewed on C 64 (d.). Also for Apple II series, 48K (d.); Atari Home Computers, 48K (d.); IBM PC/PCjr, 64K (d.). Joysticks.      | 60-day warranty; \$10 fee for 10 subsequent months.                                         | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |  |
| CHARLIE BROWN'S ABC'S<br>Random House Software<br>201 E. 50th St.<br>New York, NY 10022<br>(800) 638-6460<br>\$39.95 ©1984                                                                                                                                      | Animated alphabet program uses "Peanuts" characters to help kids learn letters. Cartoon sequence accompanies each letter. Most effective when parents participate. †—BUMGARNER                                 | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.).                                                                        | 90-day warranty; \$5 fee for 9 subsequent months.                                           | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |  |
| THE INCREDIBLE LABORATORY<br>Sunburst Communications<br>39 Washington Ave.<br>Pleasantville, NY 10570<br>(800) 431-1934<br>\$55 ©1983                                                                                                                           | Mix goose grease, black ice, or other ingredients to create an assortment of monsters in colorful activity that helps kids with trial and error problem-solving, and recognizing patterns. †<br>—MORRIS        | Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d.). Color TV/monitor recommended.          | 90-day warranty (includes user-damaged); \$10 fee thereafter; backup supplied with program. | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |  |
| THE LEARNING LINE<br>Eric Software Publishing<br>1713 Tulare St., Suite 122<br>Fresno, CA 93721<br>(209) 237-0989<br>\$29.95 ©1984                                                                                                                              | Early and prereaders, ages 3–7, match clothes, letters, numbers, and other objects in colorful, entry-level program.<br>—FRANK                                                                                 | Apple II series, 48K (d.). Joystick optional.                                                                                     | Unlimited lifetime warranty (includes user-damaged).                                        | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |  |
| MICROZINE No. 6<br>Scholastic Software<br>730 Broadway<br>New York, NY 10003<br>(212) 505-3000<br>\$39.95 ©1984                                                                                                                                                 | Manage and peruse files of Olympic news and history; skim data base of free goodies; make sounds with a noisemaking utility; adventure in prehistoric times—all in magazine on a disk.<br>—MORRIS              | Apple II series, 48K (d.). Color TV/monitor recommended.                                                                          | 60-day warranty; \$10 fee for 10 subsequent months.                                         | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |  |
| SNOOPY TO THE RESCUE<br>Random House Software<br>201 E. 50th St.<br>New York, NY 10022<br>(800) 638-6460<br>\$39.95 ©1984                                                                                                                                       | Arcade game features Snoopy racing through many levels, adding numbers in boxes around the screen. Fun, but limited to addition of one-digit numbers.<br>—BUMGARNER                                            | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.). Joysticks recommended.                                                 | 90-day warranty; \$5 fee for 9 subsequent months.                                           | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | A  | ★<br>★<br>★      |  |
| STORY MAKER<br>Sierra Inc.<br>P.O. Box 485<br>Coarsegold, CA 93614<br>(209) 683-6858<br>\$34.95 ©1984                                                                                                                                                           | Simple word-processing and graphics program allows kids to compose stories or illustrated journals. Encourages creative writing for kids in the upper half of 7–14 age group. †<br>—MORRIS                     | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.); IBM PC/PCjr, 64K (d.). Extra blank disk. Color TV/monitor recommended. | 90-day warranty; \$5 fee thereafter or if user-damaged.                                     | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | A  | ★<br>★<br>★      |  |
| THE SWEET SHOPPE<br>Eric Software Publishing<br>1713 Tulare St., Suite 122<br>Fresno, CA 93721<br>(209) 237-0989<br>\$29.95 ©1984                                                                                                                               | Basic counting, simple addition and subtraction practice for young children, 4–7, just starting on the computer. Challenge doesn't increase with child's ability.<br>—FRANK                                    | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.). Joystick.                                                              | Unlimited lifetime warranty (includes user-damaged).                                        | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |  |
| TELLY TURTLE<br>Coleco Industries Inc.<br>999 Quaker Lane S.<br>West Hartford, CT 06110<br>(203) 725-6000<br>\$24 (ADAM)<br>\$29 (from Hayden for Atari and C 64) ©1983–84                                                                                      | Commands represented by pictures, or icons, and easy-to-use joystick control introduce kids 5–15 to Logo-like programming. Best for younger kids. †<br>—DAVENPORT                                              | Reviewed on ADAM (cass.). Also from Hayden Software for Atari Home Computers, 48K (d.); C 64 (d.) Joystick.                       | 90-day warranty.                                                                            | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | E  | ★<br>★<br>★<br>★ |  |
| RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart |                                                                                                                                                                                                                |                                                                                                                                   |                                                                                             |                  |                  |                  |                  |    |                  |  |



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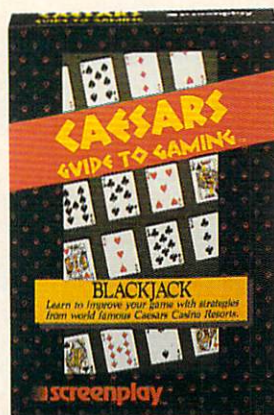


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**GAMES** REVIEWS BY JAMES DELSON

| Title<br>Manufacturer<br>Price                                                                                                                                      | Brief<br>description                                                                                                                                                                                             | Hardware/<br>Equipment<br>required                                                                                                                                           | Backup<br>policy                                                      | Ratings          |                  |                  |                  |    |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------|------------------|------------------|------------------|----|------------------|
|                                                                                                                                                                     |                                                                                                                                                                                                                  |                                                                                                                                                                              |                                                                       | O                | D                | PS               | GQ               | EU | V                |
| THE ACTIVISION<br>DECATHALON<br>Activision<br>2350 Bayshore Frontage<br>Road<br>Mountain View, CA 94043<br>(415) 960-0410<br>\$31.95 ©1984                          | Jiggle the joystick in this exhausting but enjoyable simulation of the modern decathlon. Dash, hurdles, discus-throw, pole vault, and others add up to tired arms but fun times, for ages 8+.                    | Reviewed on C 64 (d.). Also for Atari Home Computers, 48K (d.). Joystick.                                                                                                    | 1-year warranty.                                                      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★<br>★      |
| F-15 STRIKE EAGLE<br>MicroProse Software<br>10616 Beaver Dam Road<br>Hunt Valley, MD 21030<br>(301) 667-1151<br>\$34.95 ©1984                                       | Pilot a sophisticated F-15 into combat against 7 targets. Fully animated flight simulator has a play system that is MicroProse's best to date. A must for action fans, ages 12+.                                 | Reviewed on Atari Home Computers, 48K (d.). Also for C 64 (d.). Planned for Apple II series. Joystick.                                                                       | 30-day warranty; \$10 fee thereafter, if user-damaged, or for backup. | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | D  | ★<br>★<br>★<br>★ |
| JUPITER MISSION 1999<br>Avalon Hill<br>4517 Harford Road<br>Baltimore, MD 21214<br>(301) 254-5300<br>\$50 ©1984                                                     | One player, or several playing as a crew, learns to fly a spaceship, defend it and, repair it when it's damaged, while voyaging to Jupiter. Good for ages 12+.                                                   | Atari Home Computers, 48K (d.). Version planned for C 64. Joystick.                                                                                                          | Lifetime warranty; \$10 fee if user-damaged.                          | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | A  | ★<br>★<br>★      |
| LEGIONNAIRE<br>Avalon Hill<br>4517 Harford Road<br>Baltimore, MD 21214<br>(301) 254-5300<br>\$40 (d.); \$35 (cass.)<br>\$25 (C 64 cass.)<br>\$30 (C 64 d.) ©1983-84 | Introductory war game based on campaigns of Julius Caesar in Gaul, 58-51 B.C. Solitaire play system good for beginners, and challenges experts, also. For ages 12+.                                              | Reviewed on Atari Home Computers, 48K (d. or cass.). Also for Apple II series, 48K (d.); C 64 (d. and cass.). Joystick.                                                      | Lifetime warranty; \$10 fee if user-damaged.                          | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | E  | @                |
| MR. ROBOT AND HIS<br>ROBOT FACTORY<br>Datamost, Inc.<br>20660 Nordhoff St.<br>Chatsworth, CA 91311<br>(818) 709-1202<br>\$34.95 ©1983                               | Arcade game with "construction set" feature lets you design and play on your own screens. As much fun as <i>Lode Runner</i> , but with better graphics. Good for ages 10+.                                       | Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d.). Joystick.                                                                         | Unlimited warranty.                                                   | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | E  | ★<br>★<br>★<br>★ |
| PARK PATROL<br>Activision<br>2350 Bayshore Frontage<br>Road<br>Mountain View, CA 94043<br>(415) 960-0410<br>\$31.95 ©1984                                           | As a park ranger, you must pick up trash, save a swimmer, avoid snapping turtles, wrest food from voracious ants, and perform in the tradition of the park service. Enjoyable, colorful action game for ages 6+. | C 64 (d.). Joystick.                                                                                                                                                         | 1-year warranty.                                                      | ★<br>★           | ★<br>★           | ★<br>★<br>★      | ★<br>★<br>★      | E  | ★<br>★           |
| SEASTALKER<br>Infocom, Inc.<br>55 Wheeler St.<br>Cambridge, MA 02138<br>(617) 492-1031<br>\$39.95 ©1984                                                             | Intro-level text-only adventure takes you below the waves in a submarine to solve an underwater emergency. Simplified play system allows ages 9+ and newcomers the chance to play.                               | Reviewed on Apple II series, 48K (d.). Also for Macintosh; Atari Home Computers, 48K (d.); C 64 (d.); IBM PC/PCjr, 48K (d.); TRS-80 Model III, 48K (d.); TI-99/4A, 48K (d.). | 90-day warranty; \$5 fee thereafter or if user-damaged.               | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | N/A              | A  | ★<br>★<br>★      |
| SKYFOX<br>Electronic Arts<br>2755 Campus Drive<br>San Mateo, CA 94403<br>(415) 571-7171<br>\$40 ©1984                                                               | Use guided and heat-seeking weapons, and different types of radar to defend your home base. Riveting air-combat simulator features superb graphics. For ages 10+.                                                | Apple II series, 64K (d.). Version planned for C 64. Joystick.                                                                                                               | 90-day warranty; \$7.50 fee thereafter or if user-damaged.            | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | ★<br>★<br>★<br>★ | A  | ★<br>★<br>★<br>★ |
| SUMMER GAMES<br>Epyx, Inc.<br>1043 Kiel Court<br>Sunnyvale, CA 94089<br>(408) 745-0700<br>\$39.95 ©1984                                                             | Exciting, colorful, involving sports contest for 1-8 players. Compete in pole vault, diving, relay, dash, vault, javelin, and 1500-meter run in superior challenge for ages 10+.                                 | Reviewed on Atari Home Computers, 48K (d.). Also for Apple II series, 48K (d.); C 64 (d.). Joystick.                                                                         | 90-day warranty; \$5 fee thereafter or if user-damaged.               | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | A  | ★<br>★<br>★      |
| ZEPPELIN<br>Synapse Software<br>5221 Central Ave.<br>Richmond, CA 94804<br>(415) 527-7751<br>\$34.95 ©1983                                                          | Fly your zeppelin through a giant underground cavern, eliminating enemy balloons, zeps, barriers, laser gates, and buildings. Tough, but fun if you're patient. For ages 10+.                                    | Reviewed on C 64 (d. or cass.). Also for Atari Home Computers, 48K (d. and cass.). Joystick.                                                                                 | 90-day warranty; \$7 fee thereafter or if user-damaged.               | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | ★<br>★<br>★      | A  | ★<br>★<br>★      |

**RATINGS KEY** O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart; @ ★★ to ★★★★★, depending on price.



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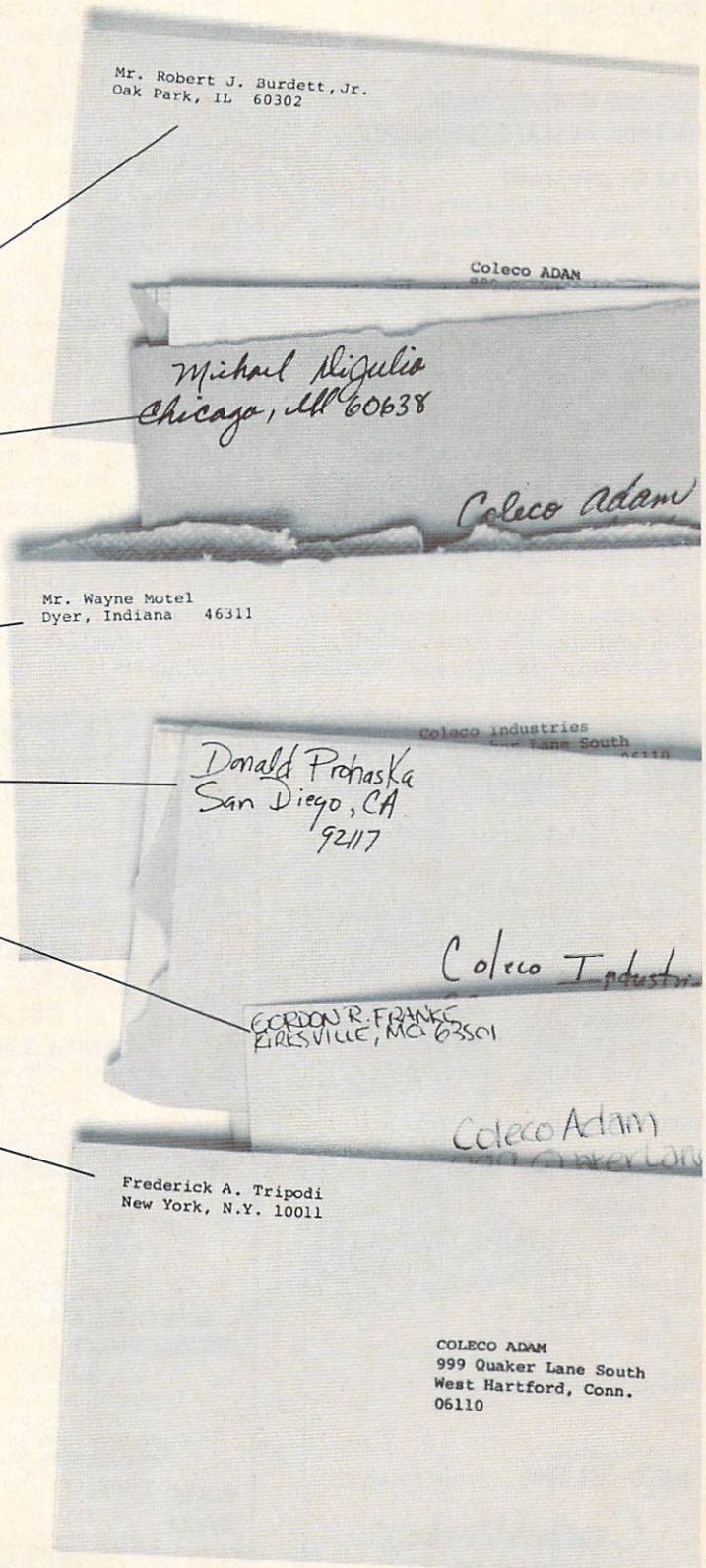
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## WHAT'S IN STORE SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 94 for information such as backup policies and addresses of software manufacturers.

### HOME BUSINESS/ HOME MANAGEMENT

#### Get Organized!

**HARDWARE REQUIREMENTS:** IBM PC/PCjr. RS-232 interface and modem for communications and auto-dial.  
**MANUFACTURER:** Electronic Arts  
**PRICE:** \$199.99

If you've been looking for a program to help you get your act together once and for all, *Get Organized!* might be it. This "integrated" (seven applications in one) program helps put your life in order, and you can do it much as you would without a computer—jumping between activities without losing your place.

There's a calendar on which to keep track of appointments, "to do" lists, and special events; an address book to store personal and business

addresses and phone numbers; index cards for filing data on anything from recipes to anticipated projects; and a powerful but easy-to-use word processor. In addition, you can interrupt your work at any point to use the keypad for quick calculations—or a notepad for jotting down ideas. Best of all, you can jump from one activity to the next and merge work from one application into another (except with results from the calculator portion of the program).

So far, I've used *Get Organized!* to write and organize my freelance assignments, to make sure I don't forget a birthday or a deadline, and to store ideas for future projects. By merging the address-book and word-processing applications, I could send letters to all our friends and relatives notifying them of our new address.

I've already found many uses for this program, and I haven't even tried the telecommunications features yet. This function enables you to use The Source, CompuServe, and other popular information services, without switching programs or restarting the computer.

This package doesn't provide the capabilities for doing complex finan-

cial calculations, creating budgets, or putting together massive reports, but everything else is there to organize your personal and professional activities. Thanks to the good manual and well-designed menus, I could use the program within an hour after I started it up. —LYNN TAETZSCH

#### Synfile+

**HARDWARE REQUIREMENTS:** Atari Home Computers.

**MANUFACTURER:** Synapse Software  
**PRICE:** \$79.95

Many people view the Atari computer as a game machine. Synapse's set of home- and small-business management programs will dispel that notion. *Synfile+*, a powerful data-base manager, is one of the Synapse series of business programs. You can use it with other *Syn* products (an electronic spreadsheet and graphics program) and with *AtariWriter*.

I found an immediate use for the program when I was promoted to first-line supervisor at work. I needed a personnel file of the people I'd be supervising. Besides the usual name, address, and phone number, I needed to keep track of vacations,

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## WHAT'S IN STORE SOFTWARE REVIEWS

personal time off, sick time, and tardiness. I also was able to include information about whether employees had attended the training courses they needed to pass in order to get a promotion. When my boss wanted a report on a certain employee, all I had to do was get the information from *Synfile+*. I then combined (or merged) this with *AtariWriter* for an impressive memo to my boss.

The file system is large enough to handle all personal home-filing tasks as well as a host of professional needs. In addition, its menu-driven format, with lists from which you select the functions you want to perform, makes it very easy to use.

—GLEN J. MCCARTNEY

## EDUCATION/ FUN LEARNING

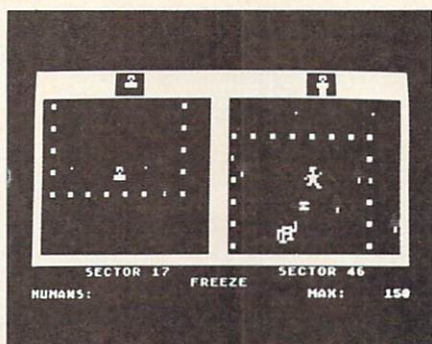
### Bannercatch

**HARDWARE REQUIREMENTS:** Commodore 64. Also for Apple II series, Atari Home Computers, IBM PC/PCjr. Joysticks.

**MANUFACTURER:** Scholastic Inc.

**PRICE:** \$29.95–\$39.95

It must be tough to turn a fast-mov-



ing field sport into an enjoyable educational game, but *Bannercatch*, Scholastic's two-player computerized version of Capture the Flag, proves it can be done, and done well. Each player controls two "humanoids" on the same team. Two opposing robots, with skills ranging from clunky to superhuman, become increasingly challenging as your expertise grows. Because you see only a small part of the gamefield at a time, you must keep track of your place using landmarks on the maps provided. The rules are simple: The first team to grab the opponent's flag and return to home territory with it wins. Players tagged while behind enemy lines stay in jail until freed by a teammate.

The robots use binary code to communicate with their boss, the mysterious "Max." This feature is educational and adds an element of intrigue as well. Players must translate the binary numbers into decimal numbers and match them with corresponding phrases (such as "WHERE IS OUR FLAG?" or "WHAT IS MY GOAL?") in the accompanying manual. By intercepting and decoding the robots' messages to one another, you can plan winning strategies. Players with no previous experience in using binary numbers can construct and use the *Bannercatch* decoder, which requires only addition.

Parents will appreciate *Bannercatch*'s emphasis on teamwork. It's hard to win when playing alone, so children usually pool their resources. Although it's intended for ages 9 and up, our 7-year-old, Howard, an enthusiastic joystick jockey, successfully takes on the robots as his older sister Cherry plans strategy.

*Bannercatch* lets you "freeze" the game whenever it gets too hectic—a good feature for kids who might find the frantic pace intimidating. Each win sends the score soaring and reveals a little more of a puzzle screen



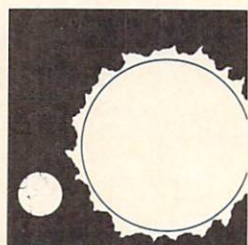
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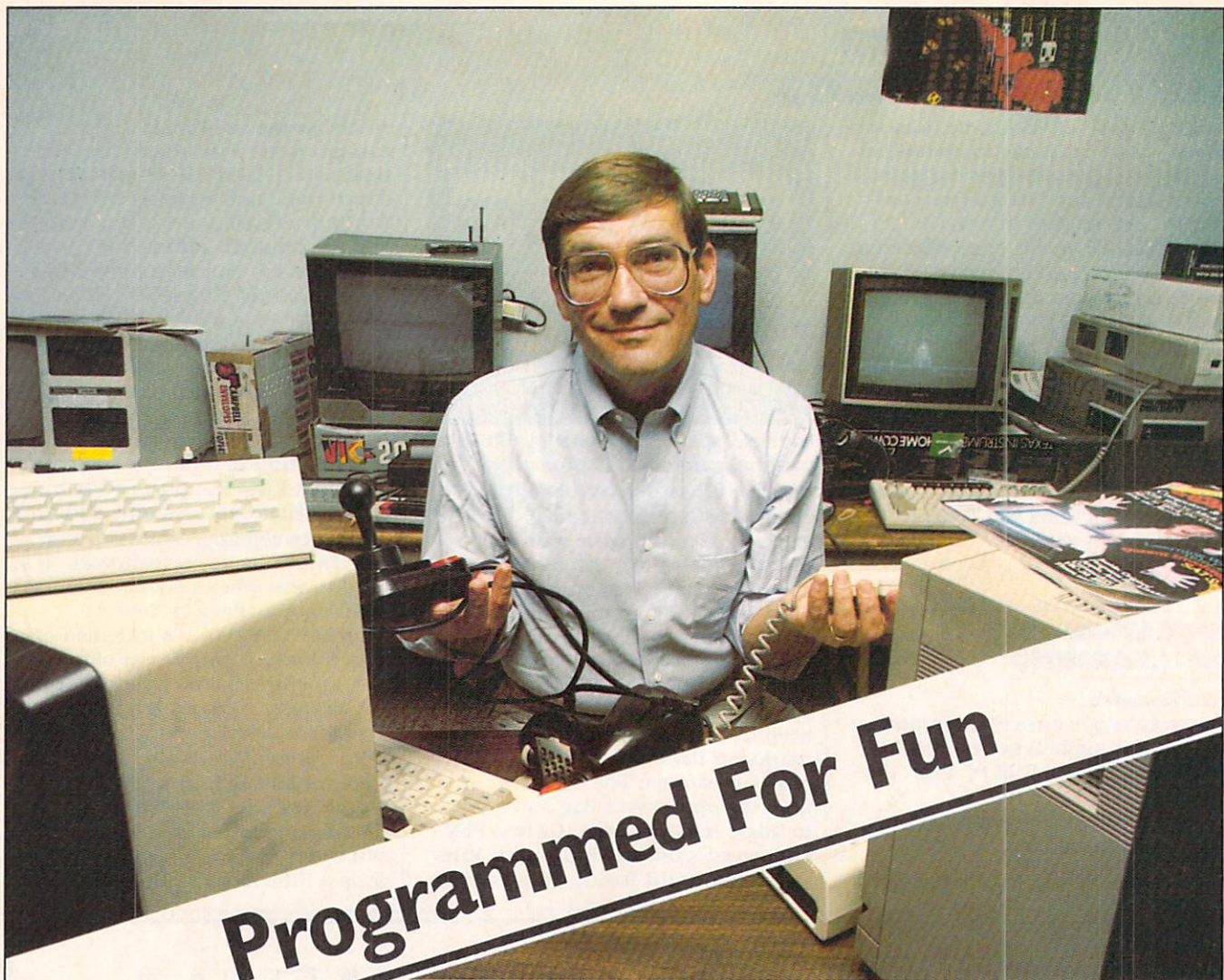
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## WHAT'S IN STORE SOFTWARE REVIEWS

that eventually displays robot-master Max's mysterious face.

*Bannercatch* lays the foundation for understanding different number systems. But it leaves more in-depth explanations and study to parents or teachers, or for more creative children to discover on their own. In fact, *Bannercatch's* best lesson may be the wonderful "Aha!" feeling that's a part of the discovery that occurs as you play it. —TAN A. SUMMERS

### Charlie Brown's ABC's

**HARDWARE REQUIREMENTS:** Apple II series. Also for Commodore 64.  
**MANUFACTURER:** Random House  
**PRICE:** \$39.95

Small children press keys and watch as Schulz's little people come to life—illustrating different letters of the alphabet. Kids press the arrow keys to progress forwards or backwards through the alphabet, or letter keys to select special letter screens.

Our 4-year-old, Jamie, prefers to press the letter keys, but has trouble remembering which ones are on which side of the disk (A-M are on side 1; N-Z on side 2). Taping an alphabet strip to the monitor with a line separating the two halves of the alphabet might help.

Some of the graphics are so busy that younger children lose their sense of the letter. Accompanying activity cards can help in determining just what word it is that starts with the letter in question. (Jamie thought we were watching "K" for "KICK," until we discovered it was "F" for FOOTBALL.) The children I played with soon learned all the screens and selected them repeatedly watching the pictures come to life.

The users' guide contains over a dozen games and activities that parents and children can play together. Parents who play these games with their children are bound to see some exciting learning taking place.

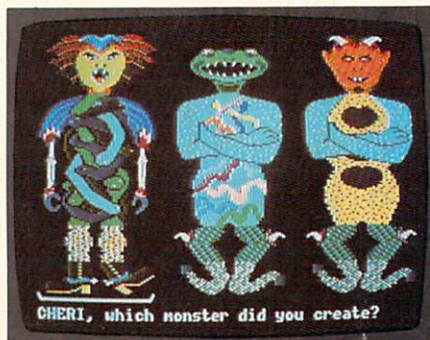
—MARLENE ANNE BUMGARDNER

### The Incredible Laboratory

**HARDWARE REQUIREMENTS:** Apple II series. Also for Atari Home Computers, Commodore 64. Color TV or monitor recommended.

**MANUFACTURER:** Sunburst Communications  
**PRICE:** \$55

"Red dust causes an orange face and blue hair, and goose grease causes green snakey legs. I'll bet if we substitute black ice for goose



grease we'll get purple legs."

Fortunately, this conversation took place over a game of *The Incredible Laboratory*, not in the operating room at the Hospital! Red dust and goose grease are just two of the "chemicals" you can use in *The Incredible Laboratory* to create a variety of monsters. Your task is to figure out which combination of ingredients results in which features. To do this, you create a monster (keeping careful records of the ingredients you use) and then vary one or more chemicals to observe the change. By performing a sequence of such experiments, eventually you can deduce how different ingredients affect the monster's appearance.

A novice level gets you started. The written documentation provides excellent hints on various strategies to solve the problems effectively. You can move on to the apprentice level, in which you have more chemicals to choose from. At this level a combination of two chemicals creates entirely different features from the use of either chemical alone! Fortunately, every time you play the game at either the novice or apprentice level, the same chemicals produce the same features on the monsters, so there's lots of opportunity to learn the links. At the scientist level, however, the chemicals cause different features to appear each time you play. You'll have to start from scratch every time you restart the program. By imposing a time limit for experimenting, or limiting the number of experiments you are allowed to conduct, you can make the game as challenging as you wish!

Our kids especially liked the graphics and the sound effects. The beaker bubbles and changes color as you add ingredients, and, when your mixture is finished, the laboratory fills with smoke before the monster appears. The smoke takes too long to fill the screen, and some players grew restless after a while. Also, er-



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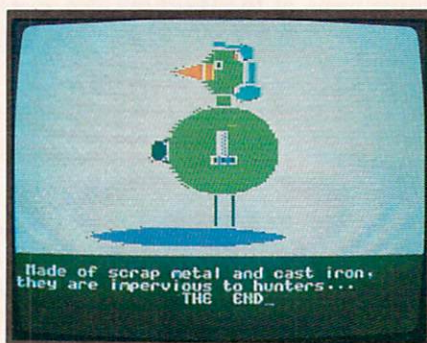
rors cannot be corrected. For example, a typing error in selecting chemicals or typing your name is irreversible. And, once you've elected to play at a given level, you can't escape to the menu—you must complete the experiment. In software intended for children, it's critical (and simple) to include features to avoid such problems. —TONY MORRIS

### Story Maker

**HARDWARE REQUIREMENTS:** Apple II series. Also for Commodore 64, IBM PC/PCjr.

**MANUFACTURER:** Sierra Inc.

**PRICE:** \$34.95



This unique introduction to creative writing, intended for children ages 7–14, is a simple word processor that allows you to type in a story, edit it, and save it on a disk. *Story Maker* also allows you to illustrate your story, inserting pictures into your creation wherever you wish.

This unusual combination of text and graphics makes *Story Maker* useful for all kinds of fun projects: Create a journal of a trip, including drawings of sights seen, or use it to write an illustrated letter and send it to someone on disk with a comparable computer and program.

The written documentation primarily discusses creative-writing techniques. Younger users won't understand such concepts as continuity, clichés, metaphors, and similes, but our older children find it valuable and informative.

A card summarizes all major commands but, unfortunately, the instructions for using the word processor are contained on the disk itself. The graphics program instructions are similarly unhelpful. Features such as selecting colors and coloring in spaces must be learned by trial and error. Younger users will require adult assistance and lots of patience in learning how to create and illustrate.

Also, error-handling is unusually

weak for software intended for children as young as 7. To correct a typing error, for example, you can't simply hit the left arrow key; that backs you up but doesn't erase. You must position the cursor under the error and press CTRL-E. To correct a graphics mistake, you undo the last portion you drew of the picture and start over. The "undo" key ("U") is right next to the "I" key that moves the cursor up. This results in frequent accidental "undoing," especially with young users.

You must have a blank story disk for each new story or writing project (one is provided with the software, for starters). With several children and several writing projects, this can really add up.

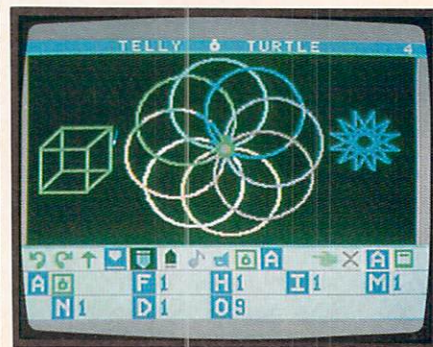
In spite of these weaknesses and the fact that the word processor and graphics program were fairly primitive compared to others they've used, our kids found *Story Maker* fun and educational. —TONY MORRIS

### Telly Turtle

**HARDWARE REQUIREMENTS:** Coleco ADAM. Also for Atari Home Computers, Commodore 64. Joystick.

**MANUFACTURER:** Coleco (Atari and Commodore versions for \$29 from Hayden Software)

**PRICE:** \$24



An introduction to programming intended for 5- to 15-year-olds, *Telly Turtle* uses graphics symbols (icons) to represent commands; step-by-step lessons; and of course, Telly the turtle. Children can painlessly learn the basics of Logo-like programming using Telly to create colorful graphics.

Even though my 5-year-old, Melissa, can't read or write yet, she was able to catch on by using the combination of joystick and icons (or symbols). The instruction manual helped me introduce her to each command through example. It only took one session together before Melissa grew comfortable with the icons and their corresponding func-



tions. She seemed at ease when I encouraged her to explore on her own. I acted as an interested observer, there to help out when she was in need or when she was ready for a greater challenge.

She ran into some difficulty when moving Telly distances of more than 20 "steps." Melissa hasn't yet learned to recognize numbers greater than 20, and the dimensions of the boxes she first drew never exceeded this magic value. She soon discovered, however, that by repeating the command she could draw larger boxes.

Although Melissa's experience to date has been with the first two levels, older children will find more challenge in creating their programs and subroutines in levels three and four. Whether the program will appeal to children at the upper reaches of the 5-15 age group is questionable, however. *Telly Turtle* is an effective teaching tool for first-time "programmers" and is graphically entertaining at the same time.

—KENT A. DAVENPORT

## GAMES

### Jupiter Mission 1999

**HARDWARE REQUIREMENTS:** Atari Home Computers. Version planned for Commodore 64. Joystick.  
**MANUFACTURER:** Avalon Hill  
**PRICE:** \$50

Ever wonder what it's like to wake up from a peaceful sleep, several years and many millions of miles away from Earth, only to find yourself in sole command of a gigantic spaceship headed towards the planet Jupiter? Welcome to *Jupiter Mission 1999*, a game that seems to have been influenced by the astronauts' predicament in *2001: A Space Odyssey*.

You're just an average end-of-the-20th-century scientist, brought along to help determine why intelligent radio signals keep emanating from Jupiter. It isn't your duty to know how to navigate a starship, much less repair, defend, and use its instruments, space probes, and robots. But when you're unceremoniously awakened by the news that the rest of the crew is dead and that only you are left to defend the ship from an asteroid storm, you have little choice but to learn new skills with amazing speed.

This is a challenging, though

somewhat under-documented, role-playing arcade/adventure game. Not only must you draw upon considerable talents in shooting, timing, steering, and other arcade challenges, but you have to figure out the proper mission of your ship, *The Space Beagle*, as you proceed. It's fun to do, but as the instructions lack full descriptions of the stages of your mission, there's a lot of trial and error involved. Be sure to save the game every time you successfully complete a task before going on.



Like other games which are likely to follow, *Jupiter Mission 1999* is a great advance on traditional one-play-only arcade games. By combining several arcade programs into a "plot," players get the thrill of success without the frustrations of having nothing else to do once they've finished blasting asteroids or managed to pilot a vehicle to a soft landing. This is the tip of a very big iceberg. Join up now for *Jupiter Mission 1999*, suitable for ages 12 and up. I'm looking forward to the sequel, *Quest of the Space Beagle*, a two-disk game for Atari Home Computers.

### Mr. Robot and His Robot Factory

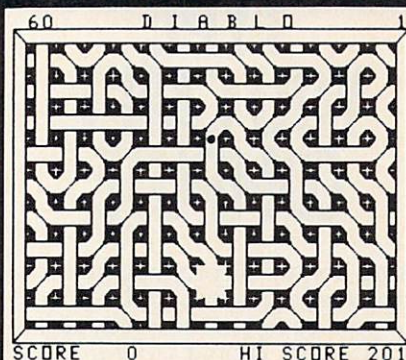
**HARDWARE REQUIREMENTS:** Apple II series. Also for Atari Home Computers, Commodore 64. Joystick.  
**MANUFACTURER:** Datamost  
**PRICE:** \$34.95

The straightforward arcade action of this game is not that great—it's on a par with dozens of others on the market. But *Mr. Robot and His Robot Factory* has a build-it-yourself program that turns an ordinary evening into tremendous fun for the whole family.

Choose from a selection of existing screens, or build your own from scratch. The thrill of discovery as you "test" each new trap doesn't diminish over time. Playtesters sat for hours, carefully crafting screens, re-

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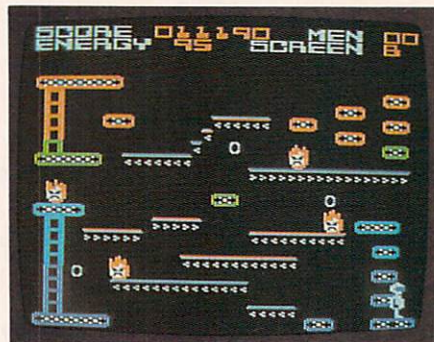
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## WHAT'S IN STORE SOFTWARE REVIEWS



vising them to get the bugs out, testing them by having others play, and finally saving them on disk for future use.

It reminds me of the days when, as kids, my brother and I used to create huge Lionel train setups in our house. Parents will delight as their kids' faces light up with pride in their accomplishments.

You have a variety of elements from which to choose in creating screens: poles to slide up, escalators to move down, ladders to climb up or down on, magnets to pull Mr. Robot along, treadmills which move right or left, "transporters" to switch him from one place on the screen to another, trampolines on which to bounce, enemy "alienfires" to chase Mr. Robot across the screen, energizer tokens to defeat the alienfires, and that favorite among playtesters, "bombs," pedestals upon which you can step, walk, or run, but which explode seconds later. Altogether quite a game, and one which even children younger than 10 can play with parental supervision.

### Legionnaire

HARDWARE REQUIREMENTS: Atari Home Computers. Also for Apple II series, Commodore 64. Joystick.

MANUFACTURER: Avalon Hill

PRICE: \$25-\$40

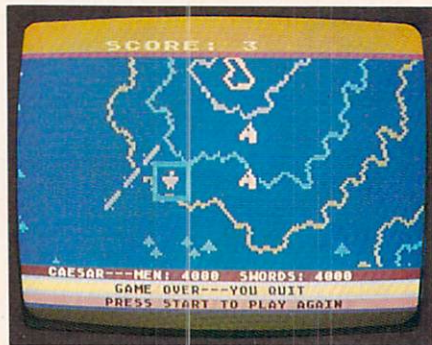
Anyone who took Latin in high school has read Caesar's *Gallic Wars*. But how many of us have lived through them? Well here's your opportunity. Boot up *Legionnaire* and transport yourself back to 58 B.C. You're in command of a Roman Legion, or two, or even 10—the full strength of Julius Caesar's expeditionary force for the conquest of Gaul (later known as France).

This war game simulates ancient warfare in a novel way: Everything happens simultaneously. Both you, as the Romans, and the computer, as one or more Gallic tribes, are

moving and fighting at the same time. This gives you little time to think (unless you pause the game, which is recommended for beginners), but re-creates the pressures of decision-making under fire.

Each of your units is given an attack and defense strength, speed, steadiness under fire, morale level, and tendency to retreat. The Gauls have set "quantities" for leadership, speed, attack and defense capabilities, discipline, and size. What's more, the game is designed so that novices can start small, using one or more Roman units against the weaker "barbarians." Then, as you gain confidence and tactical skill, you can increase the size of your army and the number and skill level of your opponents.

*Legionnaire's* play system is easy to use, for it employs the joystick to set and carry out movement and combat options. This system (unusual in war games) makes the game move right along; it's a lot less cumbersome than the keyboard system used in most computerized military simulations.



The documentation provided with the game is outstanding. It goes beyond mere rules to profile each legion and tribe in the program, give a historical background to the game, and offer extensive tactical hints. Both a fine introductory lesson in war-gaming for newcomers and a different "beer and pretzels" experience for old hands, it's fast-moving, quickly played (from as little as 15 minutes a game!) entertainment, suitable for ages 12 and up.

### SkyFox

HARDWARE REQUIREMENTS: Apple II series. Planned for Commodore 64.

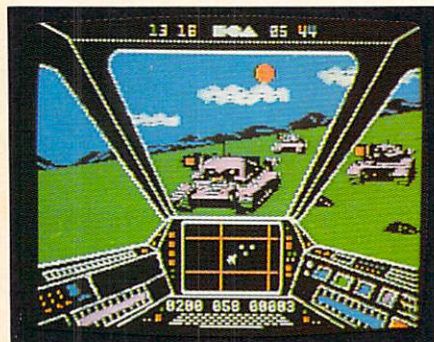
MANUFACTURER: Electronic Arts

PRICE: \$40

SubLogic's *Flight Simulator* can't be beat as the best simulation of flying a small plane. But its graphics,



while interesting, aren't great. Other flying games have come along and improved on the graphics, but none has come close in duplicating the "feel" of flight until *SkyFox*.



This game puts you in the cockpit of a supersophisticated jet fighter, armed with heat-seeking and guided missiles, and laser cannon. Its multipurpose radar systems allow you to look down, ahead, and all around the craft, and its shields provide some measure of protection from enemy fire.

Your job is to protect the home base, the only place you can repair as well as rearm and refuel your plane. To do this effectively, you learn to pilot your craft at high speeds over land (as low as a few feet off the ground at 1200 m.p.h.—quite a rush) and at high altitudes, where you can reach speeds of Mach IV (four times the speed of sound). If you have "the right stuff" you can advance from subduing small numbers of tanks or planes to handling massive fleets of tanks, planes, and even spaceships!

This game's variety of special graphic displays, many of which zoom into closeup at your command, and the incredibly detailed through-the-cockpit windshield views give this the best state-of-the-art flying graphics today. The flight-control system, though not nearly as sophisticated as *Flight Simulator's*, rivals the *Mig Alley Ace*, *Spitfire Ace*, and *Solo Flight* simulators from MicroProse Software, which is saying a lot. Were I looking to buy just one program, I'd choose this over any other flying game.

One can fly at different skill levels on "missions," and although children younger than 12 may need parental supervision at first, they'll pick up even the more complex single-key commands after playing for awhile. Electronic Arts has done it again!

—REVIEWS BY JAMES DELSON

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# THE PRIMER

The Primer is a regular department of FAMILY COMPUTING, though the information presented changes from time to time. It is a handy reference guide that briefly explains the basic words and concepts you'll encounter when using a computer.

The only way to learn to use a computer is to use one. But before you start, it's well worth asking, "What can I do with a computer?" And, "How does a computer work?"

The illustration of a computer system on the following page shows various pieces of equipment, referred to as hardware. To work effectively, this hardware needs step-by-step instructions, or programs. These programs are often called software. What you can do with a computer depends on the software you use.

The many uses of home computers can be broken down into several broad categories.

## WHAT A COMPUTER DOES

**Game Playing.** Several types of games are available—arcade-style action, fantasy, adventure. Some take minutes to master; others months. Many games can be played by more than one person at a time.

**Education.** Whether you are learning math, French, history, or typing, these programs allow you to learn at your own pace. Programs range from question-and-answer drills to loose creative exercises. Some test logical skills by putting you in a real-life problem-solving situation; others teach you to program by letting you draw pictures.

**Paperwork.** When it comes to handling reams of information, the computer can't be beat. It functions as an endless supply of paper, file cabinets, and a calculator rolled into one. With an electronic spreadsheet, you can change one figure in a budget and the rest will automatically change. The ability to ask "What if?" and see immediate results has obvious time-saving benefits.

The computer is equally adept at setting up a filing system, and allows you to cross-reference data in any number of ways for easy recall.

With a word-processing program, the computer can speed up and simplify the writing process by allowing you to change or rearrange words and paragraphs without retyping.

**Communications.** You can connect your computer, via the tele-

phone, to much larger computers at "information service" companies.

When connected (for an hourly usage fee), you can "call up" stock quotations, airline schedules, newspaper or magazine bibliographies, and get the latest news relating to your particular computer. You can also leave or receive messages for other subscribers, a practice called "electronic mail."

In addition, you can connect your computer to individual computers around the country. You can chat with friends, exchange programs, or call up local "bulletin boards." They are considerably smaller than information services, usually run out of someone's house, and specialize in one topic only.

**Programming.** It's possible to enjoy practical benefits from your computer without ever buying a commercial program—you can write your own. And, in some cases, you can adapt commercial programs to better suit your practical needs.

## HOW A COMPUTER WORKS

The computer is an information-handling machine. It stores, compares, changes, and manipulates information of almost any kind at tremendously high speeds.

The computer's operating method can be boiled down to four simple steps. (1) **INPUT:** Instructions and information, in the form of a program and data, are entered into the computer. (2) **PROCESSING:** The computer executes the steps of the program. (3) **OUTPUT:** The results of the computer's work are made visible and available to the user. (4) **STORAGE:** Results can be stored and saved.

Most home computers do not come ready-made in one piece, but must be assembled from various components. Following are the components needed for each of the four operating steps, and how they work.

**Input.** There are four basic ways of getting a program and/or other information into a home computer.

**KEYBOARD.** The keyboard looks and behaves much like that of a typewriter. Some keyboards have special

keys for certain computer functions, and some have a numeric keypad, much like a calculator. But on any unit, every keystroke you type goes directly into the computer's memory. That information will stay there until you delete it or turn the computer off. (You can also store, or save, that information for future use.)

**CASSETTE TAPE RECORDER.** You can copy a program stored on a cassette tape directly into the computer's memory. Regular tape recorders and cassettes can be used with most home computers, although you will need a special cable to connect the two. Once connected, you merely type a simple command to transfer the program from tape to computer.

**DISK DRIVE.** The transfer method is much the same with a disk drive, except that the program is stored on a floppy disk, which looks much like a 45 rpm record.

The disk drive enters programs much more quickly and with less chance of error than the cassette recorder. But the cassette recorder is significantly cheaper.

**CARTRIDGE.** A cartridge, which plugs into a slot built into some computers, also stores programs. Putting a cartridge into a computer actually adds memory to the computer—and that memory contains a program.

**Processing.** All input goes to the Central Processing Unit (CPU). The CPU, a tiny maze of electronic circuits, is most often located underneath the keyboard. However, in some computers it's contained in a separate system unit.

The CPU controls the flow of information into, out of, and inside the computer. The computer's memory, where information is stored, is located in the CPU. The CPU also interprets a program, performs each of its steps, and then sends the results to the user.

**Output.** The visible result of a CPU's work is called output. Output is made available on the screen of a TV or monitor, or from a printer.

See the accompanying illustration to find out how these components



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are connected to the computer.

**Storage.** When the computer is turned on, it will store and remember all information it receives. But when it is turned off, this information will vanish—unless you instruct the computer to save it.

You can store information on a blank tape or disk. Either way, you can record the results of the computer's work, just as you would record a speech. Then, any time you want to run that program again, you

can transfer it into the computer's memory, and see it on the display screen.

You cannot store new information on a cartridge.

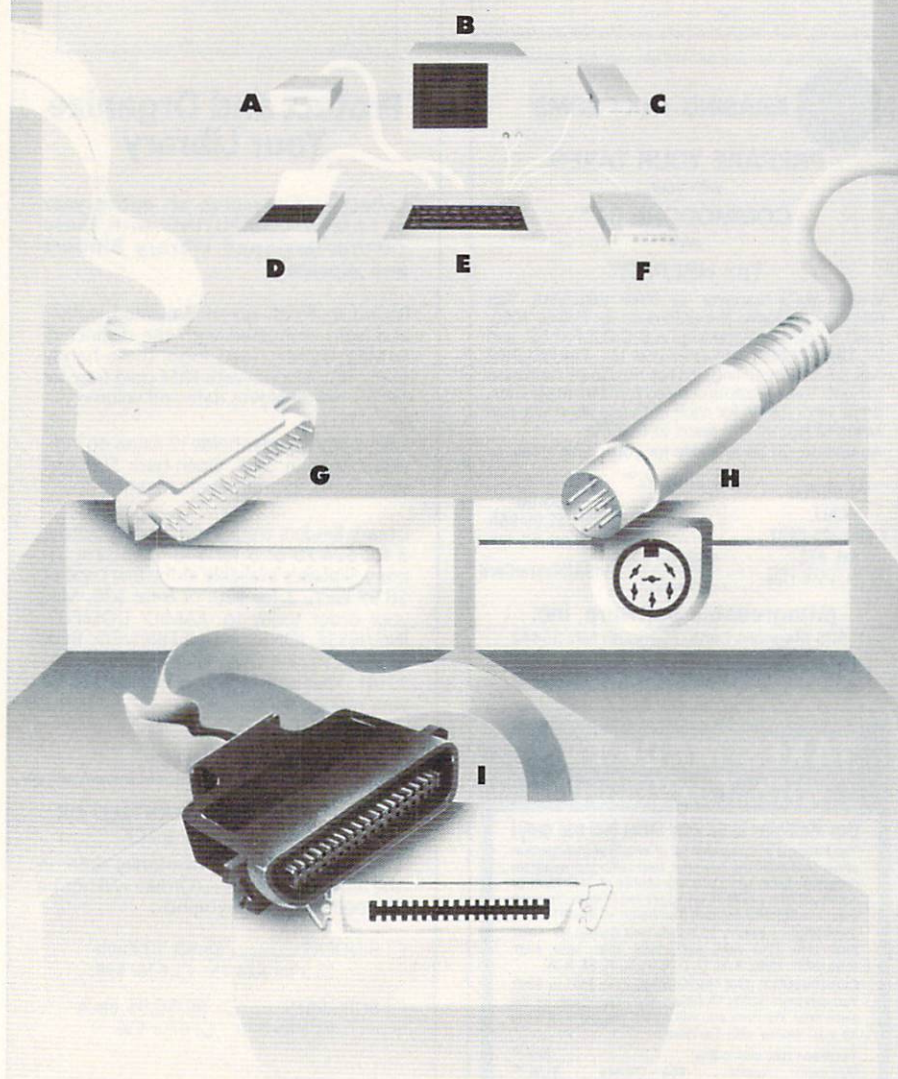
**Peripherals.** Peripherals are optional pieces of equipment that can be added to your computer, but are not crucial to the computer's operation. A printer, in fact, is considered a peripheral. One of the most popular peripherals is a modem.

**MODEM.** If you want to link your

computer to an information service or to another computer by phone, you will need a modem. A modem either holds a telephone receiver or a modular telephone jack, and can send and receive data through the phone lines.

Remember that the computer is a tool. As with all tools and machines, there is no need to know everything about how a computer works. All you need to know is how to use it for your own purposes.

## THE COMPONENTS & CONNECTIONS



**A. Disk Drive.** Disk drives sold for a particular computer brand generally come with the proper connecting cable.

**B. Monitor/TV.** Often a round DIN connector hooks into the computer; a cable with audio/video jacks hooks into the monitor. Sometimes

a simple video cable, with one jack at each end, is used (no sound output). To connect a TV to a computer, you'll need an RF modulator, which is standard equipment with most computers.

**C. Cassette.** The interface is often a cable with two jacks (or three)

at each end: one for saving a program to tape, and one for loading a program into the computer. Sometimes the computer end of the cable is a round DIN connector. And, for Ataris and Commodores, the cassette end of the cable is hard-wired into the cassette player.

**D. Printer.** The most common printer connection is the Centronics-type parallel interface, though RS-232C interfaces are usually an option. Apple's Macintosh uses a high-speed serial port. Atari and Commodore computers require special cables. Apple II and IBM PC require internal circuit boards. IBM PCjr requires a parallel printer attachment.

**E. Computer.** A computer's ports, where cables are connected, can be on the back, side, front, or even the bottom of the unit. Note: sometimes the keyboard unit is separate from the Central Processing Unit (CPU), or system unit.

**F. Modem.** Most external modems are connected with an RS-232C serial cable. Slight wiring modifications are sometimes required. Internal modems, available for Apple and IBM, are circuit boards that go into slots inside the computer; no connecting device is necessary.

**G. DB Connector.** Used to connect printers, modems, and even joysticks, the DB connector has between nine and 25 pins. The classic RS-232C serial interface, shown here, has 25 pins, with each pin leading to a wire inside the cable.

**H. Round DIN Connector.** Round DIN connectors plug into the computer's serial port (for modems and printers), or they are used as one end of a monitor cable. One-, five-, six-, and eight-pin configurations are used.

**I. Centronics Parallel Interface.** The most common parallel interface is the Centronics connector, which is used to connect printers. The 36 "pins" do not protrude, but lie flat against a plastic center ridge.

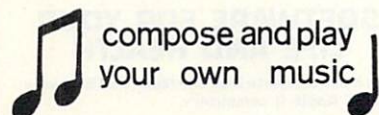


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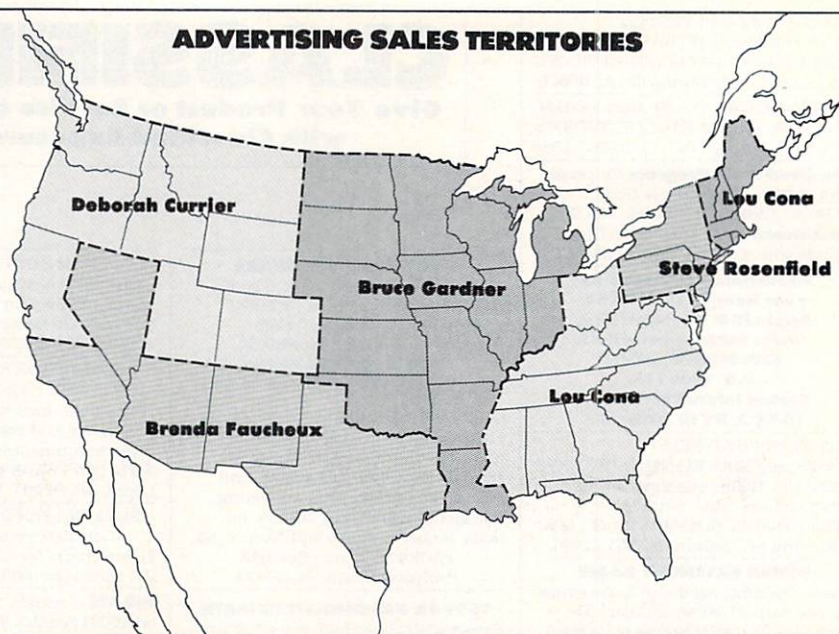
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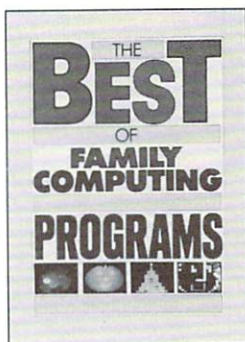
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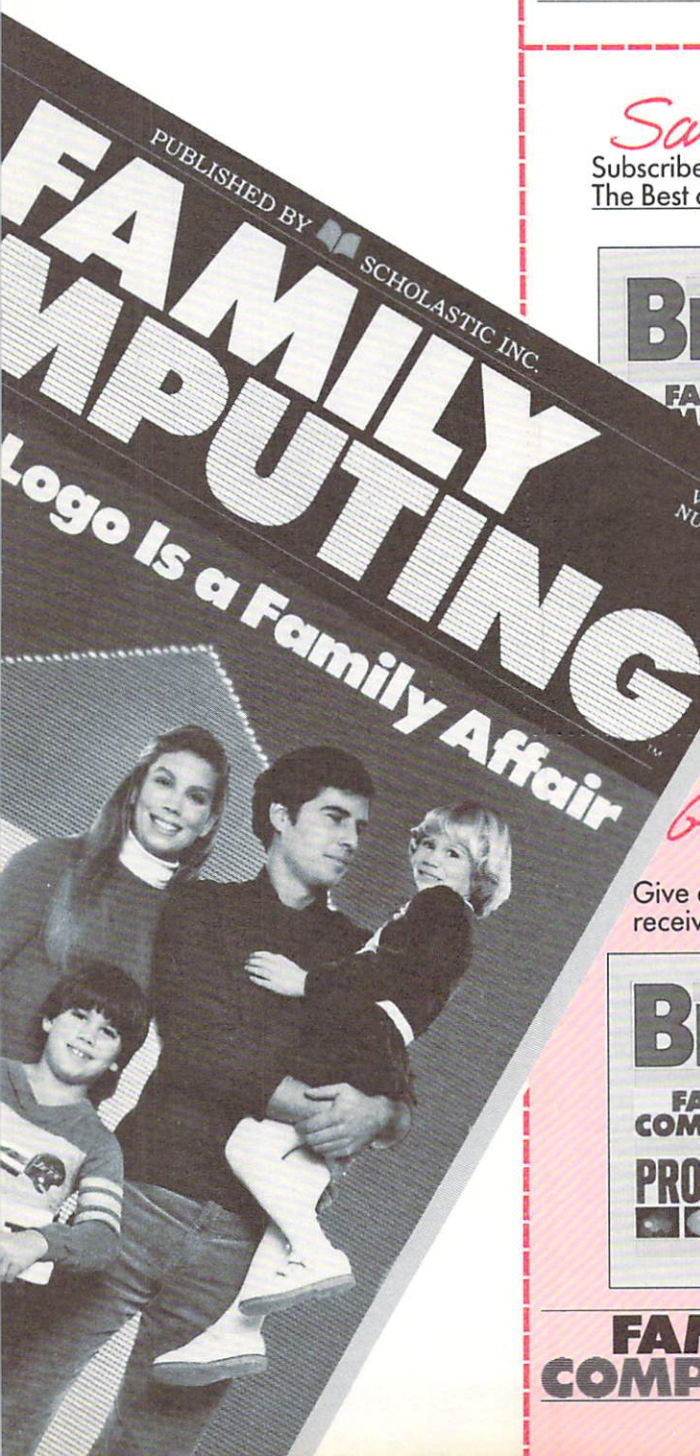
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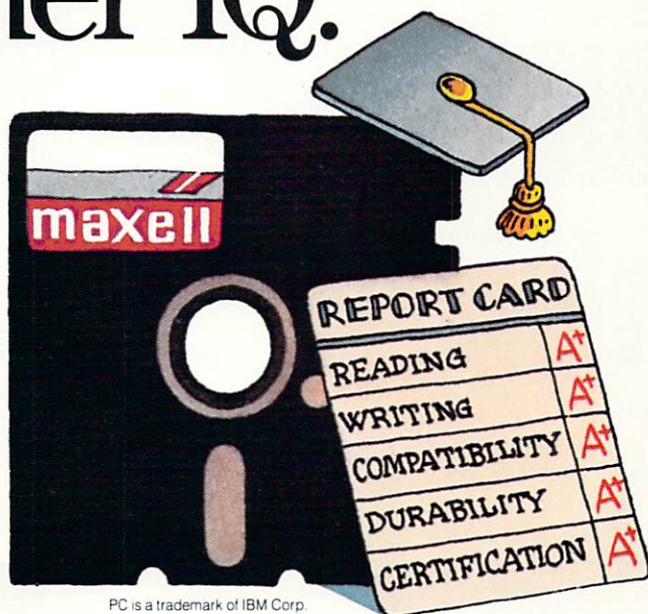


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