

TAXES
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VOLUME 3
NUMBER 3

FAMILY COMPUTING

Telecomputing:

The New Wave in
Communications

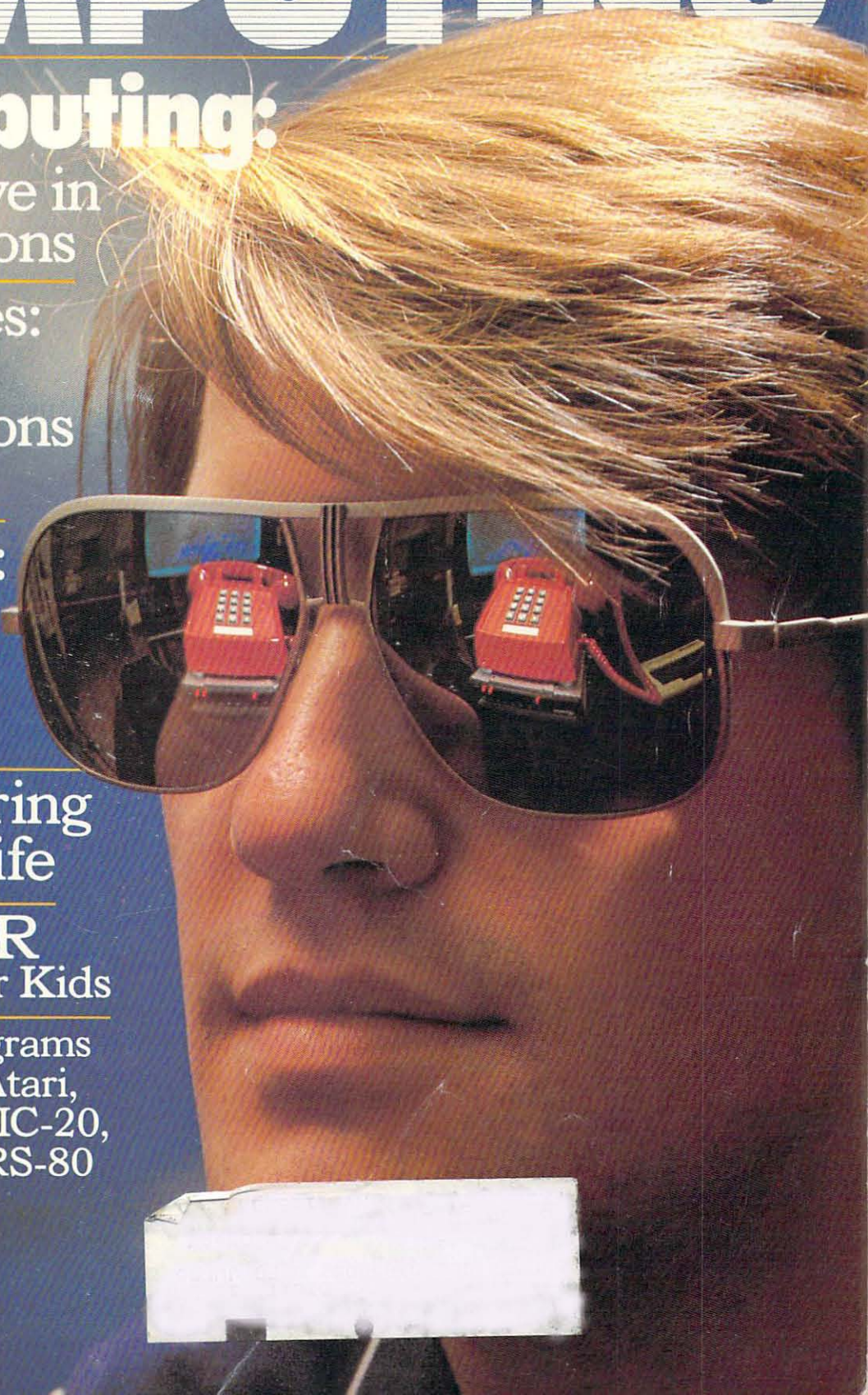
Buyer's Guides:
Modems and
Communications
Software

Helpful Hints:
Get the Most
From Your
Computer

Software to Bring
Learning to Life

Plus: **K-POWER**
Mini-Magazine for Kids

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



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n single sheets, computer
overhead projection.

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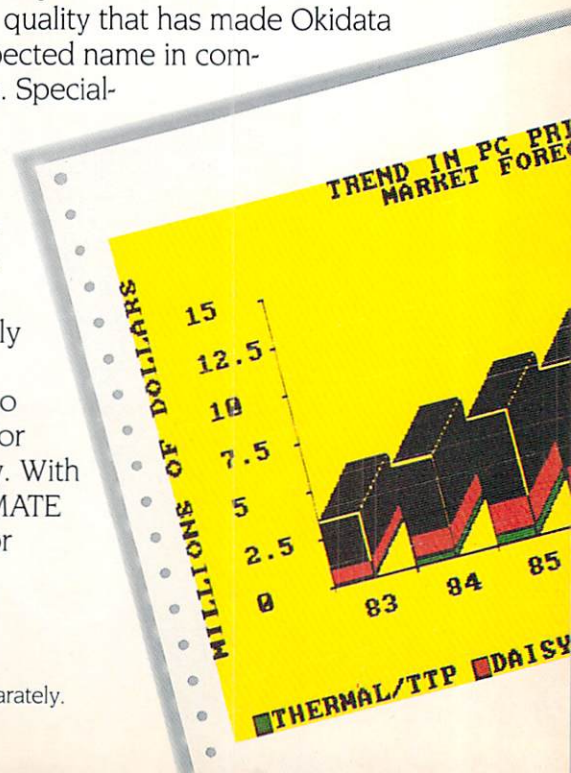
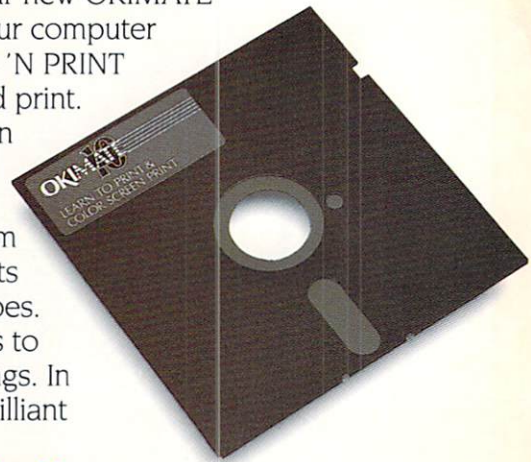
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The OKIMATE 20.

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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.

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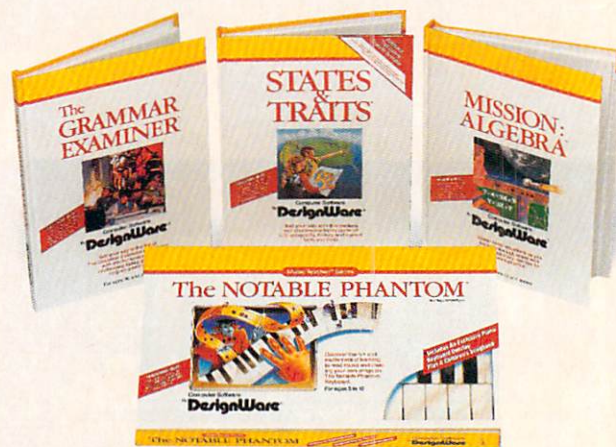
MISSION: ALGEBRA™ (ages 13 to 18) generates thousands of equations. Solving each group of equations helps rescue a stricken space ship. The computer instantly checks each step in your solution, no matter what approach you use, and can coach you when you run into trouble.

THE NOTABLE PHANTOM™ (ages 5 to 10) transforms your computer keyboard into a musical keyboard to teach reading music, ear training, songs and simple composition. Includes a plastic keyboard overlay.

HELP IS AT HAND

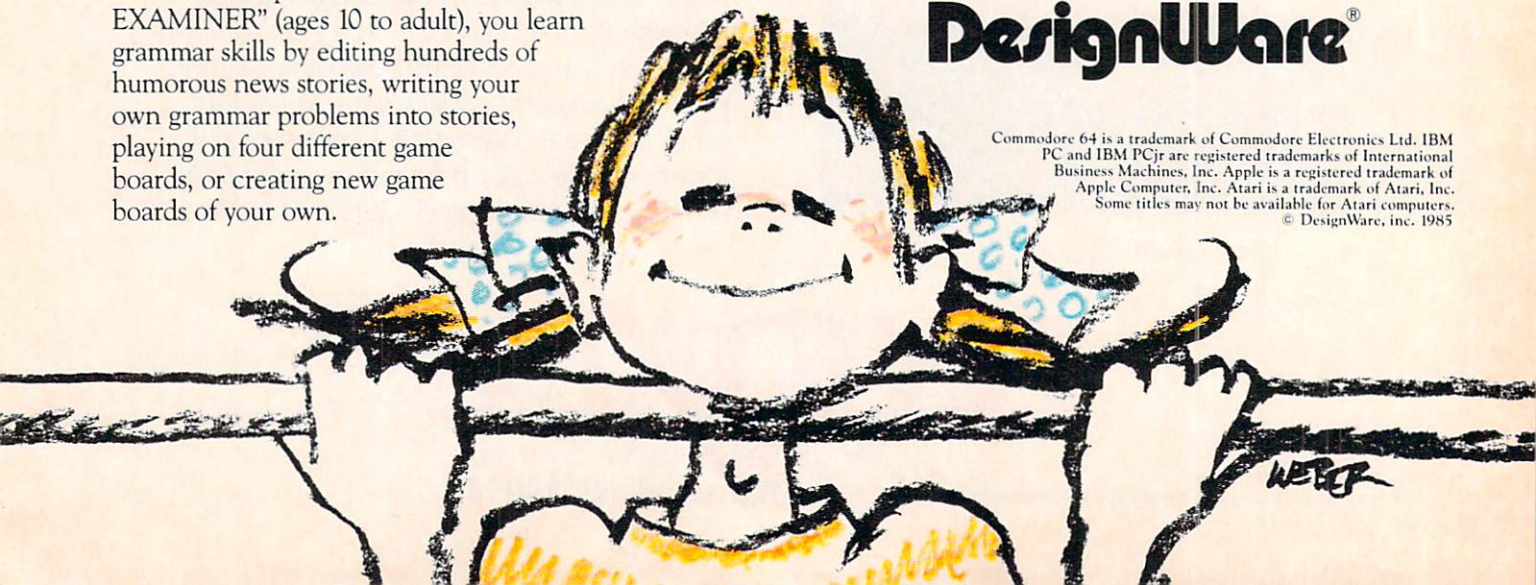
DesignWare family learning games are available at all major software retailers, and run on Apple II family, IBM PC, PCjr, Commodore 64, Atari and other popular microcomputers with disk drives. We provide a 90-day warranty against defects and free telephone support.

Our latest releases come in easy-to-preview, easy-to-read hardcover books, which also provide permanent disk storage. Visit your local software retailer or write for our free catalog. DesignWare, Inc., Department MC, 185 Berry Street, San Francisco, CA. 94107.



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by Mindy Pantiel and Becky Petersen

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COVER PHOTOGRAPH BY LANGDON CLAY



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EDITOR'S NOTE

THE HUMAN CONNECTION

Several commentators on the computer industry are betting on the modem. Linking up the computer and telephone, allowing anyone access to an endless variety of services and data, will, they say, lead to widespread use of computers at home.

Most coverage of modems and telecomputing has centered on these services. And that's the way it should be. But what's missing from these stories is the human connection.

Linking oneself to other people via computer, modem, and telephone is an appealing and popular activity. The form of companionship provided this way, and the exchange of ideas, are not to be minimized. But there are some particularly noteworthy connections being made that deserve special attention.

I'm most impressed with the way the computer serves as a great equalizer. A few years ago I heard about an electronic relationship that produced important information for a research project. The exchange between the two participants in the conversation took a fateful turn when one identified himself as a professor of computer science and then asked his "friend" what he did. I AM A SIXTH-GRADE STUDENT came the reply. That ended the communication between the two, both of whom were stunned by the revelations.

The anonymity afforded by the computer had allowed the professor to ask his questions without being prejudiced by the physical characteristics of his electronic friend; it allowed the 12-year-old to answer without diffidence or intimidation.

Just the other day I read the transcript of an electronic conference we conducted over the CompuServe electronic edition of FAMILY COMPUTING. It was with best-selling author Peter McWilliams on the subject of computers and the handicapped—the preferred term of the conference's participants. (McWilliams' latest book is *Personal Computers*



and the Disabled, Quantum/Doubleday, 1984, \$9.95.) Two of the most active participants in the conference eventually identified themselves as handicapped—one without sight or speech, the other without sight or hearing.

This brought to mind the mail we get from handicapped people or the parents of handicapped children, outlining the ways in which the computer has changed their lives.

All of these stories demonstrate one of the most basic functions of the computer—it is an extension of ourselves.

Our cover story (page 25) outlines just what telecomputing can do for you, and tells you just what you'll need to start reaching out.

Claudia Cohl

CLAUDIA COHL
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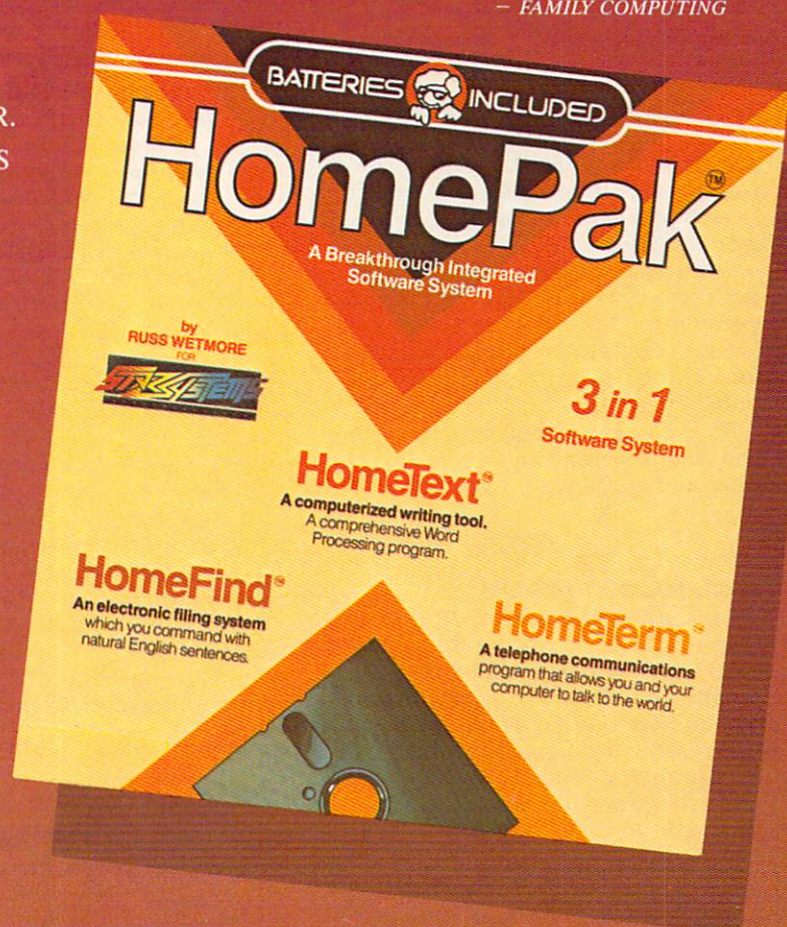
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- to help you, system status is displayed right on the screen

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LETTERS

THE BEST OF THE BUNCH

I wanted you to know how excited I am about my subscription to FAMILY COMPUTING magazine. I recently bought my family a Coleco ADAM computer and your magazine complements it quite nicely. In all, I subscribe to 15 magazines a month, however, I don't know why I need the other 14. Yours is all I need! Thanks.

LARRY WOLFERSBERGER
Shelby, Ohio

EDITOR'S NOTE: Thanks for your words of praise. We were sorry to hear Coleco Industries announce in January that it would discontinue manufacturing the ADAM. For the foreseeable future, FAMILY COMPUTING will continue to support ADAM owners by publishing reviews of ADAM products and original programs for the machine.

A HIS-AND-HERS MAGAZINE

We love your magazine. Mrs. Frei especially looks forward to typing in your various programs every month. I enjoy your surveys covering equipment and software.

What prompts me to write this letter, though, is your *Mailing List* program in the November 1984 issue. Let me congratulate Brent Friedman for writing the program and you for publishing it.

Mrs. Frei is a school secretary, and she will use your program for her class and staff lists.

JACK E. FREI
Freeport, New York

A CLOSED WINDOW

After reading a review of *Window* in your magazine, I wrote to the company for information and subsequently ordered a one-year subscription to *Window*. I only received one issue of the five I paid for, and they do not answer my inquiries.

Do you know if the company has moved or gone out of business?

ELAINE ROTH
Peoria, Illinois

EDITOR'S NOTE: We're sorry you've had such trouble getting through to the makers of *Window*. We've also had difficulty reaching *Window, Inc.* for the past several months. Apparently, the company has gone out of business. For information on how to go about getting a subscription refund, you might try contacting the Better Business Bureau in Boston at (617) 482-9151.

CREDIT WHERE DUE

I am responding to a good article which appeared in your November 1984 issue, entitled "Software to Challenge Your Children."

Mentioned under the "Simulations" heading was a program called *Lemonade*, which is credited to Apple Computer, Inc. *Lemonade* is a MECC-copyrighted program that was licensed to Apple for inclusion on its master disk. Although copyrighted in 1980, it continues to be a very popular MECC product. For your information, *SELL LEMONADE* can be found on the MECC Elementary Volume 3—Social Studies package.

PAT KALLIO
Marketing Coordinator, MECC
St. Paul, Minnesota

A SHOPPER'S DELIGHT

I have always enjoyed reading FAMILY COMPUTING. But when I saw the December 1984 issue with the "Shopping Guide for Computer Lovers," I was thrilled with your magazine.

I am the type of person who likes to look through catalogs comparing products and prices. I am always on the watch for good computer products at reasonable prices. Even if I don't plan on buying, I know that I can still compare with other dealers and pass the information on to my friends.

The section titled "Picture Perfect" really caught my eye. My family has been considering the purchase of a light pen and art software. This section will help us to plan and carry out our purchase.

Once again, I thank you for this wonderful feature, and I hope to see more "Buyer's Guides" and other wonderful features in the future.

DONALD IORIO
Atascadero, California

DISK DRIVES FOR THE TI

Ah, come on folks, give us TI-99/4A owners a break! Just because Texas Instruments abandoned us doesn't mean everyone else has. Your article on disk drives (September 1984) would lead a person to believe that there are none for the 99/4A. Quite the opposite is true! There are a number of units by various manufacturers available for the old girl. (The disk drives are made by TEAC [half-height], Shugart, and Control Data Corp. CORCOMP and Myarc,

among others, manufacture disk controllers, etc., for the TI-99/4A.)

So, she ain't dead yet.

R.W. WALTER
Wheaton, Illinois

EDITOR'S NOTE: Thanks for the hot tip. We listed disk drives that came with controllers for various computers, so that shoppers wouldn't have to assemble the units themselves. But, we're glad for the additional information.

CALLING ALL COCO OWNERS

As owners of TRS-80 Color Computers, we are interested in contacting other Color Computer owners to exchange programs and ideas. Please contact either John Lutsie, Route 9, Box 312, Asheboro, NC 27203; or Helen Reynolds, P.O. Box 754, Ramseur, NC 27316.

HELEN REYNOLDS
Ramseur, North Carolina

NOT FOR KNOW-IT-ALLS ONLY

Your magazine is really great. Along with your magazine, I have a subscription to one other computing magazine, and I have read many others. In my opinion, FAMILY COMPUTING ranks high above them all.

I own a VIC-20, and I don't have expanded memory. FAMILY COMPUTING has programs that don't require it, unlike the programs from other magazines.

FAMILY COMPUTING isn't mainly for the "computer know-it-alls." In most other magazines, they talk about things I don't need or really don't care about. FAMILY COMPUTING doesn't do that. I really enjoy your magazine.

JERRY LITTLE, age 13
Pierce, Idaho

UPDATE

As we go to press, Spinnaker Software is changing the name of its Trillium line to Telarium. The *Fahrenheit 451* and *Amazon* programs mentioned on pages 68, 69, 72, 80, and 86 of this issue are now being marketed under the Telarium label.

STAY TUNED

Watch for the FAMILY COMPUTING TV Show on the Lifetime cable television network. The show presents 30 minutes of product demonstrations and helpful tips to make computing life a bit easier for every member of your family. Two new shows are presented each week at 10:30 a.m. EST on Tuesdays and Thursdays.

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BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS EDITED BY JUNE ROGOZNICA

Computers in the Home Improve Attitudes at School

Are children without access to computers receiving training equivalent to those who have computers in the school? And, what about those children who have additional access to computers in their homes? These issues are known as the equity question.

A recent study, conducted by New York University and cosponsored by the New York City Board of Education and the Police Athletic League, was designed to help shed some light on the subject. The study, involving 46 low-income, minority children ages 7 through 14, from the Bronx, evaluated the impact of personal computers on children and families—particularly those families that ordinarily could not afford the equipment.

Twenty-five of the computers used in the study were donated by Leonard Fassler, a former South Bronx resident, now president of his own telecommunications company.

Researchers compared 22 children who used computers in the classroom with 24 students who used computers in the classroom and in their homes. According to their findings, children who had the opportunity to use computers in both home and school environments gained significant educational as well as social benefits. Their school attendance records improved, they had a better attitude toward learning, and they developed strong feelings of self-esteem and accomplishment.

None of the students was given commercial software to use. Instead, the emphasis was on developing programming skills. Says Liz Burton, who taught at the computer center: "It [programming] does something for their thinking. There is no course in thinking skills. This gives them an avenue of attack." Burton says that computers give the students a sense of importance and personal worth that helps them develop career goals.

Another important outgrowth of the computer program was the increased involvement of families and neighbors in the education of the children in the community. Says Serena Pressley, the mother of a 12-

year-old student in the project, "I like the idea of bringing the family closer together and bringing learning closer. I may not understand everything he's doing, but I could be taught. He teaches me, and I teach him back."

—LAURA BERNSTEIN

Beauty to Boot

Remember the slick salesclerk who assisted you at the cosmetics counter, helping you choose the best makeup combinations for your skin color and facial features? Forget her. Forget lipstick testers and blush samplers. They've been replaced by "Elizabeth," a \$250,000 computer.

The latest marketing strategy from Elizabeth Arden and Shiseido Inc., two major cosmetics firms, is designed to dazzle the public by turning beauty into a science that's more than skin deep.

Two applications have been developed: makeup simulation and skin analysis. Arden's Elizabeth has one megabyte of RAM, more than 250,000 pixels on its four-part split-video screen, thousands of color combinations, and eight different cosmetic brush sizes. If you're lucky you can catch the traveling cosmetics computer as it tours American department stores.

The skin analyzer scans the surface of your face (you don't even have to remove your makeup), digitizes the reading of your skin's texture, and then profiles its special characteristics. After you respond to a series of prompts on the computer screen, you receive a printout evaluating your skin and recommending appropriate skin-care products.

Says Joan Evans, executive vice president of a marketing agency that recently established a Computer



Beauty division: "Beauty is a very emotional subject—the computer provides authority and objectivity without injecting personality into its recommendations."

—ROXANE FARMANFARMAIAN

Downhill Design On a Disk



Next time you hit a mogul and land skis up and face down, don't blame Mother Nature. Blame the United States Forest Service and its Hewlett-Packard computer. That's who's choosing the course of some ski slopes in Colorado.

Clearly, the Forest Service isn't in the business of plotting how to wipe out skiers. It is in the business, however, of preventing landslides and erosion on the slopes. Foresters in the Denver office use their computer to hold a data base of visual resources—the location of tree clumps, the degree of the slopes, and the various soil types. With this information in hand, or more accurately, on disk, the foresters can make objective decisions on the best location for ski runs.

For example, Jim Gregg, a winter-sports specialist for the United States Forest Service, works with a landscape architect to get a conceptual rendering of the ski area from various vantage points. After digitizing the mountain's contour lines, they use the computer to superimpose the tree clumps and proposed runs and lifts, in a process that is quicker and more accurate than past methods.

The Forest Service hopes to improve the computer program to include options such as adding the tops of gondola and ski-lift towers to the computer printout to see how they blend in with the tree line. Unfortunately, the Service hasn't yet discovered a way for skiers to hit an ESCAPE key to avoid a wipeout.

—LINDA WILLIAMS

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in less time than it takes you to balance your check book.

Nothing else — no other program at twice the price — makes handling your personal money matters simpler, faster and more direct than **Your Personal Net Worth**.

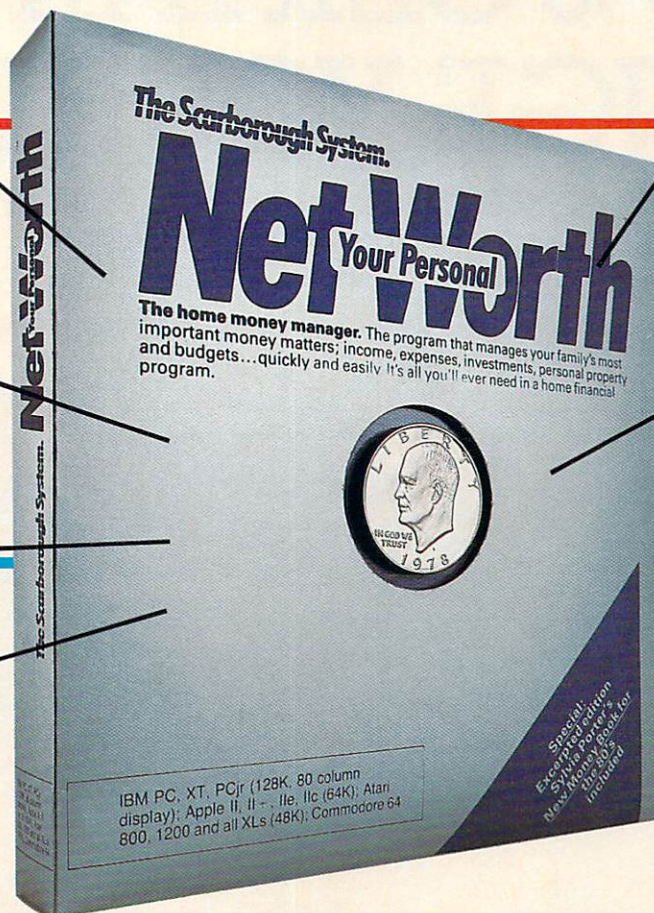
You'll find it at your favorite software retailer in the silver box with the real silver dollar on the front. It could be the single most valuable purchase you'll ever make.

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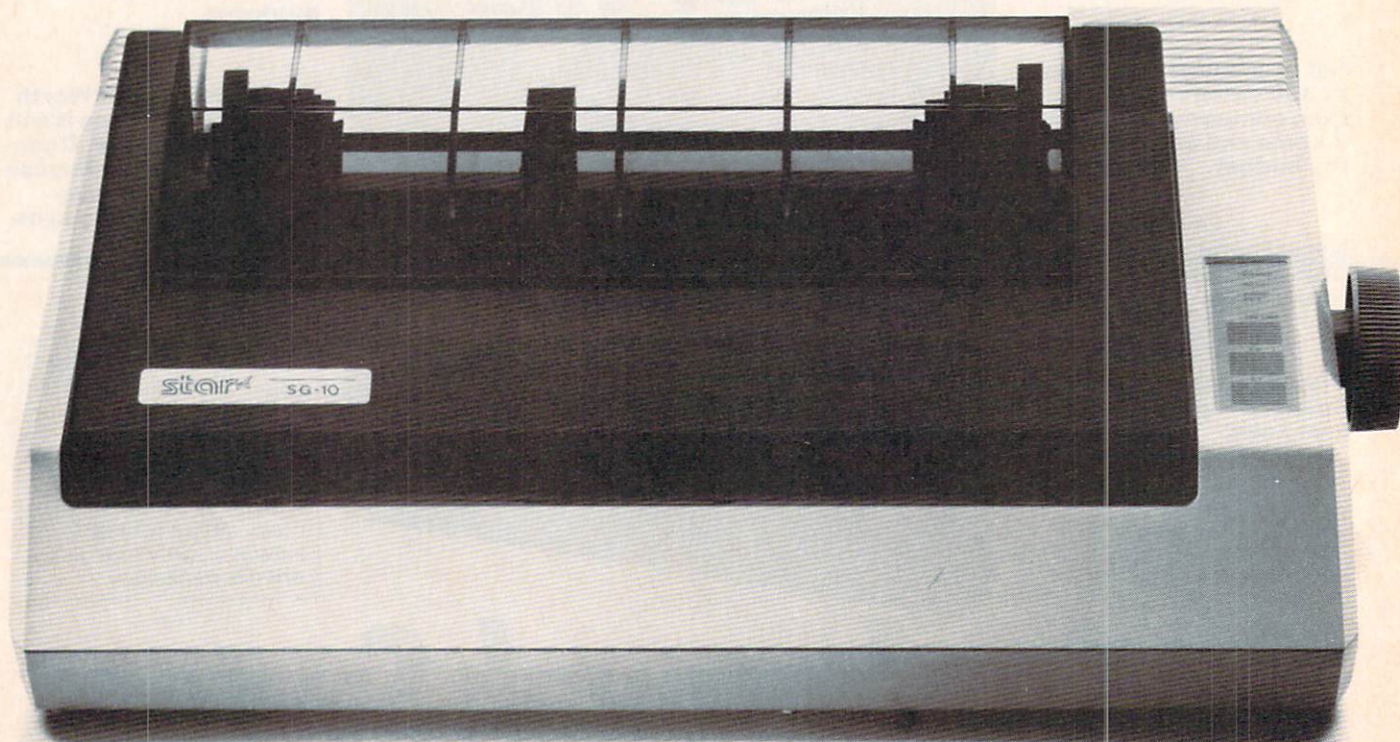
Available for:

IBM-PC/XT/PCjr (128K)
Apple II+/IIe/IIc (64K)
Commodore 64
Atari (48K)
The Program comes with two disks, one of which has accounts already set up for entry. However, only one disk drive is necessary.

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READY FOR ANY SOFTWARE

The new "S" series printers make printing as easy as 1-2-3.™

Which is just one example of the many spreadsheet programs they're ready for.

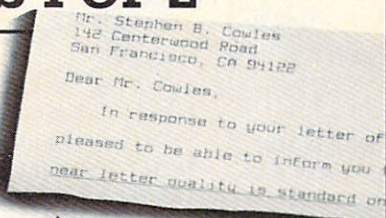
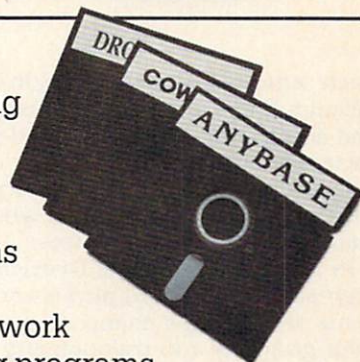
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HOME-SCHOOL CONNECTION

COMPUTER SIMULATIONS

Software that "Brings Learning to Life" in School and at Home

BY JOHN WALLACE

Each semester, students in Edward Valentoukonis' high school business and accounting classes buy and staff their very own companies. They decide when to order new inventory, when to take out a loan, and what to charge for goods and services.

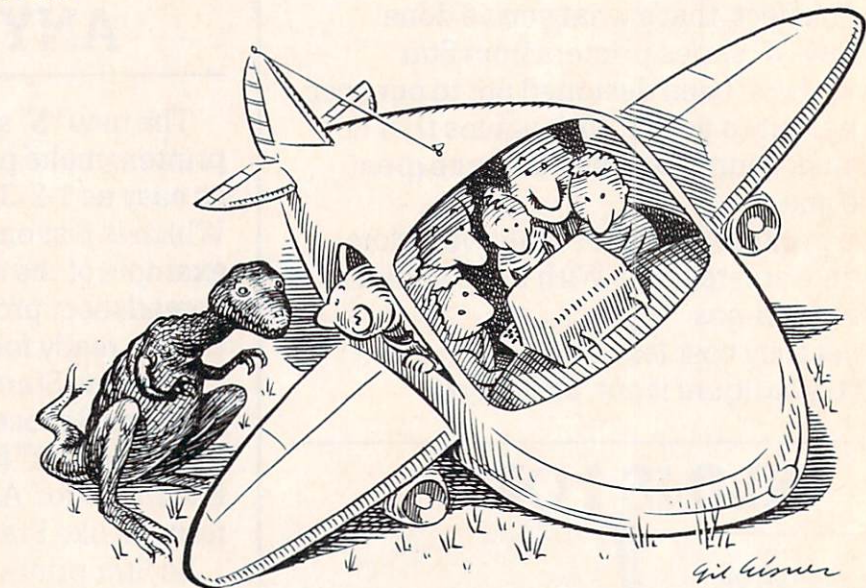
In the Houston School Districts, high-school math and physics students are getting a chance to put their geometry and trigonometry skills to work—while flying a small twin-engine airplane.

These aren't revolutionary projects for aspiring high-school entrepreneurs and aviators. They're computerized simulations—software that recreate experiences you'd have trouble duplicating in a classroom or living room. By operating a business or flying an airplane, kids and adults—at home and in school—are exploring completely new environments, learning new skills, and applying old ones.

Take the business simulation mentioned above: In *The Whatsit Corporation*, from Sunburst Communications, students manage an imaginary firm for a period of six months (actually taking up only one to five hours of classroom time). Launching their ventures with \$10,000 and working alone or together as a board of directors, kids examine their potential markets in a "community survey." Not only are they getting a chance to put their math skills to use, they learn, hands on, how a small business works.

Computer simulations like this are found in classrooms all over the country. "They bring a part of the educational process to life," says Valentoukonis, program chairman for the Business and Office Education Department for his school system in Danbury, Connecticut.

Simulations have been on the educational scene for years, enlivening the classroom well before the computer took up residence. Teachers recognized that pen-and-pencil sim-



ulations—activities in which students monitor the progress of a mock stock portfolio, for instance—can be valuable aids when trying to get across tough-to-grasp concepts.

Computer simulations do away with real-time and real-space limitations. You don't have to wait a few days to see the stock market fluctuate. You can travel far afield. Computerized simulations also bring the power of these activities to the home.

"They let you manipulate kinds of variables you couldn't normally in school," says John Marchisotto, director of computer education for the Huntington, New York, school system.

Take *Geography Search* (McGraw-Hill), a simulation of an ocean voyage undertaken in ancient times. As crew members of a sailing ship bound for an unexplored New World, students face changing winds in an uncharted sea using the stars and sun to help chart the course. The computer collapses the amount of time it would take to embark on such an expedition and disposes of the dangers of transatlantic travel.

Students become more brazen playing a simulation. According to Michael Rony, a member of the team behind *The Whatsit Corporation*, "They can experiment with strategies without worrying about real-life consequences. There's plenty of room for trial and error."

If you decide to take a vacation in *The Whatsit Corporation*, and you don't have enough "whatsits" in stock, you may have a problem come next month when you haven't been able to sell enough units to pay off your loans. What if you stock up on inventory beforehand? It's these "What if" possibilities that make for the unique opportunity to explore and learn about an environment.

SKILLS IN A REAL-LIFE CONTEXT

"You can lecture and lecture all you want," Valentoukonis explains. "Using a simulation brings the business world to life." Business courses, social studies, physics, astronomy, chemistry, biology—all these subjects benefit from simulations.

"Certain concepts are difficult for students to learn," explains Jane Manzelli, acting computer-science curriculum coordinator for the Brookline, Massachusetts, school district. *Geography Search* works wonders in her sixth- to eighth-grade classes. "When they have to set their course, read, and plot their position, the concepts become more meaningful," she says.

By calling on students to use skills such as math to complete a payroll or operate a business, simulations help enforce the value of these skills.

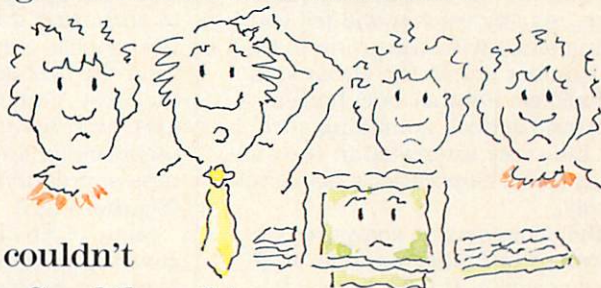
JOHN WALLACE is FAMILY COMPUTING's reviews editor.



How the Nice Family Helped Their Good Neighbors

It was after Christmas. The Nice family was still enjoying all the wonderful presents they received from one another. But next door, at the home of their Good neighbors, things weren't all that wonderful.

● You see, Mr. and Mrs. Good (Harry and Betty) had given a new home computer to their twins (Kim and Kerry). It was a very good gift, but they didn't know what to do with it. Harry Good thought video games were bad because the twins couldn't play them together. Betty Good thought



all video games were too violent. And the Good twins thought anything *but* games were boring! ●

Then, one day, Betty Good was talking to Janet Nice over morning coffee. "We have this wonderful computer, and nothing to do with it!" moaned Betty. Janet just smiled, and told Betty all about

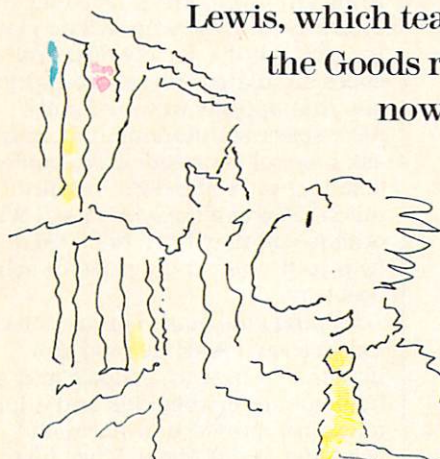
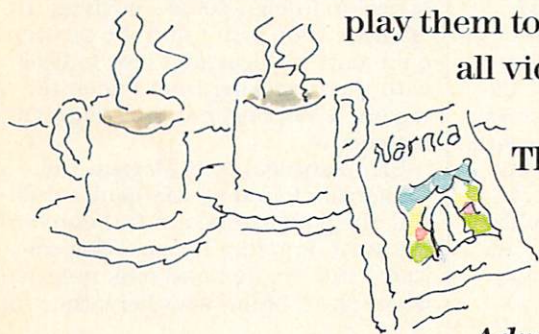
Adventures In Narnia, a new series of **Word LifeWare™**

computer games from Word Publishing. These games are the first ones the whole family can share. And they're based on the famous stories of Narnia by C.S.

Lewis, which teach lasting values good for *everyone* to learn. ● Well,

the Goods rushed out and bought *Narnia* and *DawnTreader*. And now the Good twins play with their new computer all the

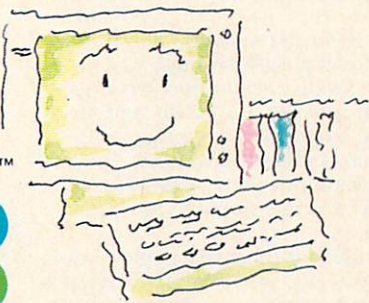
time. Harry and Betty Good play with them, too. And they all agree *Adventures In Narnia* are the best games they could have. ● Maybe they'd be good for your family, too!



Narnia and *DawnTreader* are available at computer specialty stores and all fine bookstores. All *Adventures In Narnia* games are compatible with Apple II series® and Commodore 64™ home computers.



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HOME-SCHOOL CONNECTION

Simulations also have the advantage of being good for the group. According to *Search* series author Tom Snyder, "The great part of school is the big social scene, when kids are learning together. They get a problem to solve from the computer and they run around and talk to each other." As any teacher will tell you, getting along with the group is lesson number one in the classroom.

Challenge number one, both at home and school, is making sure that kids stay interested in the subject at hand. Simulations help enormously.

Ethel Chapman, a computer lab instructor in California, has "K-7" classes come to the lab to practice their math skills—among other things. "Sometimes a simulation has a fun atmosphere," Chapman reports. "And if students enjoy it, they'll use it more."

Fun is what's going to keep your family using and learning from these simulations. In general, those tailored with an at-home audience in

mind feature more of what teachers and developers describe as "motivational" elements—extra effects to keep users coming back for more.

For one thing, "there've got to be more graphics," says Tom Snyder. "And, they've got to be enjoyable for a smaller group of kids." In addition to authoring the *Search* series for the schools, Snyder is the force behind the best-selling *In Search of the Most Amazing Thing* (Spinnaker), award-winning *Agent USA* (Scholastic), and a fast-moving business simulation, *Run for the Money* (Scarborough).

Many of Snyder's simulation games bear only a slight resemblance to worlds you and I would recognize. In *Agent USA*, for instance, you must halt the infection of the U.S. by alien Fuzz forces. Using a train system that's criss-crossing the continent connecting various major U.S. cities and capitals, you locate the source of the Fuzz invasion, the Fuzzbomb, and defuse the danger before it turns the entire na-

tion into Fuzzbodies. Geography skills aren't the only thing rubbing off on Fuzzbusters. Players also develop strategies. "Problem-solving is the main benefit of good educational software at home," Snyder says.

You know a simulation has done its work, Snyder says, when you "walk by the kids' room, and hear them saying, 'I don't think the quickest way to go to Tulsa is to go through Albuquerque from Seattle.'"

In Search of the Most Amazing Thing launches you on a mission to discover a treasure. In the process, you have to maintain adequate fuel and nutrition levels, learn foreign languages, and compose songs that appeal to foreign people, such as the "girlfleez." You won't find the girlfleez on a map, but learning how to deal with them, moving from region to region, is not only entertaining, it's instructive.

Erin Panttaja, 9, of Morgan Hill, California, found arcade games dull. But she got absorbed in *In Search of the Most Amazing Thing*. "She collected information and took notes on where she'd been," says her father Jim.

SIMULATION SAMPLER

Here's a selection of the best of what simulations can offer your family:

T.rex (CBS) puts you in the claws of a dinosaur stalking the land in search of sustenance during the Triassic period (see review, this issue). The program's "What if" option lets you adjust certain settings like the dinosaur's speed and the temperature of the dino's environment, and then see how these changes affect the dino's survival.

In *Trains* (Spinnaker), you transport commodities around a track, taking products from producers to manufacturers—all to music set to a jazzy locomotion beat. Kids learn about supply and demand, and have fun in the process.

Cell Defense (HesWare) puts you at the helm of a cell's immune system. Using the joystick, you direct the organism's antibodies, its T-Cells and Macrophages, to the site of a burgeoning infection. Different antibodies have different immunological properties, so players can experiment with various strategies.

In *President Elect* (Strategic Simulations) you run candidates with preprogrammed platform positions or enter politicians of your own creation in a presidential race. It calls primarily upon resource-management skills. Players decide how best to spend campaign funds and time. Should they woo the electorate on national or regional TV commercials? Should they debate? News events and fluctuations in public-opinion polls introduced randomly into the race contribute to the simulation's realism.

In *Run for the Money* (Scarborough), players control two "Bizlings," attempting to make enough money from the manufacture and sale of "synannas" so that they can purchase special antigravity paint and launch their stranded spaceships to fly home. The game is fast-paced, and actually introduces the basics of supply and demand, the value of advertising, and more.

Flight Simulator II (subLogic), an outstanding re-creation of the experience of flying a small twin-engine airplane, has set a standard of aviation simulation. Take off (with difficulty and lots of practice) from Meigs field and fly around Chicago. A detailed flight-control panel and authentic landmarks in the terrain make for a genuine (occasionally stomach-churning) experience.

Operation Frog (Scholastic) cleans up the formaldehyde-drenched process of frog dissection. With less of a game atmosphere, it relies primarily on kids' own motivation to explore, taking the frog apart and putting it back together. Families report that their children have taken steps in a subject that has never before interested them.

Seven Cities of Gold (Electronic Arts) launches you on a 15th-century expedition to the new world. Your ultimate goal is the favor of the Queen—the means to that end are varied. Should you amass great fortune? Or concentrate on converting native civilizations into loyal subjects of Christendom? You must plot your course, map your way, and decide which provisions to include on the voyage or do without.

WHO WILL PLAY?

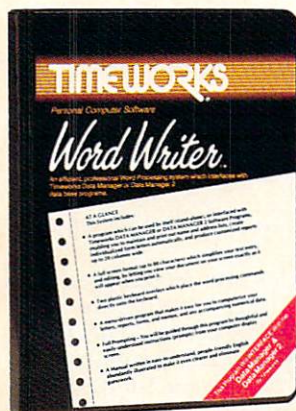
When considering the array of simulations software, and what to buy for your family, keep a few things in mind. First, consider the interests of those who will be playing. Among the variety of experiences simulated, there's bound to be one that appeals to your family. Also, select simulations that won't ask more of your time than you're able to give. Some don't require much time at all on your part. With others, you may have to be there to help your child apply skills or solve problems.

Helping kids make connections on their own is what good simulations do best. In schools and in homes, they enable kids and adults to explore worlds that normally would be out of reach. They furnish the next-best thing to hands-on experience in exploring the galaxy, charting the New World, running for president, and more. ☐

SIMULATION-MAKERS

CBS: (203) 622-2503.
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HesWare: (415) 468-4111.
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Scholastic Software: (212) 505-3567.
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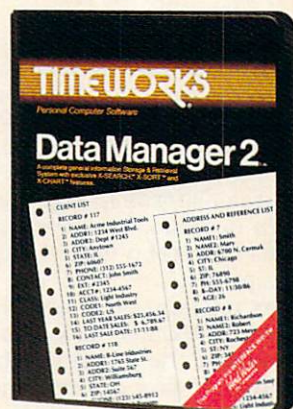
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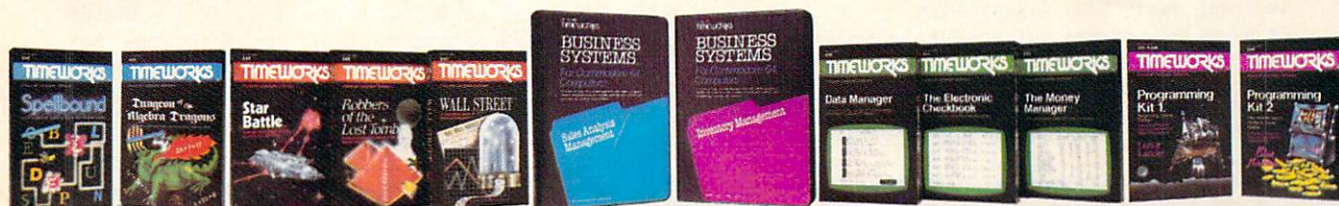
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HOME/MONEY MANAGEMENT

FINE-TUNING YOUR TAX PREPARATIONS

Save Time and Avoid Costly Mistakes.

Set Up a 1040 Worksheet
with a Spreadsheet Program.

BY CHARLES GAJEWAY

For most of us, tax time is a nightmare. When we first receive our filing forms from the IRS, our hands begin to itch. When we pull our shoe boxes of receipts out of the closet, we break into a cold sweat. Whenever a calculator is in sight, our heads begin to throb. And, even after our forms have been mailed out, the illness persists.

Tax preparation doesn't have to be such a loathsome task. You can streamline the process with the assistance of your computer and a spreadsheet package. In the February Home/Money Management department, we discussed how to use an electronic spreadsheet to create a Schedule A worksheet. This month, we're taking the next logical step: creating a 1040 worksheet. These articles were not designed to provide you with expert tax advice, but to help you organize your taxes. Both of these spreadsheets should save you time by eliminating many of the

repetitive calculations that are often a source of errors. In addition, they could actually save you money normally spent on a \$50-an-hour accountant. In the end, when April 15 comes near, you will have more confidence that the tax forms you file are accurate.

This article is a hands-on guide. If you've never used a spreadsheet, stop! Take some time to familiarize yourself with one before you attempt to set up your 1040 worksheet. Of course, you don't have to use a spreadsheet; you can use a commercial tax program. (For a clear description of what a spreadsheet is and how to use one, see "Let Your Computer Plan the Party," in the July 1984 FAMILY COMPUTING, page 32.) Setting up your 1040 worksheet will not be a simple task; it will take several hours of your time. So, when you're ready to devote your time and brainpower, load your spreadsheet program and follow the

instructions in this article step by step.

The formulas and techniques used to set up our sample printouts were created using VisiCorp's VisiCalc, but other spreadsheet programs should work with some formatting and command modifications. (Check your spreadsheet manual for specific instructions.) For clarity, entries you type in appear in SMALL CAPITAL LETTERS, and the instruction to press the carriage return is denoted ENTER.

If you plan to use Schedule A (Itemized Deductions) this year, load the file from last month and start building your 1040 model. If you don't plan to itemize, you'll need to make minor changes in the 1040 example provided. First and foremost, you'll need to set your column widths to 18 characters. Type /GC18 (global column width 18), then press ENTER. Now you're ready to get started. →

| AD | AE | AMOUNT |
|----------------------|--------------------------------|--------|
| 1 1040 SUMMARY | | |
| 2 | | |
| 3 TOTAL INCOME/L 23 | +S21 | |
| 4 TOTAL ADJ/L 31 | +U21 | |
| 5 A G INC/L 32 & 33 | +AE3-AE4 | |
| 6 DEDCTNS/L 34(A/B) | +P13 | |
| 7 NET INCOME/L 35 | +AE5-AE6 | |
| 8 EXEMPTIONS/L 36 | 2000 | |
| 9 TAXABLE INC/L 37 | +AE7-AE8 | |
| 10 TAX/L 38 | @LOOKUP(AE9,A21...A61) | |
| 11 ADDI TAXES/L 39 | 0 | |
| 12 SUBTOTAL/L 40 | +AE10+AE11 | |
| 13 | | |
| 14 TOT PER CRED/L 45 | +W21 | |
| 15 SUBTOTAL/L 46 | +AE12-AE14 | |
| 16 TOT BUS CRED/L 49 | +Y21 | |
| 17 SUBTOTAL/L 50 | +AE15-AE16 | |
| 18 | | |
| 19 TOTAL TAX/L 56 | +AA21+AE17 | |
| 20 | | |
| 21 T PAYMENTS/L 64 | +AC21 | |
| 22 | | |
| 23 OVERPAID | @IF((AE19<AE21),(AE21-AE19),0) | |
| 24 AMOUNT YOU OWE | @IF((AE19>AE21),(AE19-AE21),0) | |

| AD | AE | AMOUNT |
|----------------------|----|-----------|
| 1 1040 SUMMARY | | |
| 2 | | |
| 3 TOTAL INCOME/L 23 | | 32,800.00 |
| 4 TOTAL ADJ/L 31 | | 5,000.00 |
| 5 A G INC/L 32 & 33 | | 27,800.00 |
| 6 DEDCTNS/L 34(A/B) | | 5,951.00 |
| 7 NET INCOME/L 35 | | 21,849.00 |
| 8 EXEMPTIONS/L 36 | | 2,000.00 |
| 9 TAXABLE INC/L 37 | | 19,849.00 |
| 10 TAX/L 38 | | 3,320.00* |
| 11 ADDI TAXES/L 39 | | 0.00 |
| 12 SUBTOTAL/L 40 | | 3,320.00 |
| 13 | | |
| 14 TOT PER CRED/L 45 | | 500.00 |
| 15 SUBTOTAL/L 46 | | 2,820.00 |
| 16 TOT BUS CRED/L 49 | | 500.00 |
| 17 SUBTOTAL/L 50 | | 2,320.00 |
| 18 | | |
| 19 TOTAL TAX/L 56 | | 2,320.00 |
| 20 | | |
| 21 T PAYMENTS/L 64 | | 3,000.00 |
| 22 | | |
| 23 OVERPAID | | 680.00 |
| 24 AMOUNT YOU OWE | | 0.00 |

*Based on the 1983 tax table

The printout at left shows the formulas needed for the 1040 summary section of the worksheet, while the printout at right shows the final tally. These printouts, created with VisiCalc Advanced Version, will vary slightly from your final printouts. For example, the row numbering, column headings, and horizontal lines may not appear on your final printouts.



Reach for new horizons

It's never easy. But reaching for new horizons is what aiming high is all about. Because to reach for new horizons you must have the vision to see things not only as they are, but as they could be. You must have the dedication to give the best you have. And you must have the courage to accept new challenges.

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AIR FORCE

HOME/MONEY MANAGEMENT

1. REVIEW YOUR 1040

With pencil in hand, look at the 1040 provided by the IRS. Notice that, like Schedule A, the 1040 is divided into a number of sections. We will be concerned with Income, Adjustments to Income, Personal Credits, Business Credits, Other Taxes, and Payments. Each of these sections contains a number of items. For example, the Income section on your 1040 includes a breakdown for "wages, salaries, tips, etc."; "interest income"; "dividends"; and other items. You probably won't have to use many of these items, but that will depend on your particular situation. To save some typing, take a few moments to review each row, putting a check mark next to those items you need to put into your 1040 worksheet.

2. CREATE COLUMN HEADINGS

Last month we started our 1040 Schedule A worksheet in column A and ended it in column P. To simplify the process for all our readers, we will begin this month's 1040 worksheet in column R. Beginning in this column, create six two-column sections, one for each of the headings noted. You will have to abbreviate Adjustments to Income (ADJ TO INCOME) to make it fit into the 18-character-wide column. The first column will be the labels of the items you checked off on your 1040, and the second column will be used for your actual dollar amounts. You'll add a TOTAL formula at row 21 of columns S,U,W,Y,AA, and AC. The TOTAL formula is @SUM(S3...S7) for column S if you have five entries. Here's how your screen might look.

| | R | S |
|----|-----------------|---------------|
| 1 | INCOME | AMOUNT |
| 2 | ----- | ----- |
| 3 | Wages, salaries | 22,000.00 |
| 4 | Interest income | 1,000.00 |
| 5 | Business income | 5,000.00 |
| 6 | Rent | 3,600.00 |
| 7 | Other income | 1,200.00 |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | | |
| 18 | | |
| 19 | | |
| 20 | ----- | ----- |
| 21 | TOTAL INCOME | @SUM(S3...S7) |

The above printout shows how the sum formula works in the INCOME column if you need to include five sources of income on your tax form.

3. BRINGING IT ALL TOGETHER

Next we come to the 1040 SUMMARY section, probably the most difficult of the worksheet. In this section, line numbers which correspond to your 1040 are provided. First, move to AD3. Enter the labels shown in the printout far left, starting with the label, TOTAL INCOME/L 23, and moving down column AD until you reach AMOUNT YOU OWE.

Move to AE3 and enter +S21. Move to AE4 and enter +U21. In AE5, enter +AE3-AE4. In AE6 enter the appropriate dollar amount for your DEDUCTIONS (or, if you used Schedule A, enter the formula +P13). The formula for AE7 is +AE5-AE6. Enter your total EXEMPTIONS in AE8. Now you must figure out your total taxable income by moving to AE9 and entering the following formula: +AE7-AE8. This brings us to the actual tax computation, and a new spreadsheet function—the "lookup table." Most taxpayers are familiar with tax tables, where you look up the amount of your taxable income, then move across columns of figures to find the related tax amount. A big source of errors on tax returns comes from simply using an incorrect tax amount, an easy error to make if you've already gone through the exercise 17 times in one evening. You can automate the process, and let the computer pick the right amount every time.

(If you're not using a tax table, you'll have to figure out your taxes separately and insert the amount in AE10. Then, skip to "Finding Your Bottom Line.")

4. CREATING A LOOKUP TABLE

First, get an idea of your taxable income by subtracting your exemptions and an estimate of your net deductions from your W-2 income plus interest and dividends. Now move to A20 and enter TAX TABLE. In A21, enter a number \$2,000 less than your estimated taxable income, rounded to the nearest \$50. Move to A22 and enter 50+A21, press ENTER, and type /R ENTER A23...A61 ENTER R. This will create a column of numbers extending from \$2,000 less than your estimate up to your estimate in \$50 increments, just like in the tax tables.

Move to B22. Look in the tax table for the tax on the amount in column A22 for your filing status. Go down the worksheet, one row at a time,

and enter the next higher tax amount from the table until you have reached the last number in column A. You now have created an automated lookup table for a \$2,000 range of taxable income. If you want to extend the table so that it covers amounts greater than your estimate, just make column A longer. For example, change A23...A61 to A23...A75 to allow more entries; expand column B accordingly.

Return to AE10 and enter the following formula: @LOOKUP(AE9, A21...A61). This formula takes the amount in AE9 and compares it to the values in column A, row 21 through row 61, until it finds a match. Then, it returns the corresponding amount that appears in column B. If AE9 falls between two amounts in column A, the formula gives the answer for the lower number, just like the tax table. If AE9 is smaller or larger than the amounts in column A, the formula gives NA (not available) for an answer.

5. FINDING YOUR BOTTOM LINE

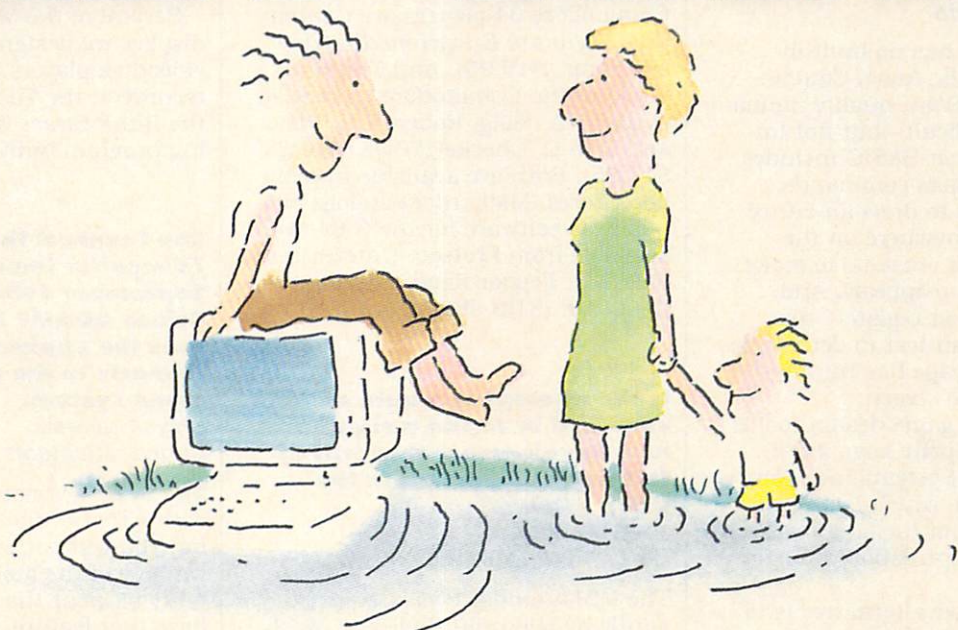
Most people don't need to use an additional tax form, but if you do, enter the amount from that form into AE11. At AE12 enter +AE10+AE11. Before you can determine your final tax, there are two kinds of credits—personal and business—which you must subtract from your earlier total. To do that you must enter +W21 at AE14 and +Y21 at AE16. Then supply subtotals by entering the formula +AE12-AE14 at AE15 and +AE15-AE16 at AE17.

The formula +AA21+AE17 at AE19 computes your total tax by adding to the subtotal at AE17 the total of the OTHER TAXES you entered in column AA. At AE21, the formula +AC21 will bring forward your total payments. Finally, the formula @IF((AE19<AE21),(AE21-AE19),0) at AE23 will tell you the amount you overpaid in taxes, if you did. If you didn't, you will get 0 and the formula @IF((AE19>AE21),(AE19-AE21),0) at AE24 will tell you what you owe Uncle Sam.

Now just store your 1040 worksheet, and with minor modifications, you'll have the framework for next year's taxes this year. ☐

CHARLES GAJEWAY is a contributing editor for FAMILY COMPUTING. He wrote last month's Home/Money Management article, "How to Cope with Your Tax Return."

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COMPUTING CLINIC

ARCADE GAMES FOR APPLE II • THE JAPANESE MSX STANDARD • BUSINESS PROGRAMS FOR THE COMMODORE 64 • TV/MONITOR FOR THE ADAM

BY JEFFREY BAIRSTOW

How can I write graphics programs similar to arcade games for my Apple IIe?

CHARLES PAYNE
Golden, Colorado

Since the Apple has no built-in sprites, unlike the Atari, Commodore 64, or TI-99/4A, quality animation is more difficult—but not impossible. Applesoft BASIC includes the DRAW and XDRAW commands, which allow you to draw an entire shape at once anywhere on the screen, and then erase it (to make the background reappear). And, there's a "collision register" that your program can test to determine whether your shape has hit anything else on the screen.

One potential game-design tool is the new Apple Sprite Logo (\$299, Logo Computer Systems Inc., New York, New York), which is an impressive version of the language, and also includes a sprite board for the Apple IIe.

A less expensive alternative is to start with programs that can be modified to suit your purposes. I'd suggest you get a copy of *Animation, Games and Sound for the Apple II/IIe*, by Toni Fabbri (Prentice-Hall, \$16.95). This book has a selection of graphics programs in BASIC that you can adapt to make your own games. The book is available with a companion disk, which includes the programs mentioned.

Where can I obtain a catalog of business software for a Commodore 64?

BEVERLY J. SHIELDS
Binghamton, New York

Several companies offer business software for the Commodore 64. The best known package is probably the top-selling spreadsheet, *Multiplan*,

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

but there are also inventory management, accounts receivable and payable, payroll, and general-ledger programs. Two popular sourcebooks for Commodore 64 owners are *Commodore Software Encyclopedia* (Howard Sams, \$19.95), and *The Blue Book for the Commodore 64*, edited by Barry A. Fleig, Robert F. Cutler, and Tom C. Checkel (WIDL Video, \$17.95). Both are available in most bookstores. Mail-order catalogs of business software for the C 64 are available from Protecto Enterprises, 22292 N. Pepper Road, Barrington, IL 60010; (312) 382-5244.

Is the attempt to create an MSX standard in Japan a significant new development that will affect home computers in the U.S.?

JOSEPH AUSTIN
Cary, North Carolina

The MSX standard was developed jointly by Microsoft (Bellevue, Washington) and 14 Japanese companies, including such well-known consumer-products companies as Sony, Canon, Pioneer, Matsushita, Mitsubishi, Hitachi, Toshiba, Yamaha, JVC, and Sanyo. Three Korean companies, the German firm Siemens, and the Dutch firm Philips also have purchased the license to manufacture MSX computers.

MSX computers conform to certain specifications: the same 8-bit microprocessor, the same audio and video chips, Microsoft BASIC, 8K bytes of RAM (minimum) and 32K of ROM, 40-column display, 16 colors, a cartridge slot, and joystick support.

Although at least 10 Japanese manufacturers sell MSX computers in Japan and Europe, only Spectra-Video (a Hong Kong-based company) and Yamaha are now marketing them in the U.S. Both companies have very limited distribution.

However, Sony, Pioneer, Panasonic, and Toshiba, among other giants, exhibited MSX computers at

the Winter Consumer Electronics Show, in Las Vegas. Representatives from these companies said they were "evaluating" the U.S. market.

Several of the MSX computers on display are designed to interact with videodisk players and videocassette recorders; the Toshiba computer has the *Bank Street Writer* word processing program built-in.


Can I connect the Sears [4084] TV/monitor (mentioned in your September 1984 issue) to my Coleco ADAM? My computer uses the expansion module that connects to the ColecoVision game system.

STEVE CORNWELL
Ithaca, Michigan

The Sears TV/monitor can be used with either of the ADAM systems, but you will not be able to take advantage of the monitor's RGB capability because the ADAM does not have that feature. Thus, it may be slight overkill for your computer.

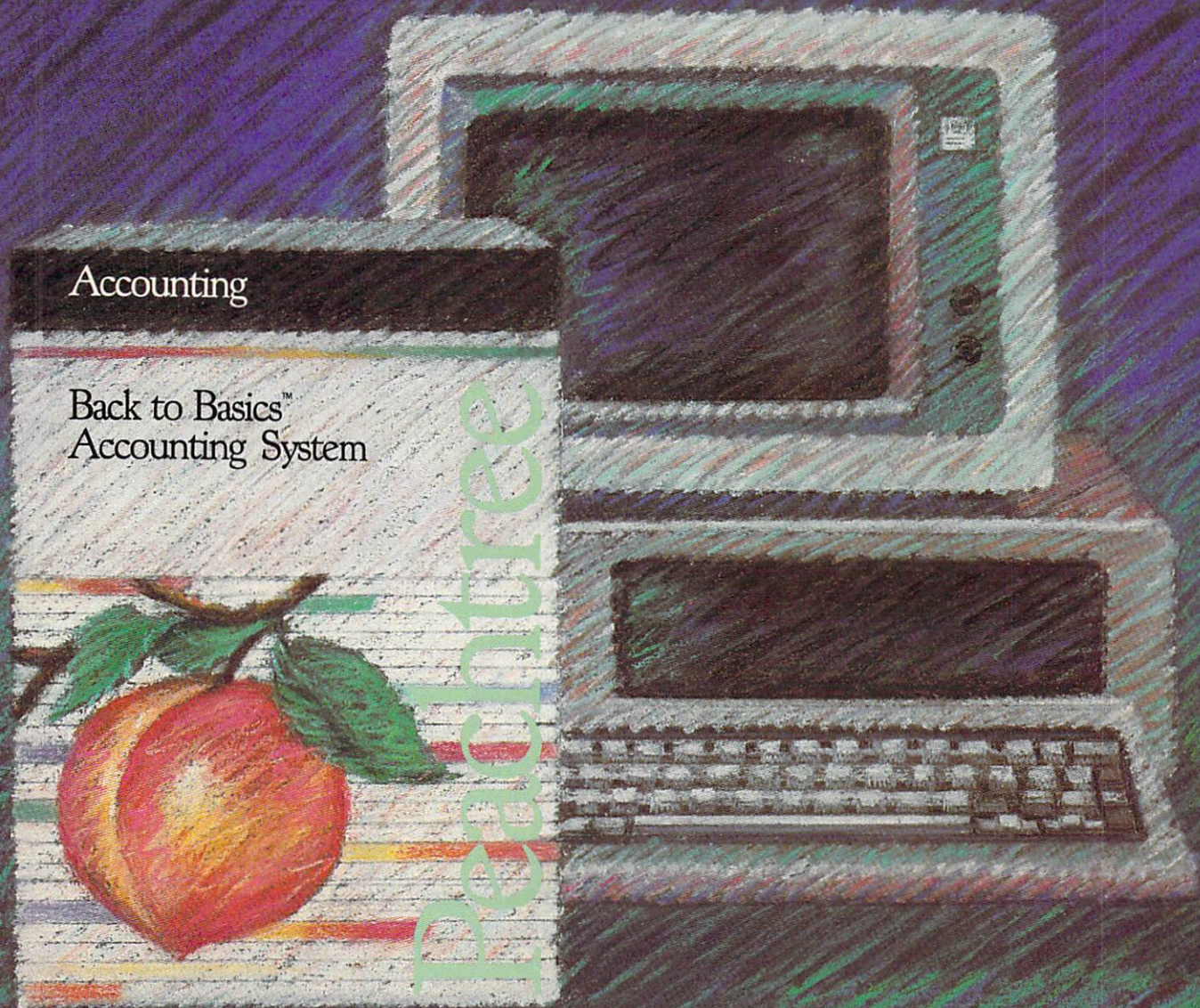
The ADAM unit may be connected to the TV antenna terminals of the Sears unit using the RF modulator, or directly to the video-input terminal of the monitor. Just make sure the monitor is set for 75 ohms.

However, to get sound from this (or any other) monitor, you'll probably need to buy or make a special cable to run from the ADAM's 7-pin AUX VIDEO port to the monitor's audio port. The specifications are given on page 9 of the *ADAM Operating Tips Brochure*, second printing. This brochure did not come with early shipments of ADAM, so check with Coleco at (800) 842-1225 if you don't have it.

Some monitors come with cables that have a 5-pin DIN connector at one end (for the ADAM memory console) and audio and video jacks at the other. These cables may work. 

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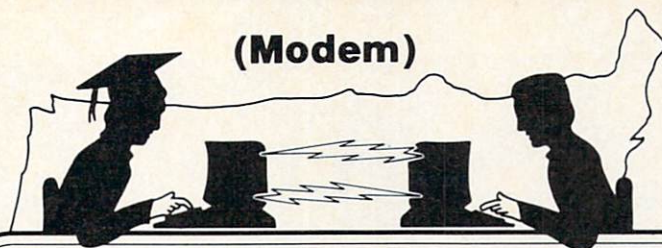
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**FAMILY
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It's Monday, 7:00 a.m. You sit down at the breakfast table, reach over the bacon and eggs, and switch on the computer monitor. On the screen you see:

- ☐ GOOD MORNING. YOU HAVE E-MAIL WAITING.
- ☐ SEE TOKYO TIMES FOR AN ARTICLE OF INTEREST.
SUBJECT: SOYBEANS.
- ☐ MARKET REPORT:
GOLD \$2,543.25—UP 20.10
WORLD DOW AVG. 13432.10—DOWN 65.35
- ☐ LEAD STORY:
DEPT. OF LABOR REPORTS UNEMPLOYMENT UNDER
1% . . . DETAILS ON PAGE NYT-423.

As you sip your coffee you pay the electric, insurance, and phone bills with a few keystrokes, and call up the latest weather map for signs of rain. Another typical day begins.

Science fiction? Well, gold isn't selling for more than \$2,000 an ounce, there's no such thing as a "World Dow Average," and at last report unemployment was hovering well above 1 percent. The facts are wrong, but getting this kind of information on your home computer screen is possible, and can be done right now.

The device that makes it all possible is called a modem. Attaching a modem and add-

ing the right software to your computer gives it the power to "talk" over normal phone lines to other computers anywhere in the world. Just under two million people own modems now, and at least another million are expected to buy them by the end of the year. What's all the excitement about? On the following pages, and in upcoming Telecomputing columns, we'll give you more than a dozen reasons to consider starting to telecompute, and tell you about people who've found it an invaluable way to do business, banking, socializing—and much, much more.

Just for starters, if you're interested in getting information, you can sign on to Dialog's KNOWLEDGE INDEX and have *The New York Times*, *The Wall Street Journal*, *The Christian Science Monitor*, and a variety of other newspapers and magazines at your fingertips.

If you're interested in both sending and receiving information, there's electronic mail (e-mail), a popular message-delivery system provided by The Source, CompuServe, MCI, Western Union, and other services. With e-mail you get almost instantaneous delivery of your messages and often, equally quick replies. And, if your intended recipient doesn't have a computer, he or she can still get a printout of your message via several services.

**TELECOMPUTING
ISN'T ALL
BUSINESS.
MEETING NEW
PEOPLE AND
MAKING
FRIENDS IS A
BIG PART OF THE
FUN.**

Being able to do business while comfortably settled into your favorite easy chair is another advantage of telecomputing. Take banking, for instance. It can be an unpleasant chore—long lines, surly tellers, and inconvenient business hours. Electronic banking allows you to handle most of your financial responsibilities by modem, with the notable exceptions of depositing checks and getting cash.

If the weather report is an important part of your day, you can get up-to-the-minute National Weather Service reports and color maps, including special reports for aviators, or skiers heading up to the slopes.

Whatever your profession, hobbies, or special interests, adding a modem to your computer system can be a big help. Teachers, computer professionals, writers, investors, students, and executives are not just enjoying telecomputing—they're working better and faster by joining forces with the power of a modem.

DIALING A DATA BASE

Just about everyone who's happily telecomputing is succeeding with the help of a data base, i.e. a computerized collection of information. With the number and scope of data bases growing every day, there's sure to be one or more that will interest you. Financial data, newspapers and periodicals, entertainment, medicine, science, and education are just the beginning.

If it weren't for a data base, 24 hours just wouldn't be a long enough day for high-school teacher John Gillen. He teaches physical and biological science to students of lower academic ability in Elmont, New York. He's also the director of student activities for 1,500 teenagers, so he never seems to have enough time to handle his heavy workload. Instead of complaining, John has enlisted the aid of modern technology. To put together a lesson for a physical science class, he asked Grolier's ACADEMIC AMERICAN ENCYCLOPEDIA on CompuServe for information on "engines." Grolier's electronic equivalent of 21 printed volumes delivered four pages of material, including references on other suggested topics. With nine to ten million words on more than 30,000 subjects available on-line, teachers, students, researchers (or anyone!) can save trips to the library and use the new-found time for lesson-planning, other reading, or tap-dance lessons! (John Gillen doesn't use his computer just for schoolwork. He recently "hooked up" with an old friend—one he'd been out of touch with for 10 years.)

You also can use a data base to help search on-line listings for a new job. Or, if the job you have (or the one you want) requires a reassignment out of town, you may find that a modem means you don't have to move. Not long ago, getting that new job in another city always meant relocating or bearing the expense and inconvenience of commuting, or turning down the offer. Now, if it's your brain, not your body,

that's required, you may be able to commute via the phone lines. Even if your employer is close to home, you may be able to telecompute during part of your working week. Companies like Blue Cross, Control Data, and McDonald's are just a few of those offering their employees new options.

Bart Fay is one of these lucky employees. A project engineer for a computer-systems company, he's currently building a system for Baltimore Gas and Electric at its nuclear power plant project in Maryland. The unusual thing is that Bart lives in Florida. He communicates with Baltimore via his computer and modem—he's able to instantly send plans and drawings directly from his Apple computer to an Apple in Baltimore. And it happens faster than the quickest overnight-mail service!

Quick decision-making is also a decided advantage for those who are active in the stock market. It's easy to sign up with one of the growing number of on-line brokers. In addition, you can get the latest stock, bond, and option quotes, place your order to buy or sell, and get confirmation of the trade—all within minutes and without ever talking to a broker or an order clerk.

ALL WORK AND NO PLAY?

Telecomputing isn't all business. Meeting new people and making friends is a big part of the fun. For example, most evenings on CompuServe's CB Simulator, hundreds of people will sign on to trade hellos, quips, and information. Pam Jensen, who met her husband after months of computer courtship on the CB, says, "You spend so much time talking—or rather, typing—to each other that you truly feel you know each other. Before you've ever seen them, you know them intrinsically." Pam hit it off so well with fellow telecomputer Chris Dunn, he finally proposed . . . and there was even an on-line "wedding."

Those are just some of the reasons why people are telecommunicating. There are plenty more, including: accessing free software; transferring information, articles (as we did with this one!), and programs from person to person; participating in on-line conferences; shopping on-line; playing group adventure games; making travel plans and reservations; and joining local bulletin boards or special interest groups (SIGs), one of the best ways possible to get a fast and accurate answer to a computer-related question.

On the following pages we present two telecomputing buyer's guides. The first will direct you to the hardware you'll need: a modem, cables, and, in some cases, an RS-232 interface card. Following that is a guide to communications, or "terminal," software. You need both a modem and software to telecompute. Both articles outline the most important features to look for when shopping, and the accompanying charts will help you make an informed decision. Happy dialing, and see you on-line! ☐

JOE GELMAN is a contributing technical editor to FAMILY COMPUTING and assistant sysop of the magazine's forum on CompuServe.

BUYER'S GUIDE TO MODEMS

BY NICK SULLIVAN

You can't live without the telephone. And you're getting pretty attached to your computer. What if you hooked the two together? Just think—you could send your favorite program to a friend! Play a game with Granny, who lives in Alaska! The necessary link? A modem.

Unlike prices of computers, printers, monitors, and disk drives, prices of modems have not dropped much during the past year. Modems can cost as much as or more than the computers they work with (up to \$900), probably because they've been aimed, to date, more at the business market than the home market.

But the recent introduction of new high-speed (2400-baud) modems for business use means that prices on 300- and 1200-baud modems should begin to drop. After all, a modem consists of a single chip (often made by Texas Instruments), compared to the dozens of chips and circuit boards needed to make a computer, and is relatively easy to assemble. As it is, there are good modems on the market for under \$80 (see chart on next page).

A modem connects your computer to the telephone lines—the same telephone lines you use to order a pizza. The modem translates computer data (an “on/off” digital signal) into data that the phone lines carry (a “wavy” analog signal). Then, the modem at the other end translates the analog signal back to digital so the other computer can understand it. (See “How Does a Modem Work” in the February Dr. Kursor's Clinic.) Think of a modem as an interpreter at the U.N. Better yet, don't think about it at all. Just plug it in and follow directions!

WHAT YOU NEED TO CONNECT

To install a modem and successfully “telecompute” you need, besides your computer, four things:

1. A modem.
2. A cable between the modem and the serial port on your computer; or a plug-in slot for the modem.
3. A standard telephone line with a modular plug (preferable) or a standard telephone handset.
4. Communications software.

Here's a rundown on these four elements, followed by some features that you should look for in a modem.

External Modems. Modems connect to the serial port (RS-232) on your computer with a cable. If your computer comes with the standard 25-pin RS-232 port, as the Kaypro or Compaq do, all you need to connect most modems is the basic 25-pin serial cable.

On Apple II plus and IIe, IBM PC, and some TRS-80 models, you first need to install a serial card, which is not standard equipment on the computer. On the TI-99/4A, you need a serial card and expansion box. All these computers use the standard 25-pin cable. When purchasing a serial card, however, make sure it's designed for communications as well as printers.

Atari and Commodore computers require an interface (such as the Atari 850, for Atari) or special cable, unless you use modems specifically designed for those comput-



ers. These include the Atari 1030 and the Commodore 1650. There are interfaces (such as Omnitronix's Deluxe RS-232C Interface, at \$39) that give the C 64 a standard 25-pin serial port. Make sure you test any such interface with a modem before you buy.

For Timex, both the Byte-Back and Westridge (16K required) modems are designed to plug into the back of the computer. The Apple IIc, IBM PCjr, Macintosh, and TRS-80 Color Computer have nonstandard serial ports and require special cables.

But, just as printer manufacturers have started doing, some modem manufacturers now sell computer-specific cables with the modems. Anchor Automation sells cables for most popular computers (except the C 64); the Apple modems are sold with cables for the Apple IIe, IIc, or Macintosh; and so on. If these ready-made cables are available with the modem, buy them.

Internal Modems. For the Apple II plus and IIe, and the IBM PC and PCjr, there are internal modems. These are circuit boards that plug into slots inside the computer, and act both as serial cards and modems. This is a big plus, saving you the cost of a serial card. (However, if you later decide to buy an external modem, you'll then have to buy a serial card.) Internal modems also save on peripheral clutter around your computer. And, they are obviously designed specifically for one computer, often carrying on-board software (in ROM chips) to help get you started.

The new ADAMLink modem for the Coleco ADAM also fits inside the computer, and comes with software on a digital data pack.

These internal modems can be a good deal. For instance, the new Zoom/Modem IIe for the Apple IIe (Zoom Telephonics) amounts to a serial card, 300-baud modem, and software for \$179. And the modem has a speaker so you can hear the phone ringing, etc. For an extra \$50, you can get a full-fledged communications package.

Built-in Modems. Some of the little “lap” portable computers come with built-in modems as standard equipment. The TRS-80 Model 100, in fact, now selling for under \$400, is a pretty good deal if you think of it as a modem plus a computer. If you don't already have a computer, and think you primarily want to experiment with telecomputing, don't overlook this bargain. Also, see announcements of the new TRS-80 and NEC portables in New Hardware in this issue.

Phone Connection. In order for your computer to communicate with a distant computer, the modem must be connected to the telephone lines. You are simply “making a call,” and sending data instead of your mellifluous voice.

Virtually all modern modems have modular jacks so you can plug in the telephone line. These are called direct-connect modems, to distinguish them from acoustic couplers, the old-fashioned modems with cups that fit over the telephone.

Some modems have two jacks—one for an outside telephone line and one for a line to your phone. This way, you

can keep your phone connected to the modem, and the modem connected to the outside lines. Otherwise, you have to unplug the line from your phone and plug it into the modem whenever you switch from voice to data.

TIME IS MONEY OPERATING COST COMPARISON: 300- vs. 1200-BAUD MODEM

If you use a modem with any kind of regularity, you might want to give serious consideration to a 1200-baud modem. Its extra speed can recoup the extra cost with on-line savings. For instance, though a 1200-baud modem transfers information four times faster than a 300-baud modem, 1200-baud usage rates (off peak) from information services such as CompuServe and The Source are not nearly four times as much. (CompuServe: \$.10/min. @ 300 baud; \$.21 @ 1200-baud. The Source: \$.13/min. @ 300 baud; \$.43 @ 1200-baud.) And, when connected to a bulletin board or sending a file to another computer, you'll generally accomplish the same tasks in one quarter of the time with a 1200-baud modem, thus slashing phone usage costs.

And, as the example below shows, phone time can translate to a big phone bill quite quickly. We used Zone 2 (California) dialing rates, but you should make your own comparison. Use the transmission times listed here, get out the phone book, and make the calculation with your local dialing rates. (In many areas, a local call costs less than \$.10, no matter how long the call lasts.) You might also consider how long-distance rates would add up.

Remember: If you're just "chatting" with someone on the computer, a 1200-baud modem won't do much good. No one can type that fast, and a 300-baud modem is more than fast enough to keep up. It's only when using bulletin boards, information services, and sending or receiving files that the extra speed comes into play. But, if you have a modem, you'll probably do all of the above.

Here's a relative cost comparison with one sample transaction, which highlights the differences in cost between 300- and 1200-baud modems.

File size: 40K
Number of words: 5,278
Equivalent pages of text: 17
Transmission time @ 300 baud: 24:32 min.
Transmission time @ 1200 baud: 6:38 min.
Zone 2 dialing: @ \$.10 first minute
@ \$.05 each additional minute or fraction.

Cost to send to another microcomputer:
300 baud: \$1.30
1200 baud: \$.40
1200-baud savings: \$.90

Approximate cost of same transaction on CompuServe
300 baud: \$3.80 (\$1.30 + \$2.50)
1200 baud: \$1.90 (\$.40 + \$1.50)
1200-baud savings: \$1.90

If you were to spend 10 hours a month (or 120 hours a year) to send files at these rates, you'd save about \$550 over the course of a year using a 1200-baud rather than 300-baud modem. That's worth thinking about when price-shopping for modems.

—BILL HOWEY

Acoustic couplers, though considered old-fashioned and less efficient than direct-connect modems (because they sometimes allow ambient room noise to creep onto the line), do have one major advantage over direct-connect modems. The couplers can be used in hotel rooms or phone booths, or anywhere phone lines are hard-wired and not connected with detachable modular jacks. Thus, for those on the move, an acoustic coupler might make sense.

Important note: If you have a "call-waiting" feature as part of your phone service, it will wreak havoc with your computer communications. When you're connected to an outside computer, the call-waiting buzz will disconnect the call.

Communications Software. To make a computer work, you need software. A computer will not sing, write your letters, crunch your numbers, or in any way, shape, or form amuse you without software. Alas, the same is true of a modem. Not only does the software have to work with your computer, but it has to work with your specific modem. (See "Tips on Buying Communications Software.") Some of the newer internal modems have "on-board software" built into them (on ROM chips), but most of it is not very powerful.

Many "high-end" manufacturers are also "bundling" full-fledged communications software with their modems (see chart). In many cases, this "free" software could be the determining factor in deciding which modem to buy. The software is designed to work with that particular modem, and may be worth \$75-\$125.

Novation sells the popular *Crosstalk* as part of its Access 1-2-3 package, Hayes bundles various versions of *Smartcom* with its different modems, Prometheus throws in *Mite* with some models, and Microcom includes software with its MacModem. Try out this software. If it's easy for you to use, and does what you want, you're better off buying the package than trying to outfit your modem with software at a later date.

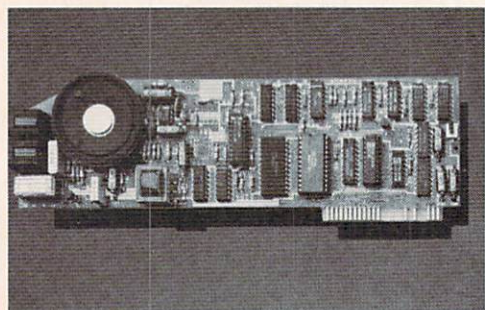
An important point to remember: As with computers, the modem will not be able to do certain things unless the software allows for it. For instance, a modem will not dial numbers from memory unless the software can do it.

FEATURES TO CONSIDER IN A MODEM

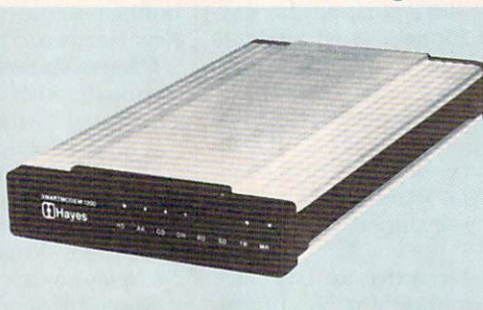
Auto-dial/Auto-redial. To make a call on a manual-dial modem, you must dial a number on the telephone, and wait for the connection. This is marked by a high-pitched telephone tone (and on some modems by the welcoming word, *CONNECT*, on your screen). Such a manual dial method is no great hardship (how hard is it to dial a telephone?), but "auto-dial" modems do have advantages.

For one, you can dial the numbers straight from the keyboard, which means you don't have to switch from phone to keyboard. Second, depending on your software, you usually can store phone numbers in a directory, and dial them automatically with a one- or two-key command.

In addition, with the right software, an auto-dial modem can be programmed to keep redialing a number if it's



Zoom Telephonics' Modem IIc



Hayes Smartmodem 1200



Anchor Automations' Volksmodem 12

300- AND 1200-BAUD MODEMS

| Manufacturer | Model | Price | Baud Rates | Bundled Software ² | Hayes Compatible | Operations ³ | Special Features/Computer Type |
|-------------------|-----------------------------|-------------|------------|--|------------------|-------------------------|--|
| Anchor Automation | Volkmodem | \$79 | 300 | | No | | Voice/data switch; cables for many computers (\$12.95 each) |
| Anchor Automation | Volkmodem 12 | \$299 | 1200/300 | | Yes | AD/AA | Voice/data switch; cables for many computers |
| Anchor Automation | Signalman Mark X | \$169 | 300 | | Yes | AD/AA | RS-232C cable included |
| Anchor Automation | Signalman Mark XII | \$399 | 1200/300 | | Yes | AD/AA | RS-232C cable included |
| Apple Computer | Modem 300 | \$225 | 300 | Apple Term | Yes | AD/AA | IIC or IIE kit; software does not transfer files |
| Apple Computer | Modem 1200 | \$495 | 1200/300 | Apple Term | Yes | AD/AA | IIC or IIE kit; software does not transfer files |
| Atari Computer | 1030 ¹ | est. \$80 | 300 | ModemLink/AMODEM | No | | All Ataris; software does not transfer files |
| Byte-Back Co. | Byte-Back Modem | \$149 | 300 | SpectraTerm or ZCOMM | No | | For Timex computers |
| Cermetek | 1200PC | \$495 | 1200/300 | Crosstalk XVI | Yes | AD/AA | Aux.phone jack; LED bank; IBM |
| Cermetek | 1200 | \$595 | 1200/300 | | Yes | AD/AA | Aux.phone jack; LED bank; \$100 towards software |
| Coleco | ADAMLink Modem ¹ | \$99 | 300 | ADAMLink | No | AD | Internal modem; ADAM only; software does not transfer files |
| Commodore | 1660 Modem/300 | \$99 | 300 | Software | No | AD/AA | C 64, VIC-20, Plus/4, C 16; internal speaker |
| Commodore | VIC Modem | \$79 | 300 | | No | | C 64, VIC-20, Plus/4, C-16; software doesn't transfer files |
| Epson | CR-103 | \$179 | 300 | Modem 103 | Some | AD/AA | For CP/M computers |
| Hayes Products | Smartmodem 300 | \$289 | 300 | | Yes | AD/AA | Internal speaker; LED bank |
| Hayes Products | Smartmodem 300 | \$339 | 300 | Smartcom I | Yes | AD/AA | Internal speaker; Apple IIC cable; LED bank |
| Hayes Products | Smartmodem 1200 | \$699 | 1200/300 | | Yes | AD/AA | Internal speaker; LED bank |
| Hayes Products | Smartmodem 1200B | \$599 | 1200/300 | Smartcom II 2.0 | Yes | AD/AA | Internal modem for IBM PC |
| Hayes Products | Micromodem IIe | \$329 | 300 | Smartcom I | Yes | AD/AA | Internal modem for Apple IIe |
| IBM | PCjr modem | \$199 | 300 | | No | AD/AA | Internal modem for IBM PCjr |
| MFJ Enterprises | MFJ-1237 | \$54 | 300 | | No | | |
| MFJ Enterprises | MFJ-1233 | \$169 | 300 | | No | | TTL and RS-232 input and output |
| Microcom | ERA 2 | \$499 | 1200/300 | ERA 2 | Some | AD/AA | External modem/also internal version for IBM PC |
| Microcom | MacModem | \$599 | 1200/300 | MacModem Software | No | AD/AA | For Apple Macintosh |
| Microperipheral | Autoprint Microconnection | \$179 | 300 | Software | No | AD/AA | Direct connect to Atari and C-64; voice/data switch; Built-in Centronics-parallel port |
| Multi-Tech | MultiModem | \$549 | 1200/300 | | Yes | AD/AA | Stores 6 numbers |
| Mura | MM-100 | \$69 | 300 | | No | AD/AA | For all RS-232 |
| Novation | Apple-Cat 212 | \$319 | 1200/300 | Com-Ware II | No | AD/AA | Internal modem; Apple II plus, IIE only |
| Novation | Smart Cat Plus | \$499 | 1200/300 | Mite | Yes | AD/AA | For IBM, Macintosh, CP/M |
| Novation | Access 1-2-3 | \$599 | 1200/300 | Crosstalk XVI | No | AD/AA | Internal modem for IBM PC |
| Novation | J Cat | \$149 | 300 | | No | AA | For all RS-232 |
| Prentice Corp. | Popcom Pipeline | \$574 | 1200/300 | Pipeline | Yes | AD/AA | For IBM PC |
| Prentice Corp. | Popcom Complete | \$599-\$674 | 1200/300 | PC Complete | Yes | AD/AA | Internal and external versions for IBM PC |
| Prometheus | ProModem 1200 | \$495 | 1200/300 | | Yes | AD/AA | Internal speaker; buffer to 64K; LED bank |
| Prometheus | ProModem 1200A | \$449 | 1200/300 | Built in | Yes | AD/AA | Internal modem for Apple II; real-time clock |
| Prometheus | ProModem 1200B | \$399 | 1200/300 | Mite | Yes | AD/AA | Internal modem for IBM PC |
| Prometheus | ProModem 1200M | \$549 | 1200/300 | ProCom-M | Yes | AD/AA | Software and cable for Apple Macintosh |
| Racal-Vadic | Maxwell 300 | \$350 | 300 | | Yes | AD/AA | Internal modem for IBM PC; external for RS-232 |
| Radio Shack | DC Modem 1 | \$99 | 300 | | No | | For all RS-232 |
| Radio Shack | DC Modem 2 | \$199 | 300 | | No | AD/AA | For all RS-232 |
| Radio Shack | Acoustic Coupler | \$149 | 300 | | No | | For all RS-232 |
| Radio Shack | DC 2212 Modem | \$399 | 1200/300 | | Yes | AD/AA | For all RS-232; LED bank |
| Racal-Vadic | Maxwell 1200 | \$595 | 1200/300 | | No | AD/AA | Internal modem for IBM PC; external for RS-232 |
| Transend Corp. | Apple ModemCard | \$275 | 300 | w/I-Pac (\$339) | No | AD/AA | Internal modem for Apple II |
| U.S. Robotics | Password 300 | \$199 | 300 | | Yes | AD/AA | Internal speaker; for all RS-232 |
| U.S. Robotics | Password 1200 | \$449 | 1200/300 | | Yes | AD/AA | Internal speaker; for all RS-232 |
| Westridge | Westridge 2050 ¹ | \$119 | 300 | M-Term | No | AD/AA | For Timex; software doesn't transfer files |
| Zoom Telephonics | Networker | \$129 | 300 | Zoom Communications; \$50 more for Netmaster | No | | Internal modem for Apple II |
| Zoom Telephonics | Zoom/Modem IIe | \$179 | 300 | as above | Yes | AD/AA | Internal modem for Apple II; speaker |

Notes: ¹Pulse (rotary) dial only; ²Software included with purchase of modem; ³AD = Auto-dial, AA = Auto-answer

PHONE NUMBERS OF MODEM/SOFTWARE MANUFACTURERS

Anchor Automation
(818) 997-7758
Apple Computer
(800) 538-9696
Atari Corp.
(408) 745-4851
Batteries Included
(416) 596-1405
Byte-Back Inc.
(803) 532-5812
Cermetek
Microelectronics
(408) 752-5000
Coleco Industries
(800) 842-1225
Commodore
Business Machines
(215) 431-9100
CompuServe
(800) 848-8990
Code-A-Phone Corp.
(503) 655-8940
Epson America, Inc.
(800) 421-5426

Hayes Microcomputer Products, Inc.
(404) 449-8791
IBM
(305) 272-2662
MFJ Enterprises, Inc.
(601) 323-5869
Microcom Inc.
(617) 762-9310
Microperipheral Corp.
(206) 881-7544
Microstuf
(404) 998-7798
Multi-Tech Systems, Inc.
(612) 631-3550
Mura Corp.
(516) 935-4888
Novation Inc.
(800) 423-5419

Prentice Corp.
(408) 734-9810
Prometheus Products
(415) 490-2370
Racal-Vadic
(408) 946-2227
Radio Shack
(817) 338-2393
Software Publishing Corp.
(415) 962-8910
Transend Corp.
(408) 946-7400
(BBS: 408-946-3616)
Triton Products Co.
(800) 227-6900
United Microware Industries
(714) 639-9396
U.S. Robotics, Inc.
(800) DIAL-USR
Westridge
c/o Anchor Automation
Zoom Telephonics
(800) 631-3116

busy, or if there is no answer. This is particularly useful when you're trying to reach bulletin boards, as many have only one phone line and often are busy.

Auto-answer. This feature allows you to set the modem to automatically answer an incoming phone call. It's a nice feature because answering phone calls manually on the computer can be a little messy. With the right software, auto-answer modems also can be set in a "remote" mode, whereby outside callers can phone your computer and leave messages. If you wish to operate your own bulletin-board system or are running any kind of business, you'll want an auto-answer modem.

Baud Rate. The speed at which a modem sends or receives data is called its baud rate. The most common speeds are 300- and 1200-baud, or bits per second. Three hundred baud is roughly twice as fast as human speech, and transmits a bit more than 300 words (a little more than a typewritten page) a minute. Last year the most common speed was 300-baud; now 1200-baud is becoming accepted as standard; soon, it'll probably be 2400-baud.

A modem that operates at 1200-baud will also operate at 300-baud. This is key, because when communicating with another computer, both modems must be set (some adjust themselves) at the same baud rate. Now, several major manufacturers, such as Hayes, Cermetek, Multi-Tech, and Novation, have introduced 2400-baud modems. These modems, which also send at 1200- and 300-baud, are considerably more expensive (in the \$800-\$1,000 range). Because both modems in a circuit must use the same speed setting, these 2400-baud modems won't be truly useful until enough people have them.

Hayes Compatibility. Hayes is to modems as IBM is to computers—the most prevalent industry standard. Because of this, more software is written to work with Hayes modems than any other kind, and most uses the Hayes commands. And, more modems are made to operate like Hayes modems than any other kind. Thus, buying a modem that uses "Hayes commands" means that you'll have a wider range of software to choose from. You can use software not written for Hayes with a Hayes or Hayes-compatible modem, but it might not work smoothly.

Most Hayes-compatible software is designed primarily for Apple, IBM, or CP/M computers. If you have a Commodore or an Atari, you'll have to spend extra on a cable and interface to connect a Hayes-type modem. You'd spend significantly less buying a made-for-Commodore or made-for-Atari modem, or something like a Volksmodem, for which you can get ready-made Atari or Commodore cables.

LED Indicators/Sound. Communicating via computer can be an abstract experience. It's usually devoid of the color or sound we're accustomed to with TV, telephone, or even most computer software. But some modems have lights and speakers so that you at least know what's going on. The bank of LED lights on some modems might indicate "carrier detect," "auto-answer," etc. A speaker lets you know the phone is ringing when it's busy, and if you've reached a non-working number.


Internal modems, of course, have no lights, but they often come with speakers so you can hear the phone ring.

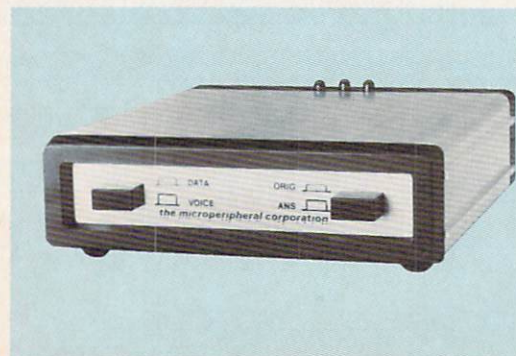
Tone/Pulse. Most modems sold today are capable of dialing over both a touch-tone line and a pulse/rotary line. Some, such as Coleco's ADAMLink and the Atari 1030 Modem, are "pulse only." However, they can still be used with touch-tone phones; the actual dialing will just be slightly slower. Pulse-only phones cannot, in most instances, be used in any kind of tone office phone system, such as a PBX system that requires a "9."

MODEMS: THE GREAT EQUALIZER

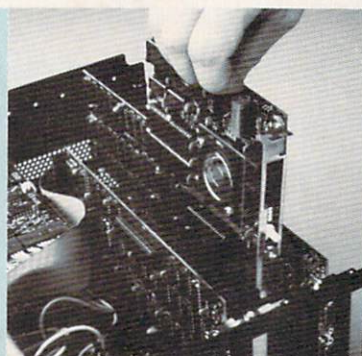
There's another point to keep in mind as far as compatibility goes. You do not have to have the same modem as a friend to communicate. You just have to use the same settings. With the same baud rate, etc., modem X should converse easily with modem Y.

In fact, sending files by modem is a good way to overcome incompatibility problems. For instance, if your Atari word-processing file won't load (and it won't!) in your friend's IBM, or vice versa, just send it by modem. Then the computer on the other end will be able to turn the file into a form it can read.

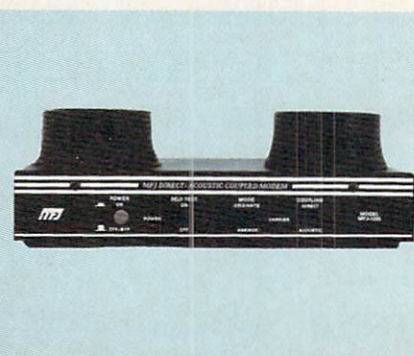
Modems can be the great equalizer. Just as they allow computers with different operating systems to share files, they allow people of different ages, sexes, races, or abilities to communicate with and learn from one another—without bias or convention getting in the way. (See *Editor's Note*, "The Human Connection.") Computer communications, even in their infancy, show great potential. 



Microperipheral's Microconnection



U.S. Robotics' Personal Communicator



MFJ Direct/Acoustic Modem

Tips on Buying Communications Software

BY JOE GELMAN

Your computer and modem offer a world of possibilities. You can communicate with computer systems across the street or halfway around the world. Whether you "travel" first class or coach on the journey depends on the quality of the communications software you use.



Most of the power you'll need when telecomputing is found in the communications software (also called terminal programs), not the modem. Even so-called "intelligent" modems with hefty price tags do little beyond dialing and answering the phone, and managing the transfer of raw data. The important tasks of providing compatibility with other systems, and being able to capture and send text and programs, are the responsibility of the communications software.

Which communications program you select depends on what features you want and which computer you own. For example, while there's only one communications program currently available for the Coleco ADAM computer, Apple II series and IBM PC owners have many to choose from. (See chart for a list of best-sellers and proven performers.)

Most communications programs come in disk format, but there are also cartridge- and/or cassette-based versions for Atari, Timex, TI, TRS-80 CoCo, Commodore 64, and VIC-20 computers. Some computer-specific modems (such as the Atari 1030, and the Networker for the Apple II) contain built-in terminal software (on a chip inside the modem). These programs have limited features but do allow you to communicate. So, it is not necessary to have a tape recorder or a disk drive to operate a modem, though it certainly is preferable.

DUMB VS. SMART SOFTWARE

The job of a communications program is to interpret the data received and transmitted by your modem. At the simplest level, that means displaying characters on your monitor or TV as they are sent or received. Much of the software included free with modems can do this.

"Smart" communications software, which usually comes on disk, can perform more advanced tasks, such as capturing and storing incoming data to disk ("downloading"), or sending a file from your system to another computer ("uploading").

The more sophisticated communications software packages present a bewildering number of options. If you're new to telecomputing, the process of configuring such a program to work with your computer and modem may seem like trial-by-fire. Fortunately, most programs come with default settings that should work most of the time.

CAPTURING DATA

One of the main advantages of owning a modem is being able to download programs and information from other computer systems. If you're like most modem users, you'll be doing a lot of on-line "browsing"—reading messages, bulletins, the news wire, etc. You could be looking for stock quotes on the Dow Jones/News Retrieval Service, or looking for movie reviews on a local BBS (bulletin-board system).

In either case, it's helpful to be able to record information from these explorations in your computer's memory (RAM), in case you want to review or print it out later. To capture this data, you use what is known, in communications parlance, as a "buffer." It is the amount of memory left free by your communications program, and can range from 3K to 70K or more, depending on the program and computer.

You usually can open and close this buffer to incoming information while on-line (while you're connected to another computer). Most communications programs

allow you to print the contents of the buffer, and the good ones also allow you to save it to disk or tape.

Obviously, the bigger the buffer the better, though even the largest buffers will fill up rather quickly. Thus, an important feature to look for in communications software is "auto-save." With this feature, when the buffer fills, its contents automatically are saved to disk. After that, the buffer is empty, ready to receive more data. This fill-and-save process will continue until you tell it to stop, or your disk fills up.

Without auto-save, a buffer once filled will just reject incoming information and send you some kind of distress message, such as BUFFER FULL. Not pleasant.

SENDING/RECEIVING FILES

Sooner or later, you'll want to send and/or receive files. Most bulletin boards and commercial services have free programs that you'll want to download. (In fact, some of the best communications software is in the public domain, i.e. free.) Friends may have written a story or program they want to send you, or vice versa. If you receive files by computer, instead of by mail, you won't have to retype the program or story into your computer!

Whether sending or receiving (uploading or downloading), your communications software must be able to transfer these files cleanly. Phone lines often are "dirty," or subject to noise interference. An erroneous character will cause a captured program to run incorrectly or not at all. To prevent this, many systems use some type of "error-checking protocol" to transfer files.

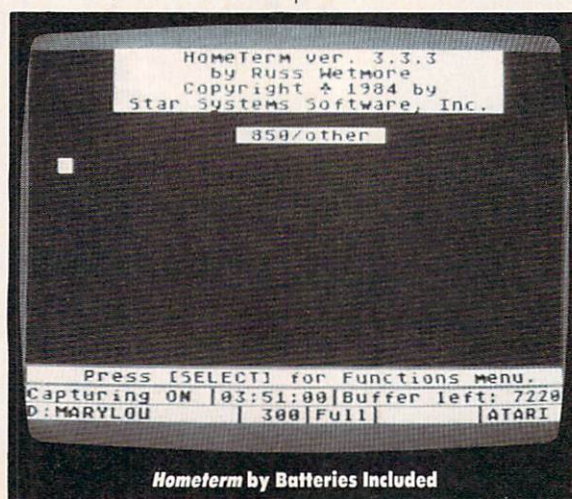
These protocols work only if both the sending and receiving computers are using the same protocol. It's like two baseball managers shaking hands at home plate before a game and agreeing on the ground rules. The use of such protocols is not crucial, but significantly enhances the chances of a safe "send" and "receive." Protocols also can make transferring information from one computer to another automatic and relatively painless.

There are several such protocols. The most widely used is called XMODEM. It was developed in the early days of microcomputer communications by Ward Christensen, whose XMODEM program is perhaps the most famous public-domain program around. (It's been rewritten hundreds of times, and is available for almost every computer.)

XMODEM protocol sends a file in small blocks (128 characters at a time). The sending computer checks with the receiving computer to make sure the data has arrived properly. If the data doesn't match on both sides of the transfer, the block is sent again until it's correctly received. XMODEM will send a block a number of times until it is properly received.

There are other file-transfer protocols, notably CompuServe's 'B' protocol (found in the series of CompuServe *Vidtex* programs) and Hayes verification (used in the Hayes *Smartcom* programs). The problem with the CompuServe B protocol is that CompuServe is the only system that uses it. Similarly, *Smartcom* is the only software that uses the Hayes protocol. So, unless you deal exclusively with CompuServe, or with friends or businesses using *Smartcom*, these two protocols have limited use.

But even CompuServe has jumped on the bandwagon, and now offers its subscribers XMODEM as an option when transferring files. And the new version of



Hayes Smartcom (2.1) software will also include XMODEM as a protocol option. Thus, XMODEM is a good feature to have in communications software, the one caveat being that there are so many versions of it you can't be guaranteed they'll all work together.

PICKING SOFTWARE TO MATCH YOUR MODEM

If you buy a computer with great sound capability, you still need software written to take advantage of it. Otherwise, you'll never hear the beautiful sounds. Similarly, if you've invested in a modem with auto-dial/auto-answer capabilities, make sure that the software you select will take advantage of that power.

A *de facto* standard has emerged, built around the Hayes Smartmodem's set of commands. If both modem and software claim Hayes compatibility, you should have a good match.

Another way to guarantee a "perfect fit" is to buy the modem and communications software as a package. While such a combination provides an easy solution, it limits your selection.

Most communications programs will operate with most modems, but they won't necessarily take full advantage of the modem's power. Even if they do, they may not work smoothly, and will require some ingenuity on the part of the user. Check with the manufacturer first if you're not sure, or if the software package does not have a listing of compatible modems.

SOFTWARE WITH SPEED

If you've invested in a 1200-baud modem instead of the less expensive 300-baud variety, be sure your communications software can handle the higher speed. Also, if you think you might want one of the new 2400-baud modems, the software will have to allow that rate.

Some programs allow speeds up to 38,400 baud, which can be useful for certain types of operations. For instance, you can transfer information between two computers without using either telephone lines or modems. They just have to be in the same room!

You connect the two computers with a "null modem" (available at Radio Shack), a kind of cable that goes from one computer's serial port to the other's. Once connected like this, you can use the communications program in each computer and "pretend" that they are connected by phone! An Atari computer (or any other) can communicate with Radio Shack's TRS-80 Model 100 portable (or any other) when linked by this connecting cable. For anyone operating a small business at home with more than one type of computer, this arrangement is worth looking into.

If you use a modem frequently, and dial the same number over and over, it's nice to store that number in memory and dial it with just one key-stroke. This powerful, time-saving feature is most commonly called a "macro." (Sometimes it goes by a more accessible name, such as "phone directory.") A macro is a string of characters that you create, such as a log-on sequence to an information service (phone number, account number, password). You can store these phone numbers and log-on sequences permanently on the program disk. Then, when you want to dial, a keystroke or two will execute the macro, automatically typing the characters you told it to. To do this, your modem must have auto-dial ca-

pability, and your software must have macros.

Sophisticated programs such as *Crosstalk* let you create "scripts" that will log onto a system, download specific information (such as stock quotations), save it to disk, and log-off, all without your intervention. Ed Juge, director of market planning at Radio Shack, has written a short public-domain program (available on CompuServe) that tells his TRS-80 Model 100 to dial CompuServe, check his e-mail box, download any messages, and sign off.

While certainly not a necessity, the ability to create macros of this sort is a nice feature to have in your communications software. They do the *Yellow Pages* one better and save your fingers from walking.

ON-LINE PRINTING

Some programs can print out the text you see on the screen when you're connected to another computer. On-line printing (sometimes referred to as "print-spooling") is a handy feature to have when you want a quick copy of a message, or when you sign on to a new system and merely want a printout of the menu or HELP screen to aid your navigation. And, for those times when you're not sure your computer is saving the precious material you see on the screen, the steady clackety-clack of your printer (and the sight of hard copy) is reassuring.

Most programs that don't have simultaneous printing will let you, nonetheless, print out the contents of the buffer, or print once you've saved to tape or disk. It requires some extra steps, but it's not a big inconvenience.

THE WORD-PROCESSING CONNECTION

For many people, sending text they've prepared with a word-processing program via computer is the primary use for their modem. But often, there are problems with this seemingly simple transaction.

Usually, the fault lies with a word-processing program. To send text files to another computer, you should store your word-processing files in "text format," or "ASCII format." (ASCII is a standard code used by computers to represent characters.) However, not all word-processing programs can save files in ASCII format.

For example, IBM word-processing programs store files in ASCII format. So does Apple's *AppleWriter*. Apple's *AppleWorks* and Broderbund's *Bank Street Writer* store files in "binary format," but they can be converted to ASCII. Electronic Arts' *Cut & Paste* files cannot be converted into ASCII format. And so it goes.

Consult your word-processing manual, or check with the software company, to see if your word-processing program can save files in ASCII format. (If it can't, you may be able to find utility programs that can convert your word-processing files to ASCII.) If you are shopping for a new

word-processing program, and expect to use it with a modem, check if the program has the ability to save an ASCII version of a file.

In some cases, word-processing and communications software use the term "print to disk" to signify ASCII storage. This means that your computer pretends it's sending data to a printer, but actually sends it to the disk drive (in ASCII format).

THE WRITER'S BLEND

There's a new breed of program on the market that integrates word processing and communications. *Skiwriter* (for Commo-



dore 64 by Prentice-Hall), *AppleWriter II* (for the Apple II series by Apple Inc.), *Symphony* (for IBM PC by Lotus Development Corp.), *Get Organized!* (for IBM PC by Electronic Arts), and *Hometerm* (for Atari, Apple, Commodore 64, and planned for IBM PCjr, from Batteries Included) are examples. With such programs, you can prepare text, go on-line, and transmit the text, all from one program.

Some of the better (and more expensive) communications programs, such as *ASCII Express* (for Apple II series and IBM PC by United Software), have built-in text editors. These editors do not rank as full-fledged word processors, but are useful for writing short notes, or cleaning up a file you've downloaded before printing it out.

SPECIAL FEATURES

There are some special software features that can make using your modem more enjoyable. If you use the conferencing or CB feature of CompuServe, or operate in a similar on-line environment where the words of several people appear on the screen at once, a "type-ahead window" gives you more flexibility. This window appears at the bottom of the screen and is a reserved area of two or three lines where you can type your next comment. Your text isn't sent until you press ENTER (or RETURN), and doesn't interfere with the incoming information, so you can continue to read on-screen what others are saying.

A real-time clock display is useful for keeping track of your on-line time. Programs such as *Hometerm* and *Personal Communications Manager* (for IBM PC and PCjr, by Microcom) display a running clock on the screen. This feature may save you from spending the rent money on an information service!


With menu-driven software, you can execute various tasks by choosing options. This type of software is generally easier to learn and use than command-driven software, which requires you to remember a long list of commands to type in. The latter can be a problem unless you have a good memory and use the software often. With some software, however, you can choose between menus or commands. If you plan to use the software often and are confident in your ability with a computer, look for software with this option. Operating with commands is cleaner and quicker than using menus.

"TEST DRIVE" BEFORE BUYING

If at all possible, try to test communications software before you buy. Make sure it has the features you want and isn't too difficult to use. You should be able to change settings quickly and easily. Opening and closing the buffer should be as convenient as possible, preferably using a single keystroke. You should be able to tell quickly how easy it is to navigate.

For example, when on-line, you may have to experiment with the duplex setting from time to time. There are two types of duplex: full and half. If the system you've called "echoes" your characters, you'll want to be in full duplex. If there's no echo, set your software to half duplex so you can see your own typing. If you're set to half duplex and receive an echo, you'll see a doubling of letters (e.g., HHEELLPP). The cure is to switch to full duplex. Some programs allow you to change settings easily (*Hometerm*, *ASCII Express*), while others (such as *Apple Access* and *Personal Communications Manager*) require you to travel through a series of menus.

HAPPY TRAILS

Getting a modem and communications software to work well together can be a nettlesome affair, though it's getting easier all the time. Stick with it and dream of that first magic moment when you've dialed and see on your screen the words, "WELCOME TO MCI MAIL," or "CONNECT." 

COMMUNICATIONS SOFTWARE

| SYSTEM | NAME/ COMPANY/PRICE | FILE TRANSFER | BUFFER SIZE | MACRO | MAX. BAUD | SIMUL. PRINTOUT |
|-------------------------------------|---|------------------|------------------|-------|--------------|--------------------|
| ADAM | | | | | | |
| ADAM | ADAMLink (D/T) Coleco Industries Under \$100; w/modem | N ¹ | 8K | N | 300 | N |
| APPLE II | | | | | | |
| IIe/e | Vidtex CompuServe \$39.95 | B | 12K | N | 9600 | N |
| II plus/e/e | ASCII Express United Software \$129.95 | X | 24K | Y | 9600 | Y |
| II plus/e/e | Netmaster 2.0 Zoom Telephonics \$69 | S | 42K | N | 9600 | N |
| II plus/e/e | Hometerm ² Batteries Included \$49.95 | X | 9K | Y | 1200 | N |
| IIe/e | Apple Access Apple Inc. \$75 | X | 3K | Y | 9600 | N |
| IIe/e (128K) | pfs: Access Software Publishing \$70 | A | 32K | N | 1200 | Y |
| ATARI | | | | | | |
| 32K | AMODEM 6.0 Public domain | X | 12K | N | 1200 | N |
| 48K | Hometerm ² Batteries Included \$49.95 | X | 7K | Y | 1200 | N |
| COMMODORE | | | | | | |
| C 64 | Vidtex (D/T) CompuServe \$39.95 | B | 30K | Y | 600 | N |
| C 64 | Hometerm ² Batteries Included \$49.95 | X | 11K | Y | 1200 | N |
| C 64 | XMODEM 64 Public domain | X | 21K | N | 300 | N |
| RADIO SHACK | | | | | | |
| Color Computer 32K | Vidtex (D/T) CompuServe \$39.95 | B | 12K | Y | 600 | N |
| Model III 48K | Vidtex CompuServe \$39.95 | B | 23K | Y | 19200 | Y |
| IBM | | | | | | |
| PC & PCjr (128K) | Vidtex Professional Connection CompuServe \$59.95 | B | 16K | Y | 1200 | Y |
| PC & PCjr (128K) | ASCII Express United Software \$189.95 | X | 28K | Y | 38400 | Y |
| PC only (192K) | Smartcom 2.0 Hayes Inc. \$149 | S | 4K | Y | 1200 | Y |
| PC & PCjr (96K) | Crosstalk XVI ³ Microstuf \$195 | X | 66K | Y | 9600 | Y |
| PC & PCjr (128K) | Personal Communi- cations Manager IBM \$100 | S | N/A | Y | 9600 | Y |
| PCjr (128K) | pfs: Access Software Publishing \$95 | A | 32K | Y | 1200 | Y |
| TI-99/4A | | | | | | |
| Expansion Box and RS-232 Card | Emulator II Triton Products \$19.95 | S | 2K | N | 300 | N |
| TIMEX/SINCLAIR | | | | | | |
| 16K TS 1000/1500 | ZCOMM 16/64K (T) \$149 (\$119 kit) with Byte-Back Modem | S | 15-60 Screens | N | 300 | Y |
| TS2068 | Spectra Term w/Byte-Back | S | 30K | N | 300 | Y |

¹New version will support downloading

²Part of Homepak (word processor, data base, communications program)

³CP/M version available; N/A = Information not available

N = None; B = B Protocol; X = XMODEM; S = Special; A = Text (ASCII) only

T = Tape; C = Cartridge; D = Disk; Unless noted, all programs are disk only

B A S I C B O O T H



"Wendell, please stop referring to our relationship as a 'glitch-free, elegant solution.' "

Computer Vacations

YOUR FAMILY DOESN'T HAVE TO TRAVEL TO JACKSON HOLE, WYOMING, TO LEARN ABOUT COMPUTERS—BUT IT SURE IS MORE FUN THAN STAYING HOME

BY
MINDY PANTIEL
AND
BECKY PETERSEN

Everyone else seems to be learning about computers—the kids, your neighbors, even your mother-in-law. But you? Well, you've been meaning to tackle that users' manual. You keep planning to take a course after work. You're embarrassed to admit that you still do your taxes with a legal pad and a calculator. You're even willing to admit to your kids that you need help figuring out that word-processing program. But there never seems to be enough time.

You stare at the computer. It stares back at you. You wonder if your kids will let you monopolize the machine long enough to master it. You wonder if there's a better way.

The Williams family of Cody, Wyoming, thinks there is a better way. Last spring, the four of them piled into the family Jeep and headed for Jackson Hole, a resort community near Yellowstone National Park and the Grand Teton mountain range. Jackson Hole is known for its breathtaking scenery, exhilarating mountain trails, white-water rafting, and trout fishing. The travel guides don't mention computers.

But now, the Personal Computing Resort in Jackson Hole has joined the growing number of family vacation spots that offer an extra dividend—computers. While a resort vacation is generally an expensive endeavor, families around the country have found that mixing computer learning with recreational activities can be doubly rewarding. You have lots of fun—as you would on any family vacation—but you also get to learn together and take home a new understanding of computers. And, as an added bonus, it's possible that part of the cost of these educational computer vacations might be tax deductible. Be sure to check with your tax accountant.

Here's how the Williamses approached computer learning as a group—how they made their decision to take a vacation in Jackson

Hole, and what they learned while they were there. (See accompanying box for a list of other computer vacation spots.)

MIXING LEARNING WITH FUN

When Mark Williams purchased a computer, he had high expectations. He planned to use it in the office of his insurance business during the week, and bring it home on weekends. He figured his family—wife Cheryl, and sons Timothy, age 16, and Jeremy, age 8—would quickly discover all sorts of educational and household applications to make the investment worthwhile. And, he just assumed that before long he'd be tackling such things as spreadsheets and text editors with ease.

Weeks went by and the Williamses' IBM PC was starting to gather dust. The family barely touched it, and Mark began to question the wisdom of his purchase. A busy work schedule left little spare time for teaching himself about computing, and the machine just wasn't making it home on the weekends.

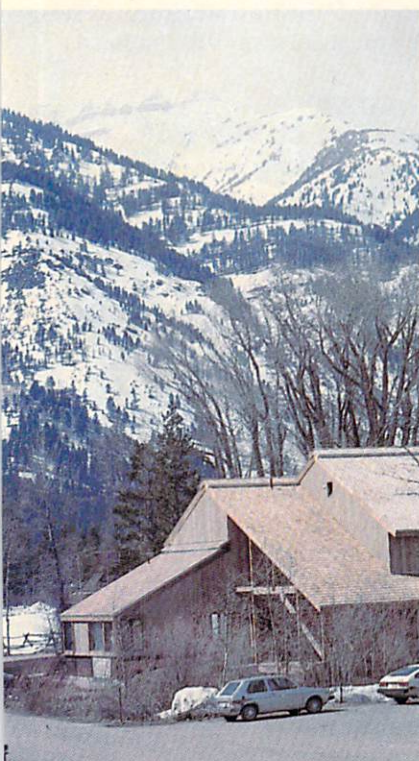
Finally, Mark enrolled in a computer class at the local college. The course served as a good introduction to basic terms, but it lacked the hands-on problem-solving he sorely needed. His high hopes had just about hit rock bottom when he spotted a brochure at a local computer store for the Personal Computer Resort—on its cover was the alluring invitation to get "personal computer instruction in an alpine paradise."

The area had always been a favorite vacation spot for the Williams family. Mark didn't need a computer to figure out that a trip to Jackson Hole might be a perfect way to combine a little business with pleasure. The family could go skiing and snowmobiling by day and learn how to use their computer in the evening. Assuming the idea would unanimously thrill the Williams clan, Mark made the necessary arrangements, and headed home to announce the trip.

MINDY PANTIEL and BECKY PETERSEN are contributing editors for FAMILY COMPUTING. Last month they completed a six-part series on Logo.



The Williams family—Timothy, Cheryl, Mark, and Jeremy—heads out for a day on the Jackson Hole ski slopes before an evening of computer classes. Below left, a scenic view of the resort; right, skiers are now students practicing on their IBM computers.



NOT SO FAST

Timothy thought it sounded great. A sophomore in high school, he'd had some experience with Apple computers in his math class, had learned a little programming, and was eager to expand his knowledge.

Jeremy had used a computer only a few times in his third-grade class, but knew there were lots of things he loved to do in Jackson Hole. He was all for it.

So far, so good. Then, Cheryl responded to her husband's enthusiasm with three words: "Cancel the plans!" She bluntly informed the rest of the family that she had no intention of taking precious vacation days to learn about computers. The whole idea was out of the question.

Mark was crestfallen. He tried everything he could think of to convince Cheryl. But her decision was probably made when she eyed the three members of her family, all with pleading looks on their faces, and realized she had no hope. She finally agreed to take the time off from her job as office manager of a chiropractor's office, and—after considerable nudging—consented to sign up for the classes.

LEARNING ABOUT COMPUTERS AND LIKING IT!

A Quick Guide to Some of the Exciting Locations Where Your Family Can Enjoy Computing

Jackson Hole, Wyoming, is just one of many destinations you and your family can consider for a computer vacation. There are exotic Caribbean getaways, ocean cruises, and ski resorts—all offering computer classes as a bonus. To help guide you, we've briefly described some computer vacations that may be of interest; but remember—new places and ideas crop up all the time! Talk to your travel agent or check with your local computer store to keep up to date.

The Travel Shoppe

2311 Santa Clara Ave.
Alameda, CA 94501
(415) 865-5542 or (415) 521-8231

This August you can sail around the beautiful Hawaiian Islands—and when it gets cloudy, you can head for a computer! The *S.S. Independence* departs from Waikiki Beach for a seven-day computer-seminar cruise featuring Commodore 64s. Cruises start at \$1,690 per person/per week—that includes food, lodging, courses, and airfare from San Francisco.

Club Med

3 E. 54th St.
New York, NY 10022
(800) 528-3100

Club Med members can get hands-on experience with Atari computers at 11 Club Med Villages worldwide. Prices, which include all your expenses, range this spring from \$650 to \$900 per person/per week.

Sesame Place

100 Sesame Road, Box 579
Langhorne, PA 19047
(215) 752-4900

How about a computer vacation just for the kids? Sesame Place, an educational theme park inspired by the popular "Sesame Street" TV show, offers a summer computer day camp for youngsters. The fee is approximately \$175 per child/per week. Sesame Place also has computer courses for adults. A wide variety of topics is covered—from an introduction to micros to programming in BASIC. Prices vary: Single classes can range from \$4.25 to \$15. Full-range courses are about \$160.

Cunard

555 Fifth Ave.
New York, NY 10017
(212) 661-7777

If you've always wanted to travel on the QE2, you can choose anything from a luxurious cruise around the world to a three-day excursion from Manhattan to Long Island Sound. Computer instruction is provided on all trips. Prices vary greatly: The three-day cruise starts at \$295 per person. The cost can go as high as \$87,045 for a trip around the world.

The Village at Smuggler's Notch

Smuggler's Notch, VT 05464
(802) 644-8851

For serious computer fans, a New England destination may be the ideal vacation spot. The recently established Smuggler's Notch Foundation for Computer Use is aimed at developing computer literacy in a relaxed atmosphere. It runs a special program just for families to compute together. Prices vary for midweek and weekend stays, approximately \$384 and \$264 per person respectively, for lodging and computer instruction.

Personal Computer Resort

Star Route, Box 362A
Jackson, WY 83001
(800) 443-8616 or (307) 733-3990

Guests at Jackson Hole can take advantage of a variety of recreational activities, as well as attend computer classes taught on IBM PCs. Prices vary, but their special lodging/computer school package costs \$699.

Two resorts in the beautiful Catskill Mountains of New York have run computer seminars in the past—and there's a good possibility that they will offer them again. For more information, contact the **Fallsview Hotel** at (212) 947-4428 and **Grossinger's** at (800) 874-7480 (within New York state), (800) 431-6300 (outside of New York). **Royal Viking Cruises** also offered computer workshops on several previous trips, and may have plans for this season. To check, contact Viking Line 1, One Embarcadero Center, San Francisco, CA 94111; or call (800) 422-8000.

—SUZETTE HARVEY

MAKING IT ALL WORTHWHILE

By the time the family Jeep pulled up in Jackson Hole several weeks later, Cheryl had begun to soften—a bit. She decided that as long as she was going to be there, she'd try to make the most of it. "I guess I needed to learn to appreciate computers and have some knowledge of them because my children will be using them," she said. "Also, the doctor and I had talked about using a computer. We see as many

as 50 people a day and it would certainly help with billing and book work."

The general philosophy at the resort is to encourage guests to learn about computing without sacrificing opportunities to enjoy the splendors of Jackson Hole. Another goal is to provide a comfortable, nonthreatening atmosphere for those first approaching the subject. It's not hard to succeed at both: The computer classes are held in a cozy environment with six IBM PCs set up at tables facing huge picture windows on either side. Through the windows, guests are reminded that they're a stone's throw from one of the most naturally beautiful places in the country. And, located within walking distance of the Williamses' condo was not only the computer lab, but a health club complete with racquetball courts, swimming pool, weight room, hot tubs, and aerobic classes. An outdoor pool and tennis courts were just around the corner. (It was admittedly just such amenities that lured Cheryl to consent to a computing vacation.)

Pat Going, one of the owners of the resort, understands guests like Cheryl. "We want people to have a good time while they're here—as well as have the chance to learn computing." By scheduling computer classes for the late afternoon and evenings, "students have the better part of the day to ski, snowmobile, or just take in the sights," he explained.

During the next few days Mark, Cheryl, and Timothy would receive 18 hours of computer instruction on IBM PCs, the same kind of computer they had at home. The course introduces students to the basics, as well as the rudiments of word processing, and applications software like spreadsheets. Jeremy was welcome to attend any of the sessions, but, with the exception of the introductory slide show, most of the material was over his head.

"I NEVER REALIZED WHAT A COMPUTER COULD DO"

Sharon Boren, a local schoolteacher who's designed a computer-education curriculum, taught all of the computer sessions. Her credentials are good: Three of her computer-specific textbooks have been published, and she teaches graduate-level computer-education courses during the summer. Most of her students are husband-and-wife teams with little or no computing background. In fact, many echo stories similar to the Williamses'—they bought a computer, but just aren't using it.

Sharon started the ball rolling with a general overview of the history of micros. From there the 12 students, assigned two to a computer, were offered immediate hands-on experience. By evening's end, everyone had loaded and run some simple programs and typed in a program in BASIC.

Mark and Timothy were looking forward to more advanced applications. For Cheryl, the introductory class proved its worth. "I never

realized all the things the computer could do. Now I'm curious about ways to use it at the office," she said.

On the second evening, after the Williamses had spent a day on the ski slopes, the class focused on spreadsheets, using *SuperCalc II* (they now use *Lotus 1-2-3*). Sharon carefully explained all the commands and led the class step-by-step through a break-even analysis. Then the students were encouraged to try to work with a spreadsheet on their own. "We like to see people take off with a practical approach and do things that are pertinent to their own lives," she explained. "Most people do things like work on their household budgets, but some students get really creative."

Among the more imaginative were Mark and Timothy, who used the opportunity to do some cost projections on banana sales, hardly a growing concern in Cody, Wyoming. The two still managed to learn a great deal about the usefulness and power of spreadsheets while having a laugh or two along the way. Even though Mark had owned a spreadsheet for months, this was the first time he had actually solved a problem with one. Banana sales aside, he was starting to see several uses for this application in his insurance business.

Cheryl was a little lost at this point, so Sharon worked one-on-one with her for a while. By evening's end, Cheryl figured out how a spreadsheet could be used in setting up a household budget, although she claimed to need no electronic assistance in that area.

DEAR GRANDMA

The next night the class concentrated on word processing with *Wordix*, *Edix*, and *Spellix* software. After mastering the basics, once again students were encouraged to try their hand at a newly acquired skill. Cheryl and Timothy teamed up to write to his grandmother.

Together the mother-son team composed a long letter, detailing their trip to Jackson Hole. "We purposely made lots of mistakes along the way so we would have lots of things to correct using the word-processing package," explained Cheryl. With the project completed and corrected, Cheryl and Timothy used the commands they had learned to print it out. In addition to personal letter writing, Cheryl could see all sorts of applications for word processing in her job, especially for correspondence and late billing notices.

JUST A LITTLE MORE PRACTICE

By the final session, the same 12 people who entered the condominium-turned-classroom just four days earlier had changed dramatically. No longer in awe, they approached the computers with confidence, and even enthusiasm. At this point Sharon believed her students were ready for a challenge. She handed them a problem that demanded the use of

TIPS FOR FINDING THE RIGHT FAMILY COMPUTING VACATION

The idea of a family computing holiday is gaining momentum. Besides just getting away, there is the added incentive of an educational experience. For the family that is now starting to compute, it can be a great way to spend time together while developing a solid background in computer skills. Use the following questions as a guide to checking out the computing vacation that's right for you.

1. What Kinds of Computers Are Used? If you only want to train on the same type of computer you use at work or home, you may find yourself somewhat limited. For learning the basics, just about any machine will do, but make sure applications that can be used on *your* machine are part of the curriculum.

2. Is There a Good Computer-Student Ratio? For the best experience, there should be no more than two students to a computer. To guarantee a good student-teacher ratio, there should be no more than 20 students in a class.

3. Are There Classes for Students of All Ages? Look for resorts that offer computing classes for everyone in your family. If the classes are more suited to older students, see that there are other activities appropriate for younger family members.

4. What About Hands-on Experience? Ask to see a course outline before signing up. Lecturing should be kept to a minimum, and hands-on experience should be the main part of the course. Look for problem-solving opportunities—they really enhance the learning process.

5. Who Are the Teachers? Don't hesitate to ask for credentials. You want someone with a solid background in computers. If the instructors have certified teaching experience, so much the better. Often, classroom teachers do a much better job of presenting complex material than someone with just a technical background.

6. Are There Lots of Recreational Facilities? Remember, this is a vacation, and above all you want to have fun. The resort you choose should have lots of activities that are of interest to your whole family. —M.P. AND B.P.


SuperCalc, *Wordix*, and *Edix* to complete successfully.

It's usually with a great deal of personal satisfaction that the students carry the problem through to its logical conclusion. Every one of them—some initially eager, others somewhat resistant—succeeds in doing what he or she came to do: spend some time on the slopes, practice some racquetball moves, and learn about computers.

A FEELING OF ACCOMPLISHMENT

The vacation was a different experience for each member of the Williams clan. Mark gained the knowledge to put his computer to good use. The college class had been a good beginning, but the problem-solving nature of this course gave him the additional boost he was looking for. "Now I know I'll use my PC a lot more. It will be great for keeping track of office expenses, forecasting, and record-keeping."

Timothy, who only got to use the computer "once in a while" in school, welcomed the opportunity to use the computer on a regular basis. Spreadsheets were new to him, and he liked being a little ahead of the game. He also enjoyed the immediate attention and reinforcement that only an intimate classroom setting can provide.

And Cheryl, who had seriously considered staying home, was delighted with what she learned, and hopes to use a computer on the job. She was happily able—and willing—to learn in a supportive and comfortable environment. 

HELPFUL HINTS

TRICKS AND GADGETS FOR IDYLIC COMPUTING

EDITED
BY ROXANE
FARMANFARMAIAN

Your computer is worth its weight in gold—you find it a useful tool and a time-saver, and your kids like it, too. But at times, its stubbornness overwhelms you—the printer ribbon runs dry (again), the paper jams, the screen gets the flickers—and you wonder, “Can’t there be a better (or cheaper) way?” This is the first in a series of helpful hints to ease life with your computer. Future issues will contain some money-savers and some short, short programs to make your computing experience even more pleasant. Many of them are offered by our readers; others are based on our experiences at FAMILY COMPUTING.

Hook Up Your Computer to the TV Without Interference.

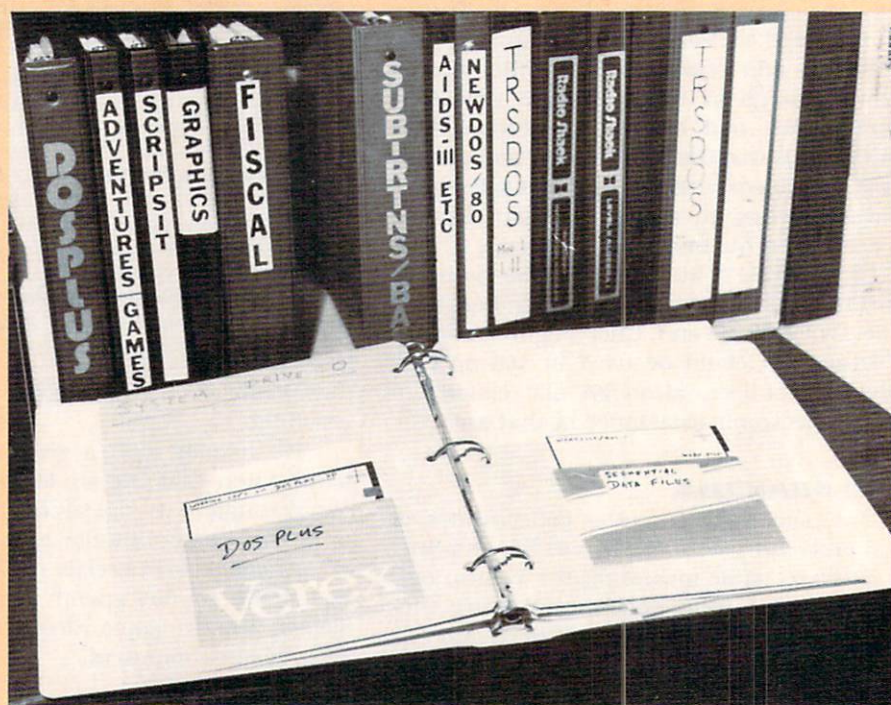
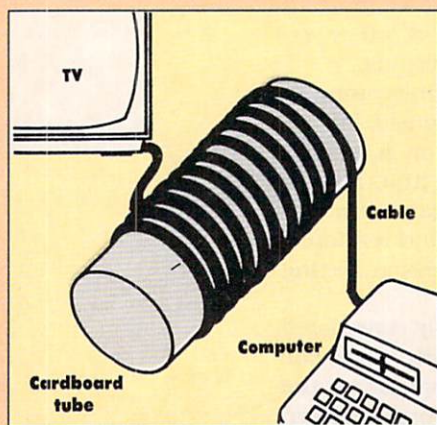
Your TV works fine. So does your computer. But connect one to the other and your screen display goes haywire.

A cheap and easy solution: Replace the cable that connects the TV to the computer with another that’s the same type but long enough to allow for 24 inches of slack. Wind it in a coil around a cardboard tube (such as a paper towel core) until you reach 10 or more turns (see diagram). Make sure the turns are even and tightly spaced, and lie flat (don’t overlap one turn of the cable onto another). Wrap a sturdy layer of tape or foil around the coil to prevent it from coming unwound.

Place the coil near the back of the TV next to the antenna lead-in terminals. Connect the ends of your cable to the TV and computer in the usual manner.

Voilà! The coil acts as a directional antenna, which you can aim to minimize the effects of broadcast interference. You will have to play with the angle to perfect the screen display.

DALE MANN
Jacksonville, Florida



Custom-Design Your Disk-File Library.

The computer’s still humming along fine, but little by little its space is being inundated by stacks of disks, program listings, documentation, printouts, etc. It’s time to organize a software library. An efficient method is to use three-ring looseleaf binders and double-pocket dividers. A separate binder should be used for each program (or related programs) and should contain not only the system and data disks, but all associated material. You will need a minimum of two dividers for each binder.

You can use the first divider—on the right-hand side of the binder—to store the current index to the entire file. This index can include a topic summary, the name of the program, names given to accompanying data

disks, and disk ID numbers. On the flip side of the divider, tape the sides and bottom of the system-disk envelope to the outside of the pocket and place the disk in the envelope. Program listings, documentation notes, a printout of the disk directory, etc. can go into the pocket.

Use the second divider to file the first data disk, mounted in its envelope on the pocket. Place any hard copies, notes, etc. into the pocket.

As the quantity of data and disks using a particular program increases, you easily can add more dividers to the binder. You can also use vinyl sleeves, which fit two disks. Program listings and other material can be punched to fit the binders and inserted after the data disks.

JAMES E. HENRY
Camden, South Carolina

Avoid Wavy Lines on Your C 64 Screen.

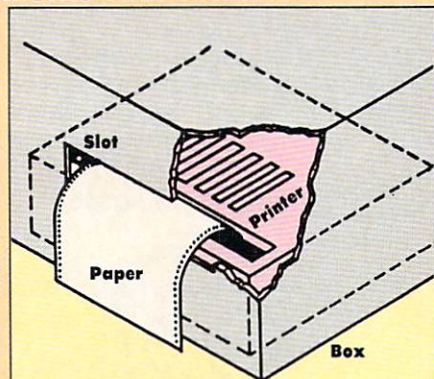
You're happily sitting at your C 64, computing away, and suddenly you see ripples going up your screen at approximately one-second intervals. It's not the first time you've been subjected to this aquarium effect, and the only relief you've found so far has been to turn off your computer and wait awhile. The cause? Recent C 64s contain a number of plastic video chips rather than ceramic ones, and when they overheat, they send wavy lines up your screen. Try placing a small desk fan next to your computer, and direct the air current across the back of the computer console. This usually cools the system sufficiently to avoid the ripple effect.

Make Short Shrift of Disk or Cassette I/O Errors.

When you try to load from your disk or cassette, do you sometimes get a very disconcerting message the likes of: I/O ERROR ON DRIVE 1, OR DISK DRIVE EMPTY, OR FILE NOT FOUND, when you know files are on that disk? Or even worse, do you find that your computer is locking up? The culprit might be electromagnetic interference (EMI) emitted by your TV's flyback transformer, which could affect the information recorded (magnetically) on your disk or cassette.

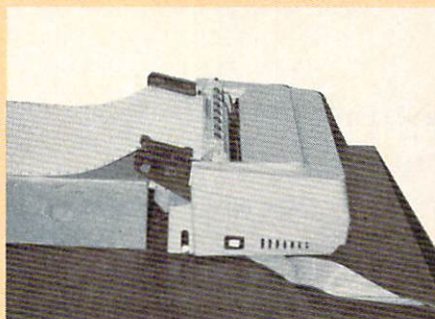
The solution's simple: The flyback transformer usually is on the left side of your TV, so move your disk drive(s) or cassette recorder over to the right side. If that's out of the question, make sure your drive(s) or recorder is at least six inches away from the TV. For ADAM and PCjr owners, distancing your TV or monitor is particularly important since your computers lack internal shielding to protect them from EMI.

Muffle That Printer!



Feed Your Fanfold Paper Without a Catch.

If your continuous-feed, fanfold paper turns in upon itself when you're printing, or otherwise jams



up due to tension or twisting, here's a home remedy that should get it flowing like greased lightning in less than 10 minutes. Remove the paper from the box. Cut one of the short ends and both longer sides so they are only about 4 inches deep. Next, completely cut away the box's other short end, making sure the edges are smooth; the hole should measure approximately 10 inches across.

Place your paper on the table behind your printer and load it. Turn the box upside down and place it over the paper with the open end next to the printer. Arrange the paper leaving the printer to feed across the top of the box.

NEIL LEWBEL
Stamford, Connecticut

Computer Plus VCR: Tips For a Mix.

If you own a computer and a VCR, the possibilities for combining the two for applications that extend beyond their individual capabilities are myriad (check with your dealer to find out whether your two pieces of equipment are electronically compatible). Plug your computer into the RCA plug on the incoming switch side of the VCR. Set the computer, VCR, and TV to the same channel.

For a test run, LOAD a short program or game into the computer. Adjust the brightness and contrast knobs on your TV screen to get a perfect picture. RUN the program, or play a few minutes of the game, recording it all the while on your VCR. When you play it back, experiment with the VCR's fast forward/reverse capabilities. Plug a microphone into one of the jacks and, while the tape is running, record a little speech about the game's strategy, or, if your stereo is close by, record some background music to accompany the program. When you rerun the "sound and screen" tape you've just produced, use the VCR's stop option, LOAD a word-processing program into your computer, and record a screen of notes. The result will be an annotated tape of the program, which you can play on your VCR.

By mixing the media capabilities of a computer and VCR, you can create flexible and interesting applications for educational purposes, archiving, demo work, visuals editing, etc. Classroom or business presentations, for example, can be reduced to tapes of whatever computer programs, listings, or graphics you wish to use, accompanied by sound and large-screen capabilities. No more lugging around of heavy equipment, no more embarrassing on-the-spot glitches or lockups. Or, children can tape their best gaming moments or strategies and take them to friends' homes without worrying about software compatibility between different computers.

ROBERT GREEN
Clarkston, Georgia

HAVE A HINT?

We will pay \$25 for every hint (we've never heard of) which we publish. Please keep them short (not more than 300 words) and enclose diagrams or photos, if applicable. Send to: *Helpful Hints*, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. FAMILY COMPUTING cannot assume responsibility for the loss or return of any material.

BEFORE YOU BUY A PRINTER, TAKE THIS SIMPLE EYE TEST.

This is from a leading
computer printer.

This is from the new GE TXP-1000.



LETTER-QUALITY PRINTING. GREAT-LOOKING GRAPHICS.

As you can see, the General Electric Printer is easy on the eyes. In fact, you'll have to look high and low to find a printer that gives you better quality printing and clearer graphics for the money. It has two speeds and uppercase and lowercase characters. It prints U.S., scientific and international characters in three widths, too. And it'll give you some of

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Watch. It's fast, flexible and quiet.

It's easy to see the versatility in the GE Printer. You'll get high-quality print-outs at two speeds on virtually any paper. And it's quiet, too. So it's a silent partner for any computer.

See, it's compatible with Commodore, Apple, IBM, Atari:

The GE Printer is fully compatible with most home computer systems. So it's easy to live with.

A full line of peripherals worth more than a glance.

Whether it's a GE Modem with direct or acoustic operation, a GE Computer Monitor/TV with resolution that offers superior text and graphics or even the GE Program Recorder, it'll be one of the best connections

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GE gives you a two-year warranty on its printer, and should you have any questions, you can always call the GE Answer Center,™ 1-800-626-2000 toll-free and get help right away. And all our peripherals are backed by General Electric's reliability and service. The GE Computer Printer. A beautiful sight.

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the PROGRAMMER

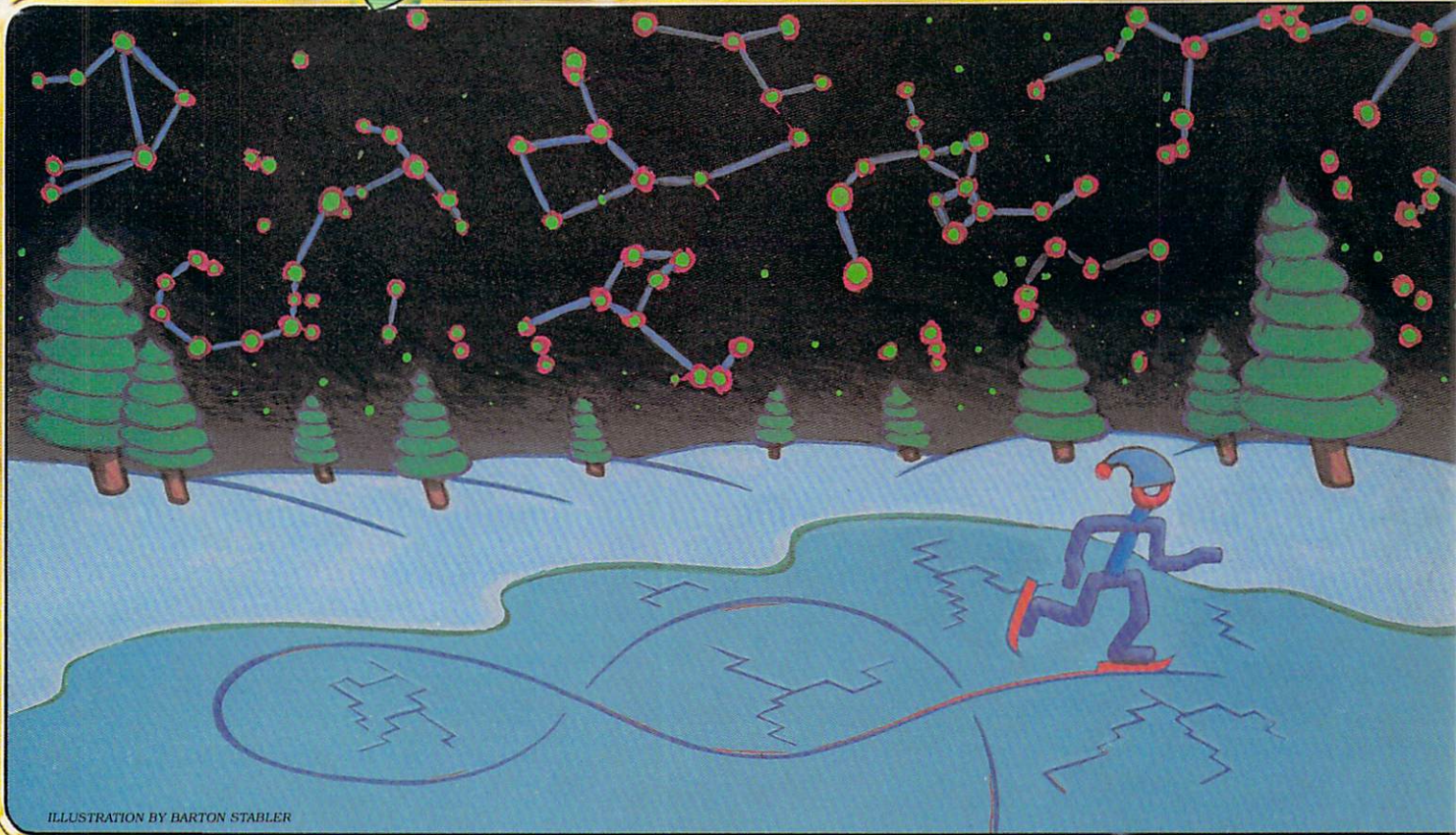


ILLUSTRATION BY BARTON STABLER

| ★ | M | A | R | C | H | ★ |
|---|---|--|---|---|---|---|
| BEGINNER PROGRAM Page 44 Scan the skies with <i>Zodiac</i> — <i>without</i> getting a crick in your neck! | | ARCADE GAME Page 59 It's been a great winter for skating— but don't you think it's getting a bit <i>warm</i> ? Real arcade action and sound. Play at your own risk! | | FEATURE PROGRAM Page 62 You don't have to be a programming pro to create professional-looking graphics on your C 64. | | |
| PROGRAMMING P.S. Notes about previous months' programs. Page 64 | | | | | | |

ILLUSTRATION BY JIM CHERRY III

Cherry

ZODIAC

BY JOHN JAINSCHIGG

When people ask "What's your sign?" they're talking astrology—a mystical discipline based on the astronomy of the sun and local constellations. The 12 constellations of the zodiac appear to lie along a ribbon of sky, called the ecliptic, that encircles the Earth. As Earth moves through its orbit in the course of the year, the sun appears to move along this corridor and through the constellations, one by one.

The ancients tried to use their knowledge of the sun and stars to predict earthly events—and many people today still believe in the power of the constellations to influence human affairs. But even if you don't believe in astrology, the forms of the constellations, their names, and their histories are fascinating. To help you with your stargazing, we've created *Zodiac*, a program that will show you what these constellations look like in the sky. It'll also teach you their names, their brightest stars, and the days of the year when the sun seems to travel through them. Then, if you like, it'll quiz you on what you've learned!

(Note: The dates tradi-



tionally used by astrologers are slightly different from the astronomically correct dates used in this program. Between November 30 and December 19, the sun appears to travel through the constellation Ophiuchus, which is not part of the astrological zodiac.)

ADAM/Zodiac

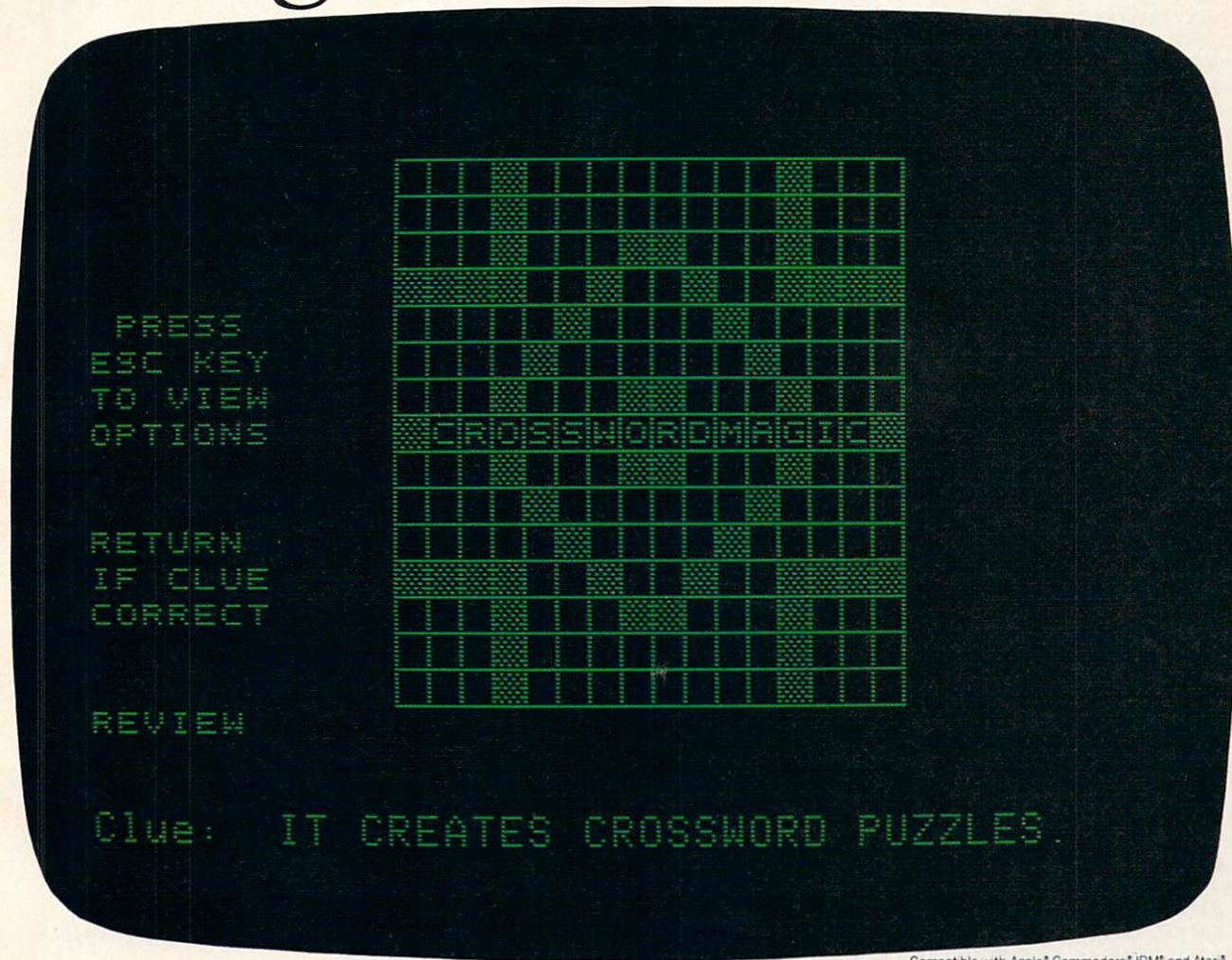
```
10 DIM na$(12),bs$(12),dt$(12,2),sn(12),str(12,18)
20 FOR x=1 TO 12
30 READ na$(x),bs$(x),dt$(x,1),dt$(x,2),sn(x)
40 FOR y=1 TO sn(x)
50 READ str(x,y)
60 NEXT y,x
70 HOME
80 PRINT TAB(13);"ZODIAC"
90 PRINT
100 PRINT "PRESS <V> TO VIEW THE"
110 PRINT "CONSTELLATIONS OF THE ZODIAC,"
120 PRINT "<Q> FOR A QUICK QUIZ,"
130 PRINT "OR <E> TO END THE PROGRAM."
140 GET k$
150 IF k$="E" OR k$="e" THEN END
160 IF k$<>"V" AND k$<>"Q" THEN 140
170 z=(k$="Q")
180 sc=0
190 FOR i=1 TO 12
200 IF z THEN x=INT(RND(1)*12)+1:GOTO 330
210 x=i
220 HOME
230 PRINT "THE SUN IS IN THE"
```

```
240 PRINT "CONSTELLATION ";na$(x)
250 PRINT "BETWEEN ";dt$(x,1);" AND ";dt$(x,2);"."
260 PRINT
270 PRINT na$(x);"'S BRIGHTEST STAR IS"
280 PRINT bs$(x);"."
290 PRINT
300 PRINT "PRESS ANY KEY TO"
310 PRINT "VIEW ";na$(x);"."
320 GET k$
330 HOME
340 FOR y=1 TO sn(x)
350 q=INT(str(x,y)/31)
360 HTAB str(x,y)-q*31+1
370 VTAB q+1
380 PRINT CHR$(42+37*(y=1));
390 NEXT y
400 FOR d=1 TO 3000
410 NEXT d
420 IF NOT z THEN 550
430 HOME
440 PRINT "WHAT CONSTELLATION"
450 INPUT "WAS THAT?";r$
460 IF r$=na$(x) THEN sc=sc+1:PRINT "RIGHT!":GOTO 480
470 PRINT "NO, IT WAS ";na$(x);"."
480 PRINT "WHAT IS ITS"
490 INPUT "BRIGHTEST STAR?";r$
500 IF r$=bs$(x) THEN sc=sc+1:PRINT "RIGHT!":GOTO 520
510 PRINT "NO, IT IS ";bs$(x);"."
520 PRINT
530 PRINT "PRESS ANY KEY TO CONTINUE."
540 GET k$
550 NEXT i
560 IF NOT z THEN 70
570 HOME
580 PRINT "YOUR SCORE WAS ";sc;" OUT OF 24."
590 PRINT "THAT'S ";INT((sc/24)*100);" PERCENT CORRECT"
600 PRINT
610 PRINT "PRESS ANY KEY TO CONTINUE."
620 GET k$
630 GOTO 70
1000 DATA CAPRICORN,ALGEDI,1/20,2/18,13,121,213,335
1010 DATA 579,639,574,508,412,285,318,322,326,208
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,80,336,637
1030 DATA 138,13,74,72,315,625,715,373,372
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,620,562,563,504
1050 DATA 505,508,516,550,643,677,585,521,438,287,196
1060 DATA 133,70,10
1070 DATA ARIES,HAMAL,4/19,5/15,7,482,609,671,283,268
1080 DATA 107,48
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,265,174,237
1100 DATA 298,331,8,126,460,513,580,677,463,557
1110 DATA GEMINI,CASTOR,6/21,7/21,16,75,77,22,174,397
1120 DATA 495,587,233,232,292,228,382,512,578,739,735
1130 DATA CANCER,BETA CANCRI,7/21,8/11,5,739,50,329
1140 DATA 453,698
1150 DATA LEO,REGULUS,8/12,9/16,14,580,741,426,360,236
1160 DATA 55,119,153,731,687,504,497,318,351
1170 DATA VIRGO,SPICA,9/21,11/1,12,668,567,458,430,370
1180 DATA 245,246,331,143,419,353,345
1190 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,296,42,224
1200 DATA 634,658,720
1210 DATA SCORPIO,ANTARES,11/23,11/30,15,329,269,56
1220 DATA 119,274,367,359,450,512,573,694,659,532,470
1230 DATA 411
1240 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,229,41,289
1250 DATA 294,266,383,422,239,485,487,576,670,659,687
```

Apple/Zodiac

```
10 DIM na$(12),bs$(12),dt$(12,2),sn(12),str(12,18)
20 FOR x = 1 TO 12
30 READ na$(x),bs$(x),dt$(x,1),dt$(x,2),sn(x)
40 FOR y = 1 TO sn(x)
50 READ str(x,y)
60 NEXT y,x
```


Only one program lets you create your own crossword, instead of filling in someone else's.



Compatible with Apple,* Commodore,* IBM* and Atari.*

Crossword Magic is just like the crossword puzzles you see in the newspaper. It has the same crossword format. And the same crossword clues.

Yet, it's totally unique. (After all, does it make sense to spend \$49.99 for something you get in your newspaper for a few cents?)

Here's the twist.

Crossword Magic lets you create your own puzzles from scratch. Not only is this fun, but it's also educational. You can use it to test yourself and others on any subject. For example, will they remember that a "protozoan with pseudopodia" is an amoeba?

Now *that's* worth \$49.99.

Crossword Magic from Mindscape



Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062. For more information, call 1-800-221-9884. In Illinois: 1-800-942-7315. Price listed is manufacturer's suggested retail price.

BEGINNER PROGRAM

```

70 HOME
80 PRINT TAB(17);"ZODIAC"
90 PRINT
100 PRINT "PRESS <V> TO VIEW THE"
110 PRINT "CONSTELLATIONS OF THE ZODIAC,"
120 PRINT "<Q> FOR A QUICK QUIZ,"
130 PRINT "OR <E> TO END THE PROGRAM.";
140 GET K$
150 IF K$ = "E" THEN END
160 IF K$ <> "V" AND K$ <> "Q" THEN 140
170 Z = (K$ = "Q")
180 SC = 0
190 FOR I = 1 TO 12
200 IF Z THEN X = INT(RND(1)*12)+1:GOTO 310
210 X = I
220 HOME
230 PRINT "THE SUN IS IN THE CONSTELLATION"
240 PRINT NAS(X);" BETWEEN ";DT$(X,1);" AND ";DT$(X,2)";
250 PRINT
260 PRINT NAS(X);"'S BRIGHTEST STAR IS"
270 PRINT BS$(X);"."
280 PRINT
290 PRINT "PRESS ANY KEY TO VIEW ";NAS(X);"."
300 GET K$
310 HOME
320 FOR Y = 1 TO SN(X)
330 Q = INT(STR(X,Y)/40)
340 HTAB STR(X,Y)-Q*40+1
350 VTAB Q+1
360 PRINT CHR$(42+85*(Y = 1));
370 NEXT Y
380 FOR D = 1 TO 3000
390 NEXT D
400 IF NOT Z THEN 530
410 HOME
420 PRINT "WHAT CONSTELLATION"
430 INPUT "WAS THAT?";R$
440 IF R$ = NAS(X) THEN SC = SC+1:PRINT "RIGHT!":GOTO 460
450 PRINT "NO, IT WAS ";NAS(X);"."
460 PRINT "WHAT IS ITS"
470 INPUT "BRIGHTEST STAR?";R$
480 IF R$ = BS$(X) THEN SC = SC+1:PRINT "RIGHT!":GOTO 500
490 PRINT "NO, IT IS ";BS$(X);"."
500 PRINT
510 PRINT "PRESS ANY KEY TO CONTINUE."
520 GET K$
530 NEXT I
540 IF NOT Z THEN 70
550 HOME
560 PRINT "YOUR SCORE WAS ";SC;" OUT OF 24."
570 PRINT "THAT'S ";INT((SC/24)*100);" PERCENT CORRECT"
580 PRINT
590 PRINT "PRESS ANY KEY TO CONTINUE."
600 GET K$
610 GOTO 70
1000 DATA CAPRICORN,ALGEDI,1/20,2/18,13,156,275,432
1010 DATA 747,825,740,655,531,368,410,415,421,269
1020 DATA AQUARIUS,SADALMEIK,2/17,3/13,12,103,433
1030 DATA 822,178,17,95,93,407,807,922,481,480
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,800,725,727,650
1050 DATA 652,655,666,710,830,874,755,672,565,370,253
1060 DATA 172,90,13
1070 DATA ARIES,HAMAL,4/19,5/15,7,622,786,866,365,346
1080 DATA 138,62
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,342,224,306
1100 DATA 384,427,10,163,593,662,748,873,598,719
1110 DATA GEMINI,CASTOR,6/21,7/21,16,97,99,29,224,512
1120 DATA 639,757,300,299,377,294,493,661,746,954,949
1130 DATA CANCER,BETA CANCRI,7/21,8/11,5,954,64,425
1140 DATA 584,900
1150 DATA LEO,REGULUS,8/12,9/16,14,749,956,550,464
1160 DATA 305,71,153,197,943,887,650,641,410,453
1170 DATA VIRGO,SPICA,9/21,11/1,12,862,732,591,555

```

```

1180 DATA 455,445,478,318,317,427,185,541
1190 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,382,54
1200 DATA 289,818,849,929
1210 DATA SCORPIO,ANTARES,11/23,11/30,15,425,347,72
1220 DATA 154,353,473,463,581,660,739,895,850,687,607
1230 DATA 530
1240 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,296,53,373
1250 DATA 379,343,494,544,308,626,628,743,865,850,886

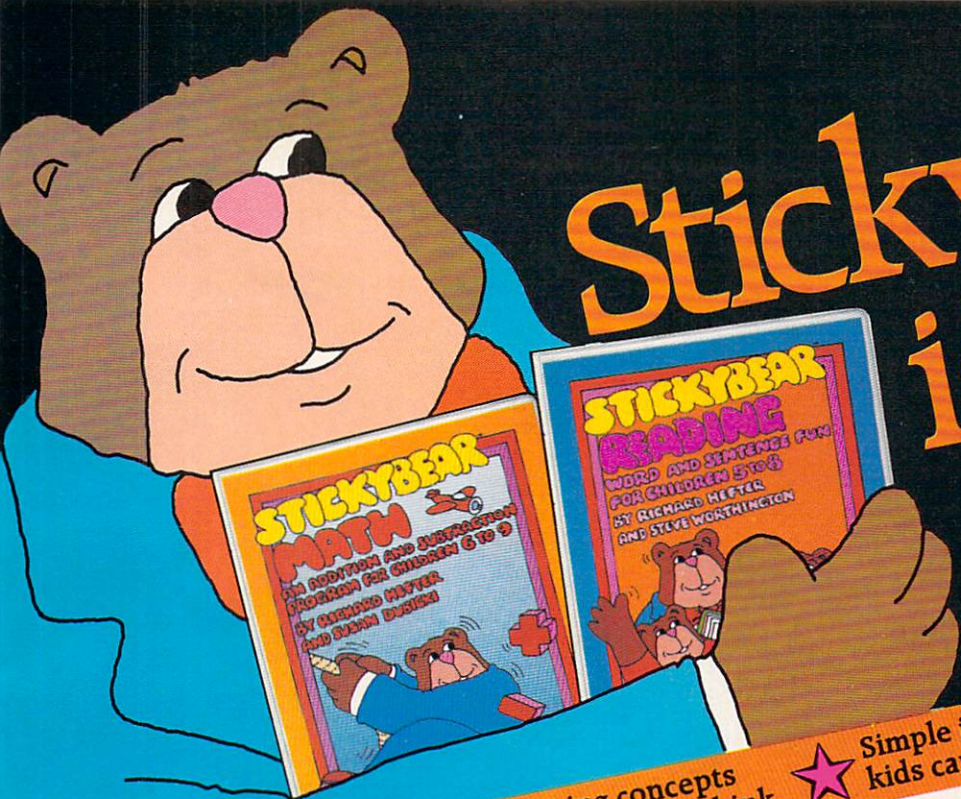
```

Atari/Zodiac

```

10 DIM NAMS(77),BST$(93),DAT$(160),R$(20),NAM(13),BST(
13),DAT(13),STN(12),STR(12,18)
20 OPEN #1,4,0,"K:"
30 SETCOLOR 2,0,0
40 POKE 752,1
50 FOR X=1 TO 12
60 READ R$
70 NAM(X)=LEN(NAMS)+1
80 NAMS(NAM(X))=R$
90 READ R$
100 BST(X)=LEN(BST$)+1
110 BST$(BST(X))=R$
120 READ R$
130 DAT(X)=LEN(DAT$)+1
140 DAT$(DAT(X))=R$
150 READ A
160 STN(X)=A
170 FOR Y=1 TO A
180 READ B
190 STR(X,Y)=B
200 NEXT Y
210 NEXT X
220 NAM(13)=LEN(NAMS)+1
230 DAT(13)=LEN(DAT$)+1
240 BST(13)=LEN(BST$)+1
250 PRINT CHR$(125)
260 POSITION 18,0:PRINT "ZODIAC"
270 POSITION 2,5:PRINT "PRESS <V> TO VIEW THE"
280 PRINT "CONSTELLATIONS OF THE ZODIAC,"
290 PRINT "<Q> FOR A QUICK QUIZ,"
300 PRINT "OR <E> TO END THE PROGRAM.";
310 GET #1,K
320 IF K=ASC("E") THEN END
330 IF K<>ASC("V") AND K<>ASC("Q") THEN 310
340 Z=(K=ASC("Q"))
350 SC=0
360 FOR I=1 TO 12
370 IF Z THEN X=INT(RND(0)*12)+1:GOTO 480
380 X=I
390 PRINT CHR$(125);
400 PRINT "THE SUN IS IN THE CONSTELLATION"
410 PRINT NAMS(NAM(X),NAM(X+1)-1);" BETWEEN ";DAT$(DAT
(X),DAT(X+1)-1);"."
420 PRINT
430 PRINT NAMS(NAM(X),NAM(X+1)-1);"'S BRIGHTEST STAR I
S"
440 PRINT BST$(BST(X),BST(X+1)-1);"."
450 PRINT
460 PRINT "PRESS ANY KEY TO VIEW ";NAMS(NAM(X),NAM(X+1
)-1);".";
470 GET #1,K
480 PRINT CHR$(125)
490 FOR Y=1 TO STN(X)
500 Q=INT(STR(X,Y)/40)
510 POSITION STR(X,Y)-Q*40,Q:PRINT CHR$(42+22*(Y=1));
520 NEXT Y
530 FOR D=1 TO 1000
540 NEXT D
550 IF NOT Z THEN 710
560 PRINT CHR$(125);
570 PRINT "WHAT CONSTELLATION"
580 PRINT "WAS THAT?";
590 INPUT R$
600 IF R$=NAMS(NAM(X),NAM(X+1)-1) THEN SC=SC+1:PRINT "
RIGHT!":GOTO 620

```

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A/MO1AM22

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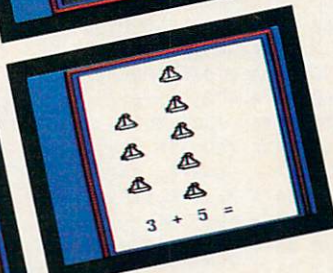
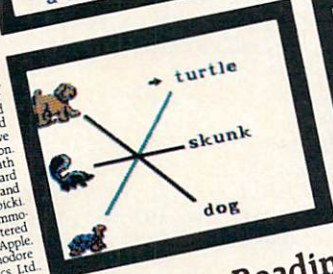
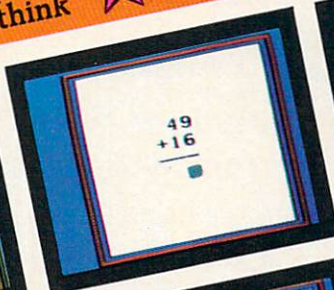
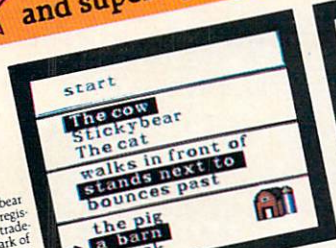
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Weekly Reader Family Software

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BEGINNER PROGRAM

```

610 PRINT "NO, IT WAS ";NAM$(NAM(X),NAM(X+1)-1);"."
620 PRINT "WHAT IS ITS"
630 PRINT "BRIGHTEST STAR";
640 INPUT RS
650 IF RS=BST$(BST(X),BST(X+1)-1) THEN SC=SC+1:PRINT "
RIGHT!":GOTO 670
660 PRINT "NO, IT IS ";BST$(BST(X),BST(X+1)-1);"."
670 PRINT
680 PRINT "PRESS ANY KEY TO CONTINUE."
689 REM --CLEAR KEYBOARD BUFFER--
690 POKE 764,255
700 GET #1,K
710 NEXT I
720 IF NOT Z THEN 250
730 PRINT CHR$(125);
740 PRINT "YOUR SCORE WAS ";SC;" OUT OF 24."
750 PRINT "THAT'S ";INT((SC/24)*100);" PERCENT CORRECT
"
760 PRINT
770 PRINT "PRESS ANY KEY TO CONTINUE."
780 GET #1,K
790 GOTO 250
1000 DATA CAPRICORN,ALGEDI,1/20 AND 2/18,13,156,275
1010 DATA 432,747,825,740,655,531,368,410,415,421,269
1020 DATA AQUARIUS,SADALMELIK,2/17 AND 3/13,12,103,433
1030 DATA 822,178,17,95,93,407,807,922,481,480
1040 DATA PISCES,ALRISCHA,3/13 AND 4/19,18,800,725,727
1050 DATA 650,652,655,666,710,830,874,755,672,565,370
1060 DATA 253,172,90,13
1070 DATA ARIES,HAMAL,4/19 AND 5/15,7,622,786,866,365
1080 DATA 346,138,62
1090 DATA TAURUS,ALDEBARAN,5/14 AND 6/21,13,342,224
1100 DATA 306,384,427,10,163,593,662,748,873,598,719
1110 DATA GEMINI,CASTOR,6/21 AND 7/21,16,97,99,29,224
1120 DATA 512,639,757,300,299,377,294,493,661,746,954
1130 DATA 949
1140 DATA CANCER,BETA CANCRI,7/21 AND 8/11,5,954,64
1150 DATA 425,584,900
1160 DATA LEO,REGULUS,8/12 AND 9/16,14,749,956,550,464
1170 DATA 305,71,153,197,943,887,650,641,410,453
1180 DATA VIRGO,SPICA,9/21 AND 11/1,12,862,732,591,555
1190 DATA 478,318,317,427,185,541,455,445
1200 DATA LIBRA,ZUBEN ELGENUBI,11/1 AND 11/22,6,382,54
1210 DATA 289,818,849,929
1220 DATA SCORPIO,ANTARES,11/23 AND 11/30,15,425,347
1230 DATA 72,154,353,473,463,581,660,739,895,850,687
1240 DATA 607,530
1250 DATA SAGITTARIUS,NUNKI,12/19 AND 1/19,14,296,53
1260 DATA 373,379,343,494,544,308,626,628,743,865,850
1270 DATA 886

```

Commodore 64/Zodiac

```

10 DIM NAS(12),BS$(12),DT$(12,2),SN(12),STR(12,18)
20 POKE 53280,0
30 POKE 53281,0
40 FOR X=1 TO 12
50 READ NAS(X),BS$(X),DT$(X,1),DT$(X,2),SN(X)
60 FOR Y=1 TO SN(X)
70 READ STR(X,Y)
80 NEXT Y,X
90 PRINT CHR$(147);
100 PRINT TAB(17);CHR$(5);"ZODIAC"
110 PRINT
120 PRINT "PRESS <V> TO VIEW THE"
130 PRINT "CONSTELLATIONS OF THE ZODIAC,"
140 PRINT "<Q> FOR A QUICK QUIZ,"
150 PRINT "OR <E> TO END THE PROGRAM.";
160 GET K$
170 IF K$="E" THEN END
180 IF K$("<V" AND K$("<Q" THEN 160
190 Z=(K$="Q")
200 SC=0
210 FOR I=1 TO 12
220 IF Z THEN X=INT(RND(1)*12)+1:GOTO 340
230 X=I

```

```

240 PRINT CHR$(147);
250 PRINT "THE SUN IS IN THE CONSTELLATION"
260 PRINT NAS(X);" BETWEEN ";DT$(X,1);" AND ";DT$(X,2)
;"."
270 PRINT
280 PRINT NAS(X);" IS BRIGHTEST STAR IS"
290 PRINT BS$(X);"."
300 PRINT
310 PRINT "PRESS ANY KEY TO VIEW ";NAS(X);"."
320 GET K$
330 IF K$="" THEN 320
340 PRINT CHR$(147);
350 FOR Y=1 TO SN(X)
360 POKE 1024+STR(X,Y),42-(39*(Y=1))
370 POKE 55296+STR(X,Y),1
380 NEXT Y
390 FOR D=1 TO 3500
400 NEXT D
410 IF NOT Z THEN 550
420 PRINT CHR$(147);
430 PRINT "WHAT CONSTELLATION"
440 INPUT "WAS THAT";RS
450 IF RS=NAS(X) THEN SC=SC+1:PRINT "RIGHT!":GOTO 470
460 PRINT "NO, IT WAS ";NAS(X);"."
470 PRINT "WHAT IS ITS"
480 INPUT "BRIGHTEST STAR";RS
490 IF RS=BS$(X) THEN SC=SC+1:PRINT "RIGHT!":GOTO 510
500 PRINT "NO, IT IS ";BS$(X);"."
510 PRINT
520 PRINT "PRESS ANY KEY TO CONTINUE."
530 GET K$
540 IF K$="" THEN 530
550 NEXT I
560 IF NOT Z THEN 90
570 PRINT CHR$(147);
580 PRINT "YOUR SCORE WAS ";SC;" OUT OF 24."
590 PRINT "THAT'S ";INT((SC/24)*100);" PERCENT CORRECT."
600 PRINT
610 PRINT "PRESS ANY KEY TO CONTINUE."
620 GET K$
630 IF K$="" THEN 620
640 GOTO 90
1000 DATA CAPRICORN,ALGEDI,1/20,2/18,13,156,275,432
1010 DATA 747,825,740,655,531,368,410,415,421,269
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,103,433
1030 DATA 822,178,17,95,93,407,807,922,481,480
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,800,725,727,650
1050 DATA 652,655,666,710,830,874,755,672,565,370,253
1060 DATA 172,90,13
1070 DATA ARIES,HAMAL,4/19,5/15,7,622,786,866,365,346
1080 DATA 138,62
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,342,224,306
1100 DATA 384,427,10,163,593,662,748,873,598,719
1110 DATA GEMINI,CASTOR,6/21,7/21,16,97,99,29,224,512
1120 DATA 639,757,300,299,377,294,493,661,746,954,949
1130 DATA CANCER,BETA CANCRI,7/21,8/11,5,954,64,425
1140 DATA 584,900
1150 DATA LEO,REGULUS,8/12,9/16,14,749,956,550,464
1160 DATA 305,71,153,197,943,887,650,641,410,453
1170 DATA VIRGO,SPICA,9/21,11/1,12,862,732,591,555
1180 DATA 455,445,478,318,317,427,185,541
1190 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,382,54
1200 DATA 289,818,849,929
1210 DATA SCORPIO,ANTARES,11/23,11/30,15,425,347,72
1220 DATA 154,353,473,463,581,660,739,895,850,687,607
1230 DATA 530
1240 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,296,53,373
1250 DATA 379,343,494,544,308,626,628,743,865,850,886

```

IBM PCs/Zodiac

```

10 DIM NAS(12),BS$(12),DT$(12,2),SN(12),STR(12,18)
20 WIDTH 40
30 KEY OFF
40 RANDOMIZE
50 FOR X=1 TO 12

```


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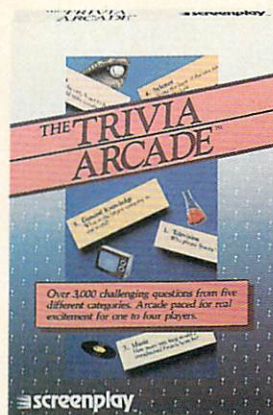
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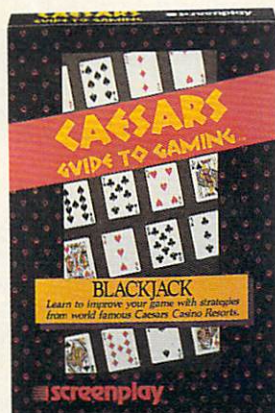


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BEGINNER PROGRAM

```

60 READ NAS(X),BS$(X),DT$(X,1),DT$(X,2),SN(X)
70 FOR Y=1 TO SN(X)
80 READ STR(X,Y)
90 NEXT Y,X
100 CLS
110 PRINT TAB(18);"ZODIAC"
120 PRINT
130 PRINT "PRESS <V> TO VIEW THE"
140 PRINT "CONSTELLATIONS OF THE ZODIAC,"
150 PRINT "<Q> FOR A QUICK QUIZ,"
160 PRINT "OR <E> TO END THE PROGRAM.:"
170 K$=INKEY$
180 IF K$="E" THEN END
190 IF K$("<V") AND K$("<Q") THEN 170
200 Z=(K$="Q")
210 SC=0
220 FOR I=1 TO 12
230 IF Z THEN X=INT(RND(1)*12)+1:GOTO 330 ELSE X=I
240 CLS
250 PRINT "THE SUN IS IN THE CONSTELLATION"
260 PRINT NAS(X);" BETWEEN ";DT$(X,1);" AND ";DT$(X,2)
;".
270 PRINT
280 PRINT NAS(X);"'S BRIGHTEST STAR IS"
290 PRINT BS$(X);"."
300 PRINT
310 PRINT "PRESS ANY KEY TO VIEW ";NAS(X);"."
320 IF INKEY$="" THEN 320
330 CLS
340 FOR Y=1 TO SN(X)
350 Q=INT(STR(X,Y)/40)
360 LOCATE Q+1,STR(X,Y)-Q*40+1:PRINT CHR$(42+27*(Y=1))
;
370 NEXT Y
380 FOR D=1 TO 2500
390 NEXT D
400 IF NOT Z THEN 530
410 CLS
420 PRINT "WHAT CONSTELLATION"
430 INPUT "WAS THAT?":RS
440 IF RS=NAS(X) THEN SC=SC+1:PRINT "RIGHT!":GOTO 460
450 PRINT "NO, IT WAS ";NAS(X);"."
460 PRINT "WHAT IS ITS"
470 INPUT "BRIGHTEST STAR?":RS
480 IF RS=BS$(X) THEN SC=SC+1:PRINT "RIGHT!":GOTO 500
490 PRINT "NO, IT IS ";BS$(X);"."
500 PRINT
510 PRINT "PRESS ANY KEY TO CONTINUE."
520 IF INKEY$="" THEN 520
530 NEXT I
540 IF NOT Z THEN 100
550 CLS
560 PRINT "YOUR SCORE WAS";SC;"OUT OF 24."
570 PRINT "THAT'S";INT((SC/24)*100);"PERCENT CORRECT."
580 PRINT
590 PRINT "PRESS ANY KEY TO CONTINUE."
600 IF INKEY$="" THEN 600 ELSE 100
1000 DATA CAPRICORN,ALGEDI,1/20,2/18,13,156,275,432
1010 DATA 747,825,740,655,531,368,410,415,421,269
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,103,433
1030 DATA 822,178,17,95,93,407,807,922,481,480
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,800,725,727,650
1050 DATA 652,655,666,710,830,874,755,672,565,370,253
1060 DATA 172,90,13
1070 DATA ARIES,HAMAL,4/19,5/15,7,622,786,866,365,346
1080 DATA 138,62
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,342,224,306
1100 DATA 384,427,10,163,593,662,748,873,598,719
1110 DATA GEMINI,CASTOR,6/21,7/21,16,97,99,29,224,512
1120 DATA 639,757,300,299,377,294,493,661,746,954,949
1130 DATA CANCER,BETA CANCRI,7/21,8/11,5,954,64,425
1140 DATA 584,900
1150 DATA LEO,REGULUS,8/12,9/16,14,749,956,550,464
1160 DATA 305,71,153,197,943,887,650,641,410,453
1170 DATA VIRGO,SPICA,9/21,11/1,12,862,732,591,555
1180 DATA 455,445,478,318,317,427,185,541

```

```

1190 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,382,54
1200 DATA 289,818,849,929
1210 DATA SCORPIO,ANTARES,11/23,11/30,15,425,347,72
1220 DATA 154,353,473,463,581,660,739,895,850,687,607
1230 DATA 530
1240 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,296,53,373
1250 DATA 379,343,494,544,308,626,628,743,865,850,886

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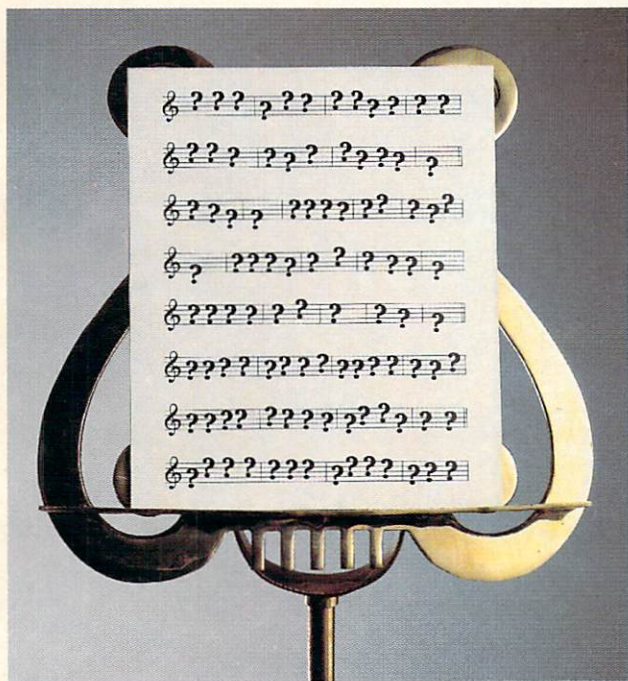
TI-99/4A/Zodiac

```

10 DIM NAS(12),BS$(12),DT$(12,2),SN(12),STR(12,18)
20 RANDOMIZE
30 CALL SCREEN(2)
40 FOR X=1 TO 8
50 CALL COLOR(X,16,1)
60 NEXT X
70 FOR X=1 TO 12
80 READ NAS(X),BS$(X),DT$(X,1),DT$(X,2),SN(X)
90 FOR Y=1 TO SN(X)
100 READ STR(X,Y)
110 NEXT Y
120 NEXT X
130 CALL CLEAR
140 PRINT TAB(12);"ZODIAC"
150 PRINT
160 PRINT "PRESS <V> TO VIEW THE"
170 PRINT "CONSTELLATIONS OF"
180 PRINT "THE ZODIAC,"
190 PRINT "<Q> FOR A QUICK QUIZ,"
200 PRINT "OR <E> TO END THE PROGRAM."
210 CALL KEY(3,K,S)
220 IF K("<V") THEN 240
230 END
240 IF (K("<Q"))*(K("<E")) THEN 210
250 Z=(K("<Q"))
260 SC=0
270 FOR I=1 TO 12
280 IF Z=0 THEN 310
290 X=INT(RND*12)+1
300 GOTO 440
310 X=I
320 CALL CLEAR
330 PRINT "THE SUN IS IN THE"
340 PRINT "CONSTELLATION ";NAS(X)
350 PRINT "BETWEEN ";DT$(X,1);" AND ";DT$(X,2);"."
360 PRINT
370 PRINT NAS(X);"'S BRIGHTEST STAR"
380 PRINT "IS ";BS$(X);"."
390 PRINT
400 PRINT "PRESS ANY KEY"
410 PRINT "TO VIEW ";NAS(X);"."
420 CALL KEY(3,K,S)
430 IF S=0 THEN 420
440 CALL CLEAR
450 FOR Y=1 TO SN(X)
460 Q=INT(STR(X,Y)/32)
470 CALL HCHAR(Q,STR(X,Y)-Q*32+1,42-37*(Y=1),1)
480 NEXT Y
490 FOR D=1 TO 1400
500 NEXT D
510 IF Z=0 THEN 710
520 CALL CLEAR
530 PRINT "WHAT CONSTELLATION"
540 INPUT "WAS THAT?":RS
550 IF RS=NAS(X) THEN 590
560 SC=SC+1
570 PRINT "RIGHT!"
580 GOTO 600
590 PRINT "NO, IT WAS ";NAS(X);"."
600 PRINT "WHAT IS ITS"
610 INPUT "BRIGHTEST STAR?":RS
620 IF RS=BS$(X) THEN 660
630 SC=SC+1
640 PRINT "RIGHT!"
650 GOTO 670

```


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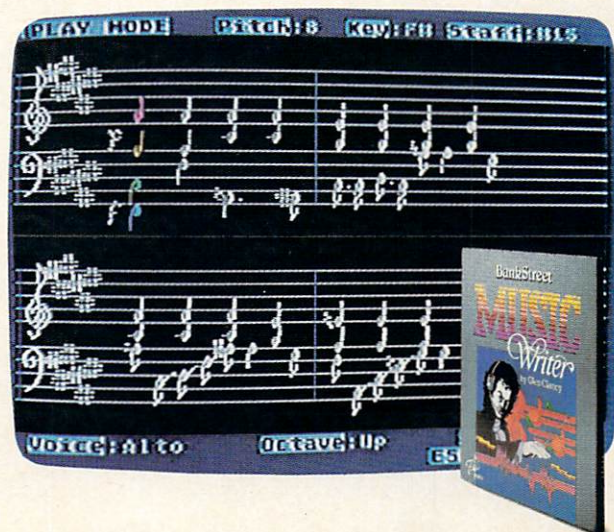
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BEGINNER PROGRAM

```

660 PRINT "NO, IT WAS ";B$(X);"."
670 PRINT
680 PRINT "PRESS ANY KEY TO CONTINUE."
690 CALL KEY(3,K,S)
700 IF S=0 THEN 690
710 NEXT I
720 IF Z=0 THEN 130
730 CALL CLEAR
740 PRINT "YOUR SCORE WAS";SC;"OUT OF 24."
750 PRINT "THAT'S";INT((SC/24)*100);"PERCENT CORRECT."
760 PRINT
770 PRINT "PRESS ANY KEY TO CONTINUE."
780 CALL KEY(3,K,S)
790 IF S=0 THEN 780
800 GOTO 130
1000 DATA CAPRICORN,ALGED1,1/20,2/18,13,158,253,379
1010 DATA 631,693,625,557,458,327,361,365,370,248
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,115,379,691
1030 DATA 175,47,109,107,359,679,771,418,417
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,673,613,615,553
1050 DATA 555,557,566,601,697,732,637,571,485,329,235
1060 DATA 171,105,43
1070 DATA ARIES,HAMAL,4/19,5/15,7,531,662,726,325,310
1080 DATA 143,83
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,307,212,278
1100 DATA 340,375,41,163,507,562,631,731,510,607
1110 DATA GEMINI,CASTOR,6/21,7/21,16,109,110,54,210
1120 DATA 441,542,637,271,270,333,266,425,560,628,794
1130 DATA 790
1140 DATA CANCER,BETA CANCRI,7/21,8/11,5,796,84,373
1150 DATA 500,753
1160 DATA LEO,REGULUS,8/12,9/16,14,632,798,473,404,277
1170 DATA 90,155,191,787,743,553,546,361,395
1180 DATA VIRGO,SPICA,9/21,11/1,12,721,617,504,475,413
1190 DATA 285,286,373,179,464,395,387
1200 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,339,76,264
1210 DATA 687,712,776
1220 DATA SCORPIO,ANTARES,11/23,11/30,15,373,311,91
1230 DATA 156,315,411,403,498,561,624,749,713,583,519
1240 DATA 457
1250 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,270,75,331
1260 DATA 336,307,428,468,279,534,535,627,725,713,742

```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Zodiac

```

10 FAST
20 DIM D$(12,3,15)
30 DIM S(12,19)
40 LET MS="CAPRICORN,ALGED1,1/20 AND 2/18,13,125,220,3
14,566,596,560,492,393,262,296,300,305,215,"
50 LET MS=MS+"AQUARIUS,SADALMELIK,2/17 AND 3/13,12,82,
314,594,142,14,76,74,294,582,674,353,352,"
60 LET MS=MS+"PISCES,ALRISCHA,3/13 AND 4/19,18,576,548
,550,488,490,492,501,536,600,635,572,506,420,264,202,1
38,72,10,"
70 LET MS=MS+"ARIES,HAMAL,4/19 AND 5/15,7,466,565,629,
260,245,110,50,"
80 LET MS=MS+"TAURUS,ALDEBARAN,5/14 AND 6/21,13,242,17
9,213,275,310,8,130,442,498,566,634,446,543,"
90 LET MS=MS+"GEMINI,CASTOR,6/21 AND 7/21,16,78,79,23,
179,378,479,574,208,207,270,203,362,497,565,699,695,"
100 LET MS=MS+"CANCER,BETA CANCRI,7/21 AND 8/11,5,699,
51,308,435,656,"
110 LET MS=MS+"LEO,REGULUS,8/12 AND 9/16,14,567,701,40
8,339,212,57,122,158,690,646,488,481,296,330,"
120 LET MS=MS+"VIRGO,SPICA,9/21 AND 11/1,12,626,554,44
1,412,350,222,222,310,148,401,332,324,"
130 LET MS=MS+"LIBRA,ZUBEN ELGENUBI,11/1 AND 11/22,6,2
74,43,199,590,615,679,"
140 LET MS=MS+"SCORPIO,ANTARES,11/23 AND 11/30,15,308,
246,58,123,250,346,338,433,496,559,652,616,518,454,392
,"
150 LET MS=MS+"SAGITTARIUS,NUNKI,12/19 AND 1/19,14,205
,42,266,271,242,363,403,214,469,470,562,628,616,645,"
160 LET P1=1

```

```

170 LET P2=10
180 FOR X=1 TO 12
190 FOR Y=1 TO 3
200 GOSUB 1000
210 LET D$(X,Y)=R$
220 LET D$(X,Y,15)=CHR$(LEN R$)
230 NEXT Y
240 GOSUB 1000
250 LET S(X,19)=VAL R$
260 FOR Y=1 TO S(X,19)
270 GOSUB 1000
280 LET S(X,Y)=VAL R$
290 NEXT Y
300 NEXT X
310 SLOW
320 CLS
330 PRINT TAB 13;"ZODIAC";AT 4,0;"PRESS <V> TO VIEW TH
E"
340 PRINT "CONSTELLATIONS OF THE"
350 PRINT "ZODIAC, <Q> FOR A QUICK QUIZ, OR";
360 PRINT "<E> TO END THE PROGRAM."
370 LET K$=INKEY$
380 IF K$="" THEN GOTO 370
390 IF K$="E" THEN STOP
400 IF K$("<V") AND K$("<Q") THEN GOTO 370
410 LET Z=(K$="Q")
420 LET SC=0
430 FOR I=1 TO 12
440 LET X=I
450 IF NOT Z THEN GOTO 480
460 LET X=INT (RND*12)+1
470 GOTO 590
480 CLS
490 PRINT "THE SUN IS IN THE"
500 PRINT "CONSTELLATION ";D$(X,1,TO CODE D$(X,1,15))
510 PRINT "BETWEEN ";D$(X,3,TO CODE D$(X,3,15));"."
520 PRINT
530 PRINT "THE BRIGHTEST STAR IN ";D$(X,1,TO CODE D$(X
,1,15))
540 PRINT "IS ";D$(X,2,TO CODE D$(X,2,15));"."
550 PRINT
560 PRINT "PRESS ANY KEY"
570 PRINT "TO VIEW ";D$(X,1,TO CODE D$(X,1,15));"."
580 PAUSE 5000
590 CLS
600 FOR Y=1 TO S(X,19)
610 LET Q=INT (S(X,Y)/32)
620 PRINT AT Q,S(X,Y)-Q*32;CHR$(23+29*(Y=1))
630 NEXT Y
640 PAUSE 300
650 IF NOT Z THEN GOTO 860
660 CLS
670 PRINT "WHAT CONSTELLATION WAS THAT?"
680 INPUT R$
690 PRINT R$
700 IF R$("<D$(X,1,TO CODE D$(X,1,15)) THEN GOTO 740
710 PRINT "RIGHT."
720 LET SC=SC+1
730 GOTO 750
740 PRINT "NO, IT WAS ";D$(X,1,TO CODE D$(X,1,15));"."
750 PRINT "WHAT IS ITS BRIGHTEST STAR?"
760 INPUT R$
770 PRINT R$
780 IF R$("<D$(X,2,TO CODE D$(X,2,15)) THEN GOTO 820
790 PRINT "RIGHT."
800 LET SC=SC+1
810 GOTO 830
820 PRINT "NO, IT IS ";D$(X,2,TO CODE D$(X,2,15));"."
830 PRINT
840 PRINT "PRESS ANY KEY TO CONTINUE."
850 PAUSE 40000
860 NEXT I
870 IF NOT Z THEN GOTO 320
880 CLS
890 PRINT "YOUR SCORE WAS ";SC
900 PRINT "OUT OF 24. THAT IS"
910 PRINT INT ((SC/24)*100);" PERCENT CORRECT." →

```

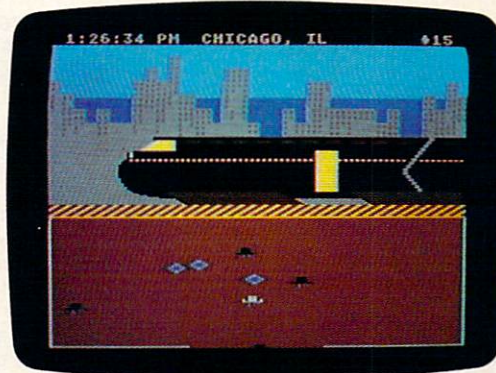



Help Agent U.S.A. stop the fuzz plague. And you can win a trip to Washington, D.C.

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).



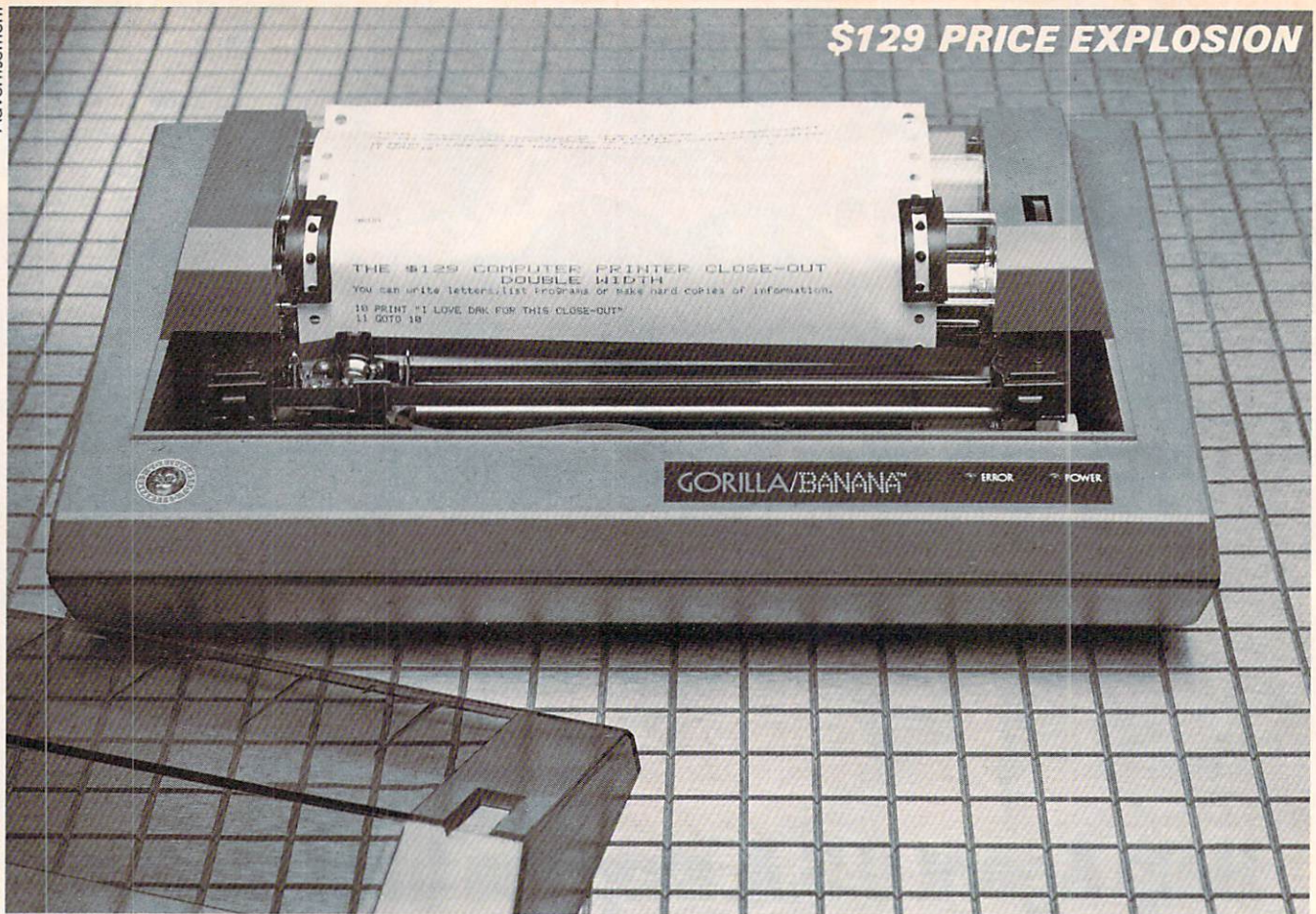
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Do it before the fuzz plague comes to your neighborhood!



Scholastic
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\$129 PRICE EXPLOSION

The Complete Computer

Here's a 50 character per second, plain paper, dot matrix printer that you can use with virtually any home or office personal computer. It's built really tough to withstand heavy use. It's really easy to use. And, it even prints graphics. Price Slashed to \$129.

By Drew Kaplan

Complete your computer. Now you can harness the full power of your computer. From writing letters to listing programs, your computer will be incredibly more useful.

It uses **plain paper** and it's super reliable. It prints both upper and lower case characters. And, if you aren't using a printer with your computer, read on.

LISTING/INDEXES/LETTERS AND MORE

Experience the thrill of actually writing your letters and reports on your computer. Now you'll be able to use all of your computer's word processing and **correcting** capabilities to really explore your creative talents.

It's easy. Some of the new word processing programs are so 'user friendly' that you can learn to use them in just about 10 minutes. Change a line, change a word, move a line. Just push a button.

Are data bases a four letter word? Not on your life. Now you can use your computer to organize all your telephone numbers, your stocks, stamps, and recipes.

If you're using your computer for business, you can have a complete, instantly accessible file for each customer by name, what they bought, when, etc.

A data base will let you find or organize and print out any information you want, however you want, whenever you want.

There's no more complicated programming required. And, inexpensive data base programs are available at any computer store.

PERMANENT RECORD

If you have a modem, you're in for a treat. You can access encyclopedias, stock market reports, and much more. When you sign on a service like CompuServe or The Source, the world is quite literally at your finger tips.

With a printer, you can get a 'hard copy' of all the incoming information. You can get everything from SAT test simulations and IQ tests to loan amortization schedules.

AFRAID OF PROGRAMMING?

You don't need to know the first thing about programming to use this or any printer. But, if you've never typed in and run a program, here's the easiest one I know. Turn on your computer.

Commodore Owners, and Atari Owners, your computer, and most others will say 'Ready'. Just push Control and Reset on an Apple. Then type the following:

```
10 PRINT "DAK IS WONDERFUL"
20 GOTO 10
RUN
```

You should type a carriage return at the end of each line. Why not try this program now? Next time, I'll tell you how to get out of the program, and maybe even discuss peeks and pokes.

If the program isn't running, type LPRINT instead of PRINT in line 10.

To you sophisticated programmers, think how easy your life will be when you can print out program lists that you can study at length.

And, you won't have to load a bunch of disks to find a program when you print out a menu for each of your disks.

LOOK AT ALL IT DOES

An ad in several August computer magazines listed a \$149 thermal printer (that needs expensive thermal paper) as the lowest priced printer in the U.S.

Imagine a 50 character per second, plain paper, full 80 column dot, matrix printer with a built-in standard Centronics Parallel Interface, slashed to just \$129.

This printer handles plain old cheap standard fanfold pin feed computer paper from 4.5" to 9.5" wide, with it's built-in adjustable tractor pin feed drive.

It's so powerful you can even use two-part forms for a carbon copy. Plus, there's an impact control for print darkness.

It understands and prints 116 upper and lower case characters, numerals and symbols. And that's not all.

You can even print Double Width characters. **And, look at this.** This printer has full graphic capabilities with 480 dot horizontal resolution and 63 dot per inch vertical resolution. So, you can print out your pictures, pie charts or graphs.

It prints 10 characters to the inch, six lines to the inch. In short, it's going to make typewriters into dinosaurs. When hooked to your computer, you'll never have to retype anything again. If you find an error, just make the correction and let the computer retype your work for you.

The printer is made by C.I.TOH/Leading Edge in Japan. It's built to really take heavy use. But in the unlikely event that it should need service, there are approximately 400 service centers nationwide.

It takes standard long life inked ribbon cassettes that are readily available nationwide. This is a printer that will give you many years of continuous reliable service and enjoyment.

AND NOW THE BAD NEWS

If you're the president of a large company sending important business letters, you may want a \$1000 daisy wheel printer. But for most uses, dot matrix printers are incredibly faster, and there isn't any way to print out a graph or picture on a daisy wheel printer.

But, there are two things you need to know about this printer. First, it has about the dumbest name I've ever seen. It's built tough and rugged. So, they named it The Gorilla Banana Printer.

Second, like many dot matrix printers, the letters g, j, p, q, and y are level with the other letters. Each letter is completely and perfectly formed, but each sits level with the rest of the alphabet.

Upper case letters and symbols are unaffected. So, if you don't want letters that look like they were printed by a computer, this printer isn't for you.

But for most letters, term papers or reports, programming and all the data bases and information you'll get through a modem, this printer is perfect.

COMPATIBLE COMPUTERS

Any Computer with a standard Centronics parallel port, such as: Apple, Franklin, IBM PC, TRS80, Osborne, Atari, Commodore VIC 20, Commodore 64, Kaypro, and virtually any other personal computer. Plus, most briefcase portables.

FEAR OF INTERFACES?

Your computer is smart. But, it doesn't know how to 'talk' to other devices. That's why you need an interface.

An interface isn't just a cable. It's actually an intelligent translator that lets your computer talk to other equipment.

Usually the computer manufacturers don't include the various interfaces when you buy your computer, because they don't know if you'll ever add peripherals such as disk drives, printers or modems.

So, rather than sell you something you don't need, you don't buy an interface until you add onto your computer.

There are two types of printer interfaces. The first allows you to do text word processing. For 99% of computer use, this is all that is needed. It translates all the possible letters and punctuation known as ASCII. This printer understands 116 characters and symbols.

A second type of interface also allows you to dump pictures or graphics from your screen or memory. This is more complicated because every dot must be told where to go. This interface, or 'driver program' as it is called, is available in two forms; built into an interface card, or as a program on a disk which you use in

conjunction with any standard interface.

Either way, you'll have the printer operating in just a few minutes. And if you already have a printer, the same Centronics parallel interface and cable (about 85% of all printers are compatible) should work with this printer.



With this printer you can alter your graphics as you desire. You can print normal or reversed (both shown above, reduced to fit in this catalog) and you can even print double size.

WHY SO CHEAP

A new model will emerge soon with a different name. Leading Edge had just 28,000 of these remarkable printers which have been selling at discount for as little as \$199, left in stock.

DAK bought them all for cold hard cash. And now we're offering them to you for less than the original price we were quoted as wholesale.

The printer is approximately 16½" wide, 9" deep and 7" tall. It's backed by Leading Edge's standard limited warranty.

ADD PRINTING POWER TO YOUR COMPUTER RISK FREE

Now you can really make use of your computer. 50 characters per second printing on plain paper for just \$129. Wow!

Now you can print out your programs, your notes or your letters. If you're not 100% satisfied, simply return the printer and any accessories in their original boxes to DAK within 30 days for a refund.

To order your 50 Character Per Second Dot Matrix, Plain Paper Printer with a built-in Centronics Parallel Interface, risk free with your credit card, call toll free, or send your check for the breakthrough close-out price of just \$129 plus \$8 for postage and handling to DAK. Order No. 4101. CA res add 6% sales tax.

Special Note: If you need a serial printer for a computer, such as the TRS80 Color Computer, order the identical printer with a built-in Serial Interface for the same price. Use Order No. 4102.

The Printer comes packaged with a long life ribbon. Extra ribbons are available at computer stores. DAK has them for \$4 each (\$1 P&H) Order No. 4103.

Standard Centronics Interfaces for your computer are available at any computer store. This Printer has its receiving inter-

face built in. You simply need one, complete with its cable, to plug into your computer 'to send' information. Below are our favorites for 5 of the most popular computers.

For your Apple. We have Practical Peripherals' text interface for just \$49 (\$2 P&H) Order No. 9877. We have their graphics capable interface for just \$79 (\$2 P&H) Order No. 4104. If you already have a Centronics Parallel Interface, we have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4105.

For your IBM PC, you don't need an interface. It's usually already built-in. But, you do need a cable. We have a cable, ready to connect this printer to your computer, for just \$19 (\$2 P&H) Order No. 9879. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4106.

For your Atari 800, 800XL, 400, or 600XL, we have a text interface for just \$69 (\$2 P&H) Order No. 9881. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4107.

For your Commodore VIC 20 or 64, we have a text interface for just \$39 (\$2 P&H) Order No. 9883. We have a Graphics Interface for just \$54 (\$2 P&H) Order No. 4108.

Special Bonus for Commodore 64 owners. We have a powerful word processing program with editing, including changing a line, a word, or moving a line. Once you've tried computer word processing, you'll never want to look at a typewriter again.

Plus, we have a super data base program that lets you use 8 fields of information on up to 200 subjects at a time. Then you can search for any part, sort alphabetically or numerically and print out an address book, a list of your stocks or anything you can imagine. They're both yours for just \$5 (\$1 P&H) with purchase of the printer. Use Order No. 4122 for Disk, or Order No. 4123 for Cassette.

For most TRS80 Computers, you don't need an interface, just a cable. For the Black and White Computers, we have a Parallel Cable for just \$18 (\$2 P&H) Order No. 9885. For the Color Computers we have a Serial Cable (you need the Serial Printer as well) for just \$18 (\$2 P&H) Order No. 4109.

For briefcase-type portables, the Centronics Interface is usually built-in. Just stop by any computer store. All Centronics Printers use the same cable at the printer end, but you'll need a cable that fits your particular computer's plug.

Get hard copy print-outs of your programs or your graphics. Turn your computer into a powerful word processor. Forget retyping ever again. For just \$129 you can make your computer complete.

Apple, Atari, IBM PC, Franklin, Commodore VIC 20 & 64, TRS80, Osborne, and Kaypro, are registered trademarks of Apple Computer, Atari Inc., International Business Machine Corp., Franklin Computer, Commodore Electronics Ltd., Radio Shack/Tandy, Osborne Corp. and Kaypro respectively.



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Dept. FC01

BEGINNER PROGRAM

```

920 PRINT
930 PRINT "PRESS ANY KEY TO CONTINUE."
940 PAUSE 40000
950 GOTO 320
1000 IF MS(P2)="," THEN GOTO 1030
1010 LET P2=P2+1
1020 GOTO 1000
1030 LET RS=MS(P1 TO P2-1)
1040 LET P1=P2+1
1050 LET P2=P1+1
1060 RETURN

```

TRS-80 Color Computer/Zodiac

```

10 DIM NAS(12),BS$(12),DTS(12,2),SN(12),STR(12,18)
20 FOR X=1 TO 12
30 READ NAS(X),BS$(X),DTS(X,1),DTS(X,2),SN(X)
40 FOR Y=1 TO SN(X)
50 READ STR(X,Y)
60 NEXT Y,X
70 CLS
80 PRINT TAB(13);"ZODIAC"
90 PRINT
100 PRINT "PRESS <V> TO VIEW THE"
110 PRINT "CONSTELLATIONS OF THE ZODIAC,"
120 PRINT "<Q> FOR A QUICK QUIZ,"
130 PRINT "OR <E> TO END THE PROGRAM.";
140 KS=INKEY$
150 IF KS="E" THEN END
160 IF KS<>"V" AND KS<>"Q" THEN 140
170 Z=(KS="Q")
180 SC=0
190 FOR I=1 TO 12
200 IF Z THEN X=RND(12):GOTO 320 ELSE X=I
210 CLS
220 PRINT "THE SUN IS IN THE"
230 PRINT "CONSTELLATION ";NAS(X)
240 PRINT "BETWEEN ";DTS(X,1);" AND ";DTS(X,2);"."
250 PRINT
260 PRINT NAS(X);"'S BRIGHTEST STAR IS"
270 PRINT BS$(X);"."
280 PRINT
290 PRINT "PRESS ANY KEY"
300 PRINT "TO VIEW ";NAS(X);"."
310 IF INKEY$="" THEN 310
320 CLS(0)
330 FOR Y=1 TO SN(X)
340 PRINT@STR(X,Y),CHR$(193-(48*(Y=1)));
350 NEXT Y
360 FOR D=1 TO 2000
370 NEXT D
380 IF NOT Z THEN 510
390 CLS
400 PRINT "WHAT CONSTELLATION"
410 INPUT "WAS THAT";RS
420 IF RS=NAS(X) THEN SC=SC+1:PRINT "RIGHT!";GOTO 440
430 PRINT "NO, IT WAS ";NAS(X);"."
440 PRINT "WHAT IS ITS"
450 INPUT "BRIGHTEST STAR";RS
460 IF RS=BS$(X) THEN SC=SC+1:PRINT "RIGHT!";GOTO 480
470 PRINT "NO, IT IS ";BS$(X);"."
480 PRINT
490 PRINT "PRESS ANY KEY TO CONTINUE."
500 IF INKEY$="" THEN 500
510 NEXT I
520 IF NOT Z THEN 70
530 CLS
540 PRINT "YOUR SCORE WAS";SC;"OUT OF 24."
550 PRINT "THAT'S";INT((SC/24)*100);"PERCENT CORRECT."
560 PRINT
570 PRINT "PRESS ANY KEY TO CONTINUE."
580 IF INKEY$="" THEN 580
590 GOTO 70
1000 DATA CAPRICORN,ALGEDI,1/20,2/18,13,93,156,250,406
1010 DATA 436,400,364,297,198,232,236,241,151
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,50,250,434

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```

1030 DATA 110,14,44,42,230,422,482,257,256
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,416,388,390,360
1050 DATA 362,364,373,376,440,475,412,378,292,200,138
1060 DATA 106,40,10
1070 DATA ARIES,HAMAL,4/19,5/15,7,338,437,469,196,181
1080 DATA 78,50
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,178,115,181
1100 DATA 211,246,8,98,314,370,406,474,318,383
1110 DATA GEMINI,CASTOR,6/21,7/21,16,46,47,23,115,282
1120 DATA 351,414,176,175,206,171,266,369,405,507,503
1130 DATA CANCER,BETA CANCRI,7/21,8/11,5,507,51,244
1140 DATA 307,496
1150 DATA LEO,REGULUS,8/12,9/16,14,407,509,312,275,180
1160 DATA 57,90,126,498,486,360,353,232,266
1170 DATA VIRGO,SPICA,9/21,11/1,12,466,394,313,316,254
1180 DATA 190,190,246,116,305,236,228
1190 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,210,43,167
1200 DATA 430,455,487
1210 DATA SCORPIO,ANTARES,11/23,11/30,15,212,182,58,91
1220 DATA 186,250,242,305,368,399,492,456,358,326,296
1230 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,173,42,202
1240 DATA 207,178,267,307,182,341,342,402,468,456,485

```

TRS-80 Model III/Zodiac

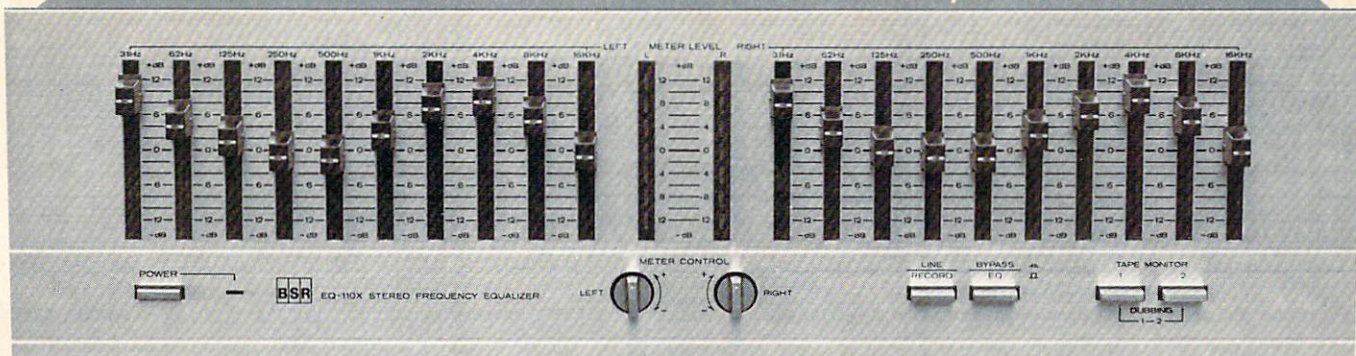
```

10 DIM NAS(12),BS$(12),DTS(12,2),SN(12),STR(12,18)
20 FOR X=1 TO 12
30 READ NAS(X),BS$(X),DTS(X,1),DTS(X,2),SN(X)
40 FOR Y=1 TO SN(X)
50 READ STR(X,Y)
60 NEXT Y,X
70 CLS
80 PRINT TAB(29);"ZODIAC"
90 PRINT
100 PRINT "PRESS <V> TO VIEW THE"
110 PRINT "CONSTELLATIONS OF THE ZODIAC,"
120 PRINT "<Q> FOR A QUICK QUIZ,"
130 PRINT "OR <E> TO END THE PROGRAM.";
140 KS=INKEY$
150 IF KS="E" THEN END
160 IF KS<>"V" AND KS<>"Q" THEN 140
170 Z=(KS="Q")
180 SC=0
190 FOR I=1 TO 12
200 IF Z THEN X=RND(12):GOTO 290 ELSE X=I
210 CLS
220 PRINT "THE SUN IS IN THE CONSTELLATION"
230 PRINT NAS(X);" BETWEEN ";DTS(X,1);" AND ";DTS(X,2);"."
240 PRINT
250 PRINT NAS(X);"'S BRIGHTEST STAR IS ";BS$(X);"."
260 PRINT
270 PRINT "PRESS ANY KEY TO VIEW ";NAS(X);"."
280 IF INKEY$="" THEN 280
290 CLS
300 FOR Y=1 TO SN(X)
310 PRINT@STR(X,Y),CHR$(42-89*(Y=1));
320 NEXT Y
330 FOR D=1 TO 1500
340 NEXT D
350 IF NOT Z THEN 460
360 CLS
370 INPUT "WHAT CONSTELLATION WAS THAT";RS
380 IF RS=NAS(X) THEN SC=SC+1:PRINT "RIGHT!";GOTO 400
390 PRINT "NO, IT WAS ";NAS(X);"."
400 INPUT "WHAT IS ITS BRIGHTEST STAR";RS
410 IF RS=BS$(X) THEN SC=SC+1:PRINT "RIGHT!";GOTO 430
420 PRINT "NO, IT IS ";BS$(X);"."
430 PRINT
440 PRINT "PRESS ANY KEY TO CONTINUE."
450 IF INKEY$="" THEN 450
460 NEXT I
470 IF NOT Z THEN 70
480 CLS
490 PRINT "YOUR SCORE WAS";SC;"OUT OF 24."
500 PRINT "THAT'S";INT((SC/24)*100);"PERCENT CORRECT."

```


\$89 CLOSE-OUT

Advertisement



Sound Detonator Plus

Make your stereo system's sound explode with life. Improve the sound quality by 30 to 50%. Plus, you'll add tape dubbing too with this limited BSR \$89 close-out.

It's like night and day. Crashing cymbals, the depth of a string bass, more trumpets or more voice will come bursting forth from your stereo at your command.

You'll make your music so vibrant that it will virtually knock your socks off when you use this professional quality 10 band stereo Sound Detonator Plus Equalizer.

It has a frequency response from 5hz to 100,000hz ± 1 db. BSR, the ADC equalizer people, make this super equalizer and back it with a 2 year limited warranty. Our \$89 close-out price is just a fraction of its true \$249 retail value.

CAN YOUR STEREO SOUND BETTER?

Incredibly better. Equalizers are different from regular bass and treble controls. And, 10 band EQs are the best.

Bass controls turn up the entire low end as well as the low mid-range, making the sound muddy and heavy. With an equalizer, you simply pick the exact frequencies you want to enhance.

You can boost the low-bass at 31hz, 62hz and/or 125hz, and the mid-bass at 250hz and 500hz to animate specific areas of the musical spectrum.

And, when you boost the part of the bass you like, you don't disturb the mid-range frequencies and make your favorite singer sound like he has a sore throat.

The high frequencies really determine the clarity and brilliance of your music.

You can boost the mid-range and highs at 1,000hz, 2,000hz, 4,000hz, 8,000hz and 16,000hz. So, you can bring crashing cymbals to life at 16,000hz while at the same time you cut tape hiss or annoying record scratches at 8000hz.

You can also boost or cut specific mid-range frequency areas to add or subtract vocal, trumpets, guitars or whatever instrument ranges you prefer.

GREAT FOR 2 TAPE DECKS

You can push a button and transfer all the equalization power to the inputs of two tape decks. So, if you have a cassette deck in your car or a personal stereo that you wear, now you can pre-equalize your cassettes as you record them.

Now you can get all the dramatically enhanced sound wherever you are. This

is an especially great feature for bass starved portables and high-end starved car stereos to make them come alive.



And, look at this. There are two tape inputs and outputs, so you can dub from tape deck A to B, or make two tapes at once with or without equalization.

EASY HOOK UP

Use your tape monitor circuit, but don't lose it. Now your one tape monitor circuit lets you connect two tape decks.

Just plug the equalizer into the tape 'in' and 'out' jacks on your receiver. We even supply the cables.

As you listen to your records, FM or 'aux', any time you push the tape monitor switch on your receiver you'll hear your music jump to life.

The output from your receiver is always fed directly to your tape decks for recording, and with the touch of a button, you can choose to send equalized or non-equalized signal to your recorders.

When you want to listen to a tape deck, just press a tape monitor button on the equalizer and your tape deck will work **exactly** as it did before. Except, that now you can choose to listen with or without equalization and you can dub.

You won't be listening to any distortion or hum. The Sound Detonator Plus has a 95db signal to noise ratio and total harmonic distortion of just 0.018%.

Once you've set your equalizer controls, switch it in and out of the system. You'll hear such an explosive improvement in sound, you'll think you've added thousands of dollars of new equipment.

WHY A CLOSE-OUT?

Last year DAK closed out over 18,000 of BSR's 7 band equalizers because BSR had decided to only sell equalizers under their ADC name and they still had some left with the BSR name on them.

Well, as Detroit comes out with new cars each year, ADC comes out with new equalizers. We got them to supply us

with just 15,000 of last year's model before they shut down for the new one.

They had already paid for all the tooling, all the research and design, so we were able to buy these for less than half the normal price, for cold hard cash.

So, you can go to any HiFi store and buy this year's design in an ADC equalizer made by the parent company BSR, or you can get this \$249 value BSR equalizer while our limited supply lasts, for \$89.

THE FINAL FACTS

There are 20 slide controls, each with a bright LED to clearly show its position. Each control will add or subtract up to 12db. (That's a 24db range!)

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BEGINNER PROGRAM

```

510 PRINT
520 PRINT "PRESS ANY KEY TO CONTINUE."
530 IF INKEY$="" THEN 530 ELSE 70
1000 DATA CAPRICORN,ALGEDI,1/20,2/18,13,186,312,499
1010 DATA 811,872,800,728,594,397,464,472,482,302
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,101,501
1030 DATA 867,221,27,88,85,459,843,963,514,512
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,832,776,779,720
1050 DATA 723,728,746,752,880,950,824,755,584,400,277
1060 DATA 211,80,21
1070 DATA ARIES,HAMAL,4/19,5/15,7,675,874,938,392,362
1080 DATA 157,99
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,355,230,362
1100 DATA 422,491,16,197,629,739,813,949,637,766
1110 DATA GEMINI,CASTOR,6/21,7/21,16,91,94,46,230,563
1120 DATA 702,827,352,350,411,342,533,738,810,1014
1130 DATA 1006
1140 DATA CANCER,BETA CANCRI,7/21,8/11,5,1014,102,488
1150 DATA 614,992
1160 DATA LEO,REGULUS,8/12,9/16,14,814,1018,624,550
1170 DATA 360,114,181,251,997,971,720,706,464,533
1180 DATA VIRGO,SPICA,9/21,11/1,12,931,787,626,632,509
1190 DATA 381,379,491,232,610,472,456
1200 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,419,86,334
1210 DATA 861,910,974
1220 DATA SCORPIO,ANTARES,11/23,11/30,15,424,363,115
1230 DATA 182,373,501,485,610,736,798,984,912,715,651
1240 DATA 592
1250 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,346,85,405
1260 DATA 414,357,534,614,365,682,685,805,936,912,970

```

VIC-20 w/8K or 16K RAM Cartridge/Zodiac

```

10 DIM NAS(12),BSS(12),DTS(12,2),SN(12),STR(12,18)
19 REM --FIND SCREEN AND COLOR MEMORY--
20 SM=4*(PEEK(36866) AND 128)+64*(PEEK(36869) AND 112)
30 CM=37888+4*(PEEK(36866) AND 128)
40 POKE 36879,8
50 FOR X=1 TO 12
60 READ NAS(X),BSS(X),DTS(X,1),DTS(X,2),SN(X)
70 FOR Y=1 TO SN(X)
80 READ STR(X,Y)
90 NEXT Y,X
100 PRINT CHR$(147);
110 PRINT TAB(8);CHR$(5);"ZODIAC"
120 PRINT
130 PRINT "PRESS <V> TO VIEW"
140 PRINT "THE CONSTELLATIONS"
150 PRINT "OF THE ZODIAC,"
160 PRINT "<Q> FOR A QUICK QUIZ,"
170 PRINT "OR <E> TO END"
180 PRINT "THE PROGRAM.";
190 GET K$
200 IF K$="E" THEN END
210 IF K$="V" AND K$<>"Q" THEN 190
220 Z=(K$="Q")
230 SC=0
240 FOR I=1 TO 12
250 IF Z THEN X=INT(RND(1)*12)+1:GOTO 410
260 X=I
270 PRINT CHR$(147);
280 PRINT "THE SUN IS IN"
290 PRINT "THE CONSTELLATION"
300 PRINT NAS(X);" BETWEEN"
310 PRINT DTS(X,1);" AND ";DTS(X,2);"."
320 PRINT
330 PRINT NAS(X);" IS"
340 PRINT "BRIGHTEST STAR IS"
350 PRINT BSS(X);"."
360 PRINT
370 PRINT "PRESS ANY KEY TO"
380 PRINT "VIEW ";NAS(X);"."
390 GET K$
400 IF K$="" THEN 390
410 PRINT CHR$(147);
420 FOR Y=1 TO SN(X)

```

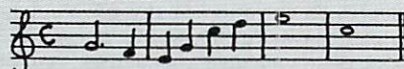
```

430 POKE SM+STR(X,Y),42-(39*(Y=1))
440 POKE CM+STR(X,Y),1
450 NEXT Y
460 FOR D=1 TO 3000
470 NEXT D
480 IF NOT Z THEN 650
490 PRINT CHR$(147);
500 PRINT "WHAT CONSTELLATION"
510 INPUT "WAS THAT?";R$
520 IF R$=NAS(X) THEN SC=SC+1:PRINT "RIGHT!":GOTO 550
530 PRINT "NO, IT WAS"
540 PRINT NAS(X);"."
550 PRINT "WHAT IS ITS BRIGHTEST"
560 INPUT "STAR";R$
570 IF R$=BSS(X) THEN SC=SC+1:PRINT "RIGHT!":GOTO 600
580 PRINT "NO, IT IS"
590 PRINT BSS(X);"."
600 PRINT
610 PRINT "PRESS ANY KEY"
620 PRINT "TO CONTINUE."
630 GET K$
640 IF K$="" THEN 630
650 NEXT I
660 IF NOT Z THEN 100
670 PRINT CHR$(147);
680 PRINT "YOUR SCORE WAS";SC
690 PRINT "OUT OF 24."
700 PRINT "THAT'S";INT((SC/24)*100)
710 PRINT "PERCENT CORRECT."
720 PRINT
730 PRINT "PRESS ANY KEY"
740 PRINT "TO CONTINUE."
750 GET K$
760 IF K$="" THEN 750
770 GOTO 100
1000 DATA CAPRICORN,ALGEDI,1/20,2/18,13,86,151,238,389
1010 DATA 432,385,338,270,202,225,228,232,148
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,57,238,430
1030 DATA 98,9,52,51,224,422,485,265,264
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,418,377,378,336
1050 DATA 337,338,344,369,435,459,393,348,289,204,139
1060 DATA 95,50,7
1070 DATA ARIES,HAMAL,4/19,5/15,7,320,410,454,201,190
1080 DATA 76,34
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,188,123,168
1100 DATA 211,235,6,90,304,342,389,458,307,373
1110 DATA GEMINI,CASTOR,6/21,7/21,16,53,54,16,123,282
1120 DATA 329,394,165,164,207,162,271,342,388,503,500
1130 DATA CANCER,BETA CANCRI,7/21,8/11,5,503,35,234
1140 DATA 299,473
1150 DATA LEO,REGULUS,8/12,9/16,14,390,504,281,255,168
1160 DATA 39,84,108,497,466,336,331,226,249
1170 DATA VIRGO,SPICA,9/21,11/1,12,452,381,303,283,263
1180 DATA 175,174,235,102,276,250,245
1190 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,210,30,159
1200 DATA 428,445,489
1210 DATA SCORPIO,ANTARES,11/23,11/30,15,234,191,40,85
1220 DATA 194,260,255,298,341,384,470,446,356,312,270
1230 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,163,29,205
1240 DATA 208,189,272,277,169,322,323,387,454,446,465

```

SOLUTION TO LAST MONTH'S PUZZLE

Sorry if we fooled you, but the clue to the mystery melody isn't to be found in the musical notes in the illustration. Instead, it's hidden in the labels of four volumes of an encyclopedia on the third shelf of books. If you look closely, you'll see that the alphabet labels on the volumes are out of order, and that, in the case of Vol. 4 at least, the label (E-C) makes no sense at all! If you take the four volumes in order, their labels read: G-F, E-G, C-D, E-C. These notes translate into the musical phrase shown below:



... which you may recognize as the beginning of the chorus of "The Battle Hymn of the Republic." If you'd entered these notes and pressed RETURN, you'd have been treated to a rendition of the whole melody, along with Bart Bricker's catchy lyrics.


```

310 SC=SC+50:SC$=RIGHT$(STR$(SC),LEN(STR$(SC))-1)
320 POKE 214,21:PRINT:PRINT TAB(13-LEN(SC$)):SC$;
330 POKE S%+MX%+MY%*N%,H%:POKE C+MX%+MY%*N%,0:FOR D=1
TO 3:NEXT:GOTO 370
340 POKE V,0:FX=FX+1:GOTO 370
350 IF G%<100 THEN G%=G%+1:P%=P%-10:GOTO 390
360 POKE S%+FX%+FY%*N%,32:POKE C+FX%+FY%*N%,1
370 FX%=INT(RND(1)*N%):FY%=INT(RND(1)*N%):IF FX%=MX% A
ND FY%=MY% THEN 370
380 POKE S%+FX%+FY%*N%,41:POKE C+FX%+FY%*N%,4:G%=0:P%=
1000
390 IF R%<150 THEN R%=R%+FX:GOTO 190
400 R%=0:IF RND(1)<0.3 THEN 190
410 CX%=INT(RND(1)*N%):CY%=INT(RND(1)*N%):IF CX%=FX% A
ND CY%=FY% THEN 410
420 CK%=INT(RND(1)*4)+34:IF CX%=MX% AND CY%=MY% THEN 4
40
430 POKE S%+CX%+CY%*N%,CK%:POKE C+CX%+CY%*N%,3:POKE V,
128:POKE V,0:GOTO 190
440 FOR I=250 TO 130 STEP -10
450 POKE S%+MX%+MY%*N%,H%:POKE C+MX%+MY%*N%,2:FOR D=1
TO 10:NEXT
460 POKE S%+MX%+MY%*N%,CK%:POKE C+MX%+MY%*N%,3:FOR D=1
TO 10:NEXT
470 POKE V+1,I:NEXT:POKE V+1,0:POKE S%+MX%+MY%*N%,42
480 FOR I=1 TO 25:POKE C+MX%+MY%*N%,INT(RND(1)*7)
490 FOR D=1 TO 35:NEXT:POKE V,128+INT(RND(1)*128):NEXT
:POKE V,0
500 POKE 36869,240:IF J% THEN POKE 37139,128:POKE 3715
4,255
510 PRINT CHR$(147);"YOU FELL THROUGH":PRINT "THE ICE!
":PRINT
520 IF SC>HS THEN HS=SC
530 PRINT "YOUR SCORE: ";SC
540 PRINT "HIGH SCORE: ";HS
550 PRINT:PRINT "PRESS <P> TO":PRINT "PLAY AGAIN OR":P
RINT "<Q> TO QUIT."
560 GET J$:IF J$<>"P" AND J$<>"Q" THEN 560
570 IF J$="P" THEN 130
580 END
1000 DATA 255,255,255,255,255,255,255,255
1010 DATA 128,64,64,32,24,36,66,1
1020 DATA 1,2,36,20,8,8,112,128
1030 DATA 135,72,48,32,16,14,2,1
1040 DATA 129,114,14,16,32,48,72,128
1050 DATA 24,8,28,106,29,36,38,98
1060 DATA 24,24,60,90,24,36,36,36
1070 DATA 24,16,56,87,184,36,100,70
1080 DATA 60,66,165,129,165,153,66,60
1090 DATA 60,66,153,165,165,153,66,60

```

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COMMODORE 64 HIGH-RESOLUTION GRAPHICS— FOR BUDDING EXPERTS

WITH COM-GRAFIX, YOU DON'T HAVE TO BE A PROGRAMMING PRO TO CREATE PROFESSIONAL-LOOKING GRAPHICS **BY LOUIS R. WALLACE**

High-resolution graphics: tiny points and fine lines that form razor-sharp pictures on your computer screen. Applications for hi-res graphics range from games to art, mathematics, engineering, architecture, and design.

If you run commercial software on your Commodore 64, you've probably seen what hi-res graphics can do and may have wondered how to create similar effects in programs you write yourself. It's not easy. Unlike most other computers with hi-res graphics capabilities, the C 64 doesn't come with simple BASIC commands that let you switch back and forth between graphics and text, plot points and draw lines on a hi-res graphics screen, and so on. Instead, you're required to learn a number of complex techniques and procedures that do these things with BASIC PEEK and POKE statements. It's so complicated that many beginning programmers find that it's simply not worth the trouble.

Of course, you can always buy a commercial program that adds graphics commands like PLOT and LINE to Commodore BASIC. That will cost you some money, though; and programs you write that include those additional commands won't run under regular BASIC on your friends' Commodore 64s.

Your third option is to do it using *Com-Grafix*, a program that adds 11 hi-res graphics functions to regular Commodore BASIC. With *Com-Grafix*'s simple commands, your BASIC programs can switch back and forth between hi-res graphics and text modes, choose hi-res colors, plot points, draw lines, and even SAVE hi-res pictures to disk or cassette. And you can give copies of *Com-Grafix* to your friends so they can run your graphics programs, too (and even write their own).

HIGH-RES GRAPHICS MADE SIMPLE

Start by entering the *Com-Grafix* BASIC program on the following pages. Be particularly careful when entering the many numbers in the DATA statements. SAVE the program to disk or cassette before typing RUN.

The first time you RUN the program, *Com-Grafix* will check to see if you have made any typing errors in its DATA statements. If it finds any errors, correct them by looking at the listing, and (this is important) SAVE a new copy of the program to disk or cassette before running it again. If all the DATA is OK, *Com-Grafix* will install the new commands in an out-of-the-way area of your com-

puter's memory where, under most circumstances, they'll stay until you turn your computer off. The *Com-Grafix* BASIC program will then remind you to SAVE a final copy, if you've haven't done so already. If you have, press "Y", and the *Com-Grafix* BASIC program will delete itself.

Your new graphics commands are now ready to use. When you want to use *Com-Grafix* commands in the future, you can simply LOAD and RUN the program again in order to install *Com-Grafix* in your machine.

11 COMMANDS

Each *Com-Grafix* function is executed by a BASIC SYS statement. A SYS statement consists of the word SYS, followed by a space, and then a number, depending on the *Com-Grafix* function you want to use. The table below contains a short description of each *Com-Grafix* function and shows the correct SYS command for using it. Where a *Com-Grafix* function requires information to do its job (usually a pair of numbers: for example, values for the x and y coordinates of a point you want to plot) you must provide this information exactly in the formats shown (i.e., with no extra punctuation or spaces), substituting your values for the sample variables in the SYS expression. This table is intended primarily for reference. You should read the more complete instructions for each command before using *Com-Grafix* in any substantial programming project. In general, because the SYS command is used to communicate with the Commodore at a very low level and, if mistyped, can cause unpredictable things to happen, it is a good idea to SAVE programs that use SYS expressions before RUNNING them.

| COMMAND FORMAT | FUNCTION |
|------------------------|---|
| SYS 49155 | Enter hi-res graphics mode |
| SYS 49158 | Return to text mode |
| SYS 49161 | Clear hi-res screen |
| SYS 49164,BC,FC | Set hi-res background and foreground colors |
| SYS 49167 | Invert colors on hi-res screen |
| SYS 49170,X,Y | Turn on a dot |
| SYS 49173,X,Y | Turn off a dot |
| SYS 49176,X1,Y1,X2,Y2 | Draw a line |
| SYS 49179,X1,Y1,X2,Y2 | Erase a line |
| SYS 49182,"FILENAME",8 | Save a hi-res picture to disk |
| SYS 49182,"FILENAME",1 | Save a hi-res picture to cassette |
| SYS 49185,"FILENAME",8 | Load a hi-res picture from disk |
| SYS 49185,"FILENAME",1 | Load a hi-res picture from cassette |

Enter Hi-Res Graphics Mode: SYS 49155

The statement SYS 49155 instructs *Com-Grafix* to clear and display your hi-res screen.

LOUIS R. WALLACE is a chemist and computer consultant to the University of Florida Pesticide Research Laboratory. He is past president of the Gainesville, Florida, Commodore Users' Group.

Return to Text Mode: SYS 49158

SYS 49158 instructs *Com-Grafix* to clear and display your normal text screen once again.

Clear Hi-Res Screen: SYS 49161

Executing this command will erase everything on your hi-res screen—giving you a clean slate to work with.

Set High-Res Background and Foreground Colors:

SYS 49164,BC,FC

SYS 49164,BC,FC sets the background color of your high-res screen and determines the color of the dots (pixels) you plot on it (foreground color). You must supply numeric values for BC (Background Color) and FC (Foreground, or dot, Color). Each may range from 0 to 15, corresponding to the colors shown in the table below:

| | | | |
|---------|----------|-----------|-------------|
| 0 Black | 4 Purple | 8 Orange | 12 Gray 2 |
| 1 White | 5 Green | 9 Brown | 13 Lt Green |
| 2 Red | 6 Blue | 10 Lt Red | 14 Lt Blue |
| 3 Cyan | 7 Yellow | 11 Gray 1 | 15 Gray 3 |

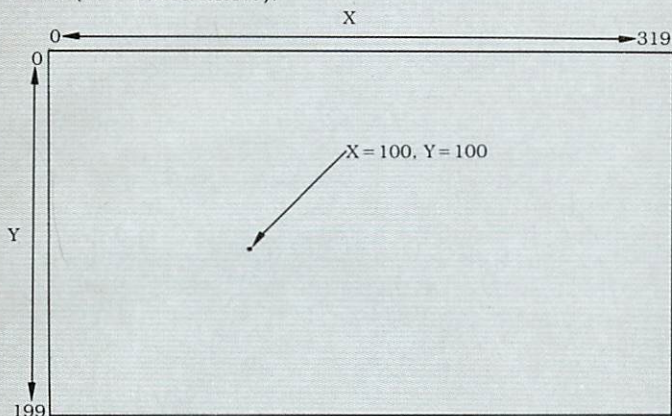
For example, if you wish to plot in blue on a yellow background, execute SYS 49164,7,6.

Invert Colors on High-Res Screen: SYS 49167

This command creates a "negative" of whatever you've drawn on the screen by changing all areas of the foreground color to the background color and vice versa. The background and foreground colors remain the same as previously set, so subsequent dots and lines will be drawn in the old foreground color.

Turn on a Dot: SYS 49170,X,Y

The Commodore hi-res graphics screen contains 64,000 dots, arranged in a grid 320 dots across by 200 down (see illustration).



SYS 49170,X,Y turns on (plots) a dot x dots in from the left side of the screen and y dots down from the top. x may range from 0 to 319— y from 0 to 199. If you try to plot a point with x or y coordinates outside these ranges (in other words, off the screen), nothing will happen.

Turn Off a Dot: SYS 49173,X,Y

This turns off the dot with horizontal coordinate x (0–319) and vertical coordinate y (0–199). Nothing will happen if x or y is out of range.

Draw a Line: SYS 49176,X1,Y1,X2,Y2

This draws a line between the dot with coordinates $x1, y1$ and the dot with coordinates $x2, y2$. If the coordinates of either point are out of range, no line will be drawn.

Erase a Line: SYS 49179,X1,Y1,X2,Y2

This erases a line between the dot with coordinates $x1, y1$ and the dot with coordinates $x2, y2$. See above for restrictions.

Save a High-Res Picture to Disk or Cassette:

SYS 49182,"FILENAME",8 (for disk)

SYS 49182,"FILENAME",1 (for cassette)

This command saves your current hi-res screen on disk or cassette under a filename you supply. Screen and dot colors are not saved, so when you load the picture in again you will have to reset them using the SYS 49164,BC,FC command. The filename must be enclosed in quotes, must begin with a letter, and may be no more than eight characters long.

Cassette users: It is helpful to press PLAY and RECORD on your Datassette *before* executing SYS 49182. This will prevent the PRESS PLAY ON TAPE prompt from appearing on your screen and messing up your picture.

Load a High-Res Picture from Disk or Cassette:

SYS 49185,"FILENAME",8 (for disk)

SYS 49185,"FILENAME",1 (for cassette)

This command LOADS a high-res picture (SAVED with the previous command) from disk or tape into your hi-res screen. Enclose "filename" in quotes. Note: you must switch to hi-res mode with SYS 49155 *before* LOADING a high-res picture. Note also that the screen and dot colors may not be the same as in the original picture. You may reset them manually using SYS 49164,BC,FC.

Cassette users: To prevent the PRESS PLAY ON TAPE prompt from appearing on your hi-res screen, press PLAY on your Datassette *before* executing SYS 49185.

Commodore 64/Com-Grafix

10 CK=0:LN=1000

20 FOR X=49152 TO 49912 STEP 10

30 PRINT CHR\$(147);"NOW PROCESSING DATA IN LINE";LN

40 FOR Y=0 TO 9

50 READ T:CK=CK+T:IF T>255 THEN 80

60 POKE X+Y,T:NEXT Y:READ T

70 IF T=CK THEN LN=LN+10:CK=0:NEXT X:GOTO 130

80 PRINT "DATA ERROR IN LINE";LN;CHR\$(157);"

90 PRINT "PLEASE CORRECT THE ERROR, THEN SAVE"

100 PRINT "A NEW COPY OF THIS PROGRAM BEFORE"

110 PRINT "RUNNING IT AGAIN."

120 END

130 PRINT "COM-GRAFIX IS INSTALLED."

140 PRINT:INPUT "HAVE YOU SAVED THIS PROGRAM";TS

150 IF LEFT\$(TS,1)="Y" THEN SYS 49152:CLR:NEW

160 PRINT "PLEASE SAVE THIS PROGRAM BEFORE"

170 PRINT "RUNNING IT AGAIN."

180 END

1000 DATA 76,36,192,76,50,192,76,73,192,76,1039

1010 DATA 93,192,76,109,192,76,146,192,76,181,1333

1020 DATA 192,76,189,192,76,116,193,76,124,193,1427

1030 DATA 76,210,194,76,234,194,169,1,133,43,1330

1040 DATA 169,64,133,44,169,0,141,0,64,96,880

1050 DATA 173,17,208,9,32,141,17,208,173,24,1002

1060 DATA 208,9,8,141,24,208,32,68,229,32,959

1070 DATA 93,192,96,173,17,208,41,223,141,17,1201

1080 DATA 208,173,24,208,41,247,141,24,208,32,1306

1090 DATA 68,229,96,169,32,133,252,169,0,133,1281

1100 DATA 251,162,32,168,24,32,164,192,96,32,1153

1110 DATA 253,174,32,235,183,165,20,41,15,133,1251

1120 DATA 20,138,41,15,24,42,42,42,42,101,507

1130 DATA 20,160,4,132,252,160,0,132,251,162,1273

1140 DATA 4,24,32,164,192,96,169,32,133,252,1098

1150 DATA 169,0,133,251,162,32,168,177,251,56,1399

1160 DATA 32,164,192,96,144,4,177,251,73,255,1388

1170 DATA 145,251,200,208,245,230,252,202,208,240,2181

1180 DATA 96,169,1,141,16,195,76,194,192,169,1249

1190 DATA 0,141,16,195,32,253,174,32,235,183,1261

1200 DATA 24,165,20,164,21,32,214,192,176,3,1011

1210 DATA 32,231,192,96,134,87,133,88,132,89,1214

1220 DATA 224,200,176,6,192,1,144,2,201,64,1210

1230 DATA 96,169,32,133,252,169,0,133,251,24,1259

1240 DATA 165,87,41,7,101,251,133,251,169,0,1205

1250 DATA 101,252,133,252,24,165,88,41,248,101,1405

FEATURE PROGRAM

```

1260 DATA 251,133,251,165,89,101,252,133,252,165,1792
1270 DATA 87,41,248,141,250,194,169,0,141,251,1522
1280 DATA 194,24,14,250,194,46,251,194,14,250,1431
1290 DATA 194,46,251,194,14,250,194,46,251,194,1634
1300 DATA 173,250,194,101,251,133,251,173,251,194,1971
1310 DATA 101,252,133,252,24,14,250,194,46,251,1517
1320 DATA 194,14,250,194,46,251,194,173,250,194,1760
1330 DATA 101,251,133,251,173,251,194,101,252,133,1840
1340 DATA 252,165,88,41,7,168,169,0,56,106,1052
1350 DATA 136,16,252,162,0,172,16,195,240,5,1194
1360 DATA 1,251,129,251,96,73,255,33,251,129,1469
1370 DATA 251,96,169,1,141,16,195,76,129,193,1267
1380 DATA 169,0,141,16,195,32,253,174,32,235,1247
1390 DATA 183,165,20,164,21,32,214,192,176,227,1394
1400 DATA 141,252,194,140,253,194,142,254,194,32,1796
1410 DATA 253,174,32,235,183,165,20,164,21,32,1279
1420 DATA 214,192,176,203,141,0,195,140,1,195,1457
1430 DATA 142,2,195,56,173,0,195,237,252,194,1446
1440 DATA 141,17,195,173,1,195,237,253,194,141,1547
1450 DATA 18,195,32,164,194,141,8,195,201,1,1149
1460 DATA 208,2,169,0,141,9,195,32,183,194,1133
1470 DATA 173,17,195,141,4,195,173,18,195,141,1252
1480 DATA 5,195,56,173,2,195,237,254,194,141,1452
1490 DATA 17,195,169,0,233,0,141,18,195,32,1000
1500 DATA 164,194,141,10,195,32,183,194,173,17,1303
1510 DATA 195,141,6,195,173,4,195,141,12,195,1257
1520 DATA 173,5,195,141,13,195,173,6,195,141,1237
1530 DATA 14,195,169,0,141,15,195,173,252,194,1348
1540 DATA 133,88,173,253,194,133,89,173,254,194,1684
1550 DATA 133,87,32,231,192,173,253,194,205,1,1501
1560 DATA 195,208,17,173,252,194,205,0,195,208,1647
1570 DATA 9,173,254,194,205,2,195,208,1,96,1337
1580 DATA 32,149,194,144,44,173,14,195,24,109,1078
1590 DATA 6,195,141,14,195,173,15,195,105,0,1039
1600 DATA 141,15,195,173,252,194,24,109,8,195,1306
1610 DATA 141,252,194,173,253,194,109,9,195,141,1661
1620 DATA 253,194,32,149,194,240,2,176,164,173,1577
1630 DATA 12,195,24,109,4,195,141,12,195,173,1060
1640 DATA 13,195,109,5,195,141,13,195,173,254,1293
1650 DATA 194,24,109,10,195,141,254,194,76,25,1222
1660 DATA 194,173,13,195,205,15,195,208,6,173,1377
1670 DATA 12,195,205,14,195,96,173,18,195,48,1151
1680 DATA 11,240,3,169,1,96,173,17,195,208,1113
1690 DATA 248,96,169,255,96,173,18,195,16,21,1287
1700 DATA 73,255,141,18,195,173,17,195,73,255,1395
1710 DATA 141,17,195,238,17,195,208,3,238,18,1270
1720 DATA 195,96,32,253,174,32,212,225,169,0,1388
1730 DATA 133,253,169,32,133,254,162,0,160,64,1360
1740 DATA 169,253,32,216,255,96,32,253,174,32,1512
1750 DATA 212,225,169,97,133,185,169,0,32,213,1435
1760 DATA 255,96,0,0,0,0,0,0,0,0,0,351

```

A HIGH-RES HAT

To get you started using *Com-Grafix*, we've supplied an example program (see listing of *Hi-Res Hat*) that uses six of the 11 commands to plot a three-dimensional graph of a mathematical function that will look strikingly familiar! Because the math is so complex, the program takes about an hour and 15 minutes to execute. (If it were written purely in BASIC, however, it would occupy twice as many program lines and take twice as long to finish.) When done, it SAVES the image to disk under the filename "HAT". If you have a Datasette, change line 170 to read

```

170 SYS 49182,"HAT",1

```

before running the program. You can load the picture again for viewing by RUNNING the following BASIC program:

```

10 SYS 49155
20 SYS 49164,1,0
30 SYS 49185,"HAT",8 OR 30 SYS 49185,"HAT",1
40 GOTO 40

```

Have fun!

Commodore 64 w/Com-Grafix/Hi-Res Hat

```

9 REM --ENTER HI-RES GRAPHICS MODE--
10 SYS 49155
19 REM --CLEAR HI-RES SCREEN--
20 SYS 49161
29 REM --SET WHITE BACKGROUND, BLACK DOT COLOR--
30 SYS 49164,1,0
39 REM --LINES 40-130 CALCULATE X AND Y FOR PLOTTING--
40 P=160:Q=107:XP=144:XR=1.5*3.1415927:YP=56:YR=1
50 ZP=64:XF=XR/XP:YF=YR/YP:ZF=XR/ZP:XQ=XP/ZP
60 FOR ZI=-ZP TO ZP
70 ZT=ZI*XQ
80 XL=INT(0.5+SQR(XP*XP-ZT*ZT))
90 FOR XI=-XL TO XL
100 XT=SQR(XI*XI+ZT*ZT)*XF
110 YY=(SIN(XT)+0.4*SIN(3*XT))*YF
120 X=XI+ZI*P
130 Y=YY-ZI*Q:Y=199-Y
139 REM --PLOT X,Y--
140 SYS 49170,X,Y
150 NEXT XI
160 NEXT ZI
169 REM --SAVE HI-RES PICTURE TO DISK AS "HAT"--
170 SYS 49182,"HAT",8
179 REM --RETURN TO TEXT MODE--
180 SYS 49158
190 PRINT "FINISHED."
200 END

```

PROGRAMMING P.S.

Notes on previous months' programs

NOTE TO COMMODORE 64/VIC-20 OWNERS

Can't find the "▲" symbol on your computer's keyboard? Several readers have had trouble typing in lines like this one from the C 64 and VIC-20 versions of *New Year's Eve* (December 1984, pages 94 and 100):

```
30 BIN(X)=2^X
```

Commodore has its own version of the symbol that appears on most computers as "▲". (Most non-Commodore printers—including FAMILY COMPUTING'S—print it that way, too.) Commodore has added a tail to make it into an upward-pointing arrow. You'll find it on your C 64 or VIC keyboard right next to the asterisk key (don't confuse it with the CURSOR UP/DOWN key). In BASIC it means "raise to a power" (mathematical exponentiation). For example,

$$2^3 = 2 \times 2 \times 2 = 8$$

Apple/By Invitation Only (December 1984, page 114)

Unless you have a IIc, your Apple won't accept variable names in BASIC programs unless they're in all capital letters. So you must type in line 20 this way:

```
20 WL = 40:PI = 13:TRU = 1:TX = 1:DL = 100:TAS = " "
```

TI-99/4A/Perpetual Calendar (January 1985, page 74)

If 30 days hath September, why did we put 31? Line 2020 of the listing should be changed to read

```
2020 DATA July,31,August,31,September,30
```


Next 8 Pages!!

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DR. KURSOR'S KLINIC, page 67

GAME STRATEGY, page 68

MICROTONES, page 70

COMPUCOPIA, page 72

Edited by Anne Krueger

POK POWER

FOR THE COMPUTER GENERATION

Break Dancin' Fever!

Breakin' has hit street corners all across the country. Have you wondered *how* those fast-moving dancers with the fleet feet manage to do what they're doing, whatever it is that they're doing?! And have you come extremely close to straining all sorts of body parts trying the "tut" or the "windmill" in front of the hall mirror at home? Well, never fear... *Break Street*, from Creative Software, is here for computer users with the urge to hip-hop.



It's a dance battle against the Stingrays in Creative Software's *Break Street*.

Break Street is the most recent in the wave of break dancin' programs which began hitting the scene in June 1984 with Epyx' *Breakdance* and Screenplay's *Break Dancer*!

But there's a new twist: *Break Street*'s game characters (attired in Day-Glo high-tops) are based on a real break dancing group called The DeRoxy Crew. The game "moves" are based on The Crew's routines!

The group, which reigns in Seattle, won a Muscular Dystrophy Dance-Off and a trip to New York City. During their N.Y.C. visit, they stopped in at the K-POWER office, along with their guide, "Pop Master Fabel" (Jorge Pabon) of the movie *Beat Street* fame.

"Whiprock" (Walter Mathis), 16, explained how The DeRoxy Crew worked with Creative Software on *Break Street*. "We'd get going on our routine and then we'd get in a pose or a freeze and Creative would copy it. They videotaped all of our best moves."

Other real-life break dancers featured in the game are the "Double Trouble" duo (Wilbert Square, 19, and Ken Rogers, 16), "D-Dog" (Daryl Williams, 16), and "Showrock" (Rodney Rivers, 17). The Crew is rounded out by new member "Stretch" (Percy Lionel Washington, 17), who didn't appear in the computer game.

Break Street lets you see dance demos, create your own and play them back, slow down the street ac-



Photo: Anne Krueger

The DeRoxy Crew: "Double Duo" Square and Rogers, with "Stretch" Washington, and "Whiprock" Mathis.

tion so you can study the moves, and compete with your feet against other players or teams of players... all to an insistent rap beat.

To get points in the game, good dance transitions are the key. You'll learn how to go from "uprock" moves (standing-up moves like "tut," "wave," "moonwalk," and "pop-pin"), to "footwork" action (on-the-floor action like "head spins," "windmills," "scorpions," and "handspins"). The more original transitions you can fit into a routine, the more points you earn.

If you really want to show off with *Break Street*, better get a good joystick. High scorers get to sign on to the "Wall of Fame." *Break Street* is available for the Commodore 64.

Software Scoop

Get out your battered felt crusher and your trusty whip... and get ready to fill the boots of Indiana Jones in Mindscape's new *Indiana Jones in the Lost Kingdom*. Mindscape and the devious minds at Lucasfilm concocted this C 64 adventure game. As Indy, your mission is to retrieve an artifact containing the complete history and knowledge of a lost, forgotten civilization... New from Acti-

vision is *Mindshadow*—an illustrated text adventure for the Apple II series, IBM PC/PCjr, and C 64. Your goal? Forget lost civilization; this time around you're on a desert island, searching for your lost identity.



Avoid quicksand in *Mindshadow*, and listen to agents with glasses in *The Tracer Sanction*.

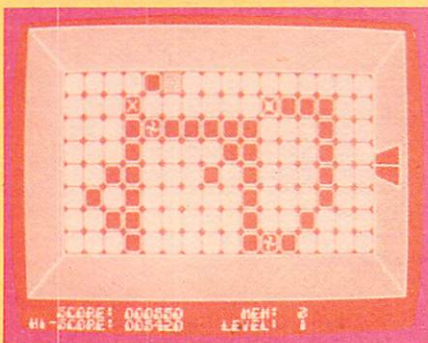
When you listen to a seashell, the game will tell you you're hearing Lorne Greene narrate a series on oceans! And, in Activision's new *The Tracer Sanction*, your job is to capture the "Wing"—the galaxy's most infamous criminal. You are the highest ranking agent of the Stellar Investigations Agency, so get going. The entire solar system is your investigative arena. *The Tracer Sanction* is for the Apple II series, IBM PC/PCjr, and C 64.

Annual Game-Design Contest Winners!!!!

Congratulations to the winners of K-POWER's Annual Game-Design Contest!! For months the K-POWER office has been deluged with envelopes and packages crammed with innovative games on disk and cassette. We've received adventure games, action games, text games, great arcade games, short games, and long games.

Every game entered got our judges' (Technical Editor John Jainschigg's and Technical Director Lance Paavola's) intense inspection. And the winners are . . .

GRAND-PRIZE WINNER: GLADIATOR



Mike Haller's grand-prize *Gladiator*.

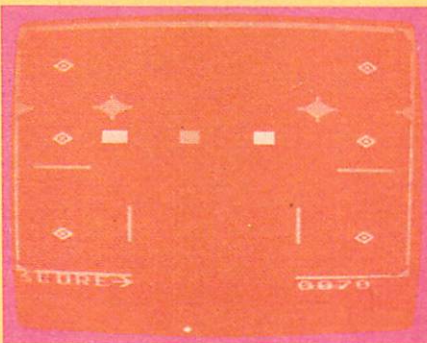
The first prize of an Apple IIe system with 64K (including a tilt-screen phosphorus monitor, a disk drive with controller, an 80-column card, and a pair of game controllers) goes to 17-year-old Mike Haller. Mike, who is from Red Cloud, Nebraska, got the idea for *Gladiator* one day when he was bored, he says. It took

him four to five months to finish this Apple II plus game, which he programmed in machine language.

Gladiator pits you (an Intergalactic Star Pilot) against a computer opponent in a tricky, strategic game of gladiator against gladiator. Mike's documentation explains, "You travel to the planet Suxxon 436 in order to learn all you can about its cruel dictator, Baron Alvin III. Your spaceship is seized by a tractor beam and pulled to an enemy space station. Pain-multiplier rays are sent through your ship, knocking you unconscious. When you wake up, you find yourself a captive of the Baron . . . and are on your way to the Pit . . ."

SECOND PRIZE: BOUNCE

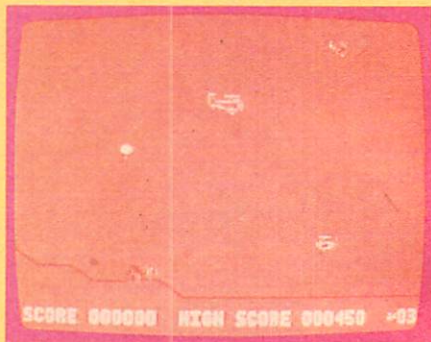
The second prize of a Volksmodem goes to Chris Drouin, 16, for his game called *Bounce*. This arcade-style simulation is a take-off on the game of *Pong*, made famous by Nolan Bushnell at Atari. Chris, from Sumner, Maine, wrote *Bounce* in machine-language on his 32K Atari.



Second-prize winner: *Bounce*, by Chris Drouin.

THIRD PRIZE: RICHTOFEN'S REVENGE

Glenn Ohlinger Jr., of Girard, Ohio, wins \$100 worth of software for his adventure game called *Richtofen's Revenge*. Glenn wrote this Commodore 64 game in machine language.



Richtofen's Revenge: Glenn Ohlinger Jr.'s third-prize winner.

Tons of other entries deserve honorable mention. Of particular note are: **Space Belt**—a C 64 game designed by James Watt, 13, of Clearwater, Florida. **Power Games**—four Texas Instruments games by Mike Stanfill, 30, of Dallas, Texas.

Gunner—an IBM game by Bill Johnsen, 14, of Parker, Colorado.

Wizard—an Atari game by Larry Nocella, 14, of Woodbury Heights, New Jersey.

Alpha Attack—an Atari game by Bhargav Upender, 17, of Niantic, Connecticut.

H.M.S. K-POWER—a VIC-20 game by Toby Ealden, 16, of Pittsburgh, Pennsylvania.

K-POWER wants to thank everyone who entered the "Annual Game-Design Contest."

LOGON

L E T T E R S

LODE RUNNER FAN

My grandpa receives K-POWER and he lets me read it. It's the greatest . . . ! Now my question. I have the Broderbund software game *Lode Runner*. I have seen *Championship Lode Runner* advertised. What's the difference between the two? Are they the same except *Championship Lode Runner* is harder? Can you generate your own games in *Championship Lode Runner*? Thanks!

SCOTT SASSMANN, 15
Belle, Missouri

Dear Scott

According to the *Special Ks*—K-POWER's software experts who are big, BIG fans of both *Lode Runner* games—you can't generate your own levels or edit existing levels on *Championship Lode Runner*. But you can start at any level you want, and you can save your current position.

THE EDITORS

POKES FROM DOWN UNDER

My name is Jason Bowes and I live in Australia. While using my VIC-20,

I found some useful POKES. Here is a list of some of them:

POKE 808,127 disables the RUN/STOP key.

POKE 808,112 re-enables the RUN/STOP key.

POKE 650,255 makes every key repeat.

POKE 650,0 sets repeat function to normal.

POKE 649,0 disables your keyboard.

POKE 649,10 re-enables the keyboard.

JASON BOWES

Townsville,

Queensland, Australia

DOCTOR KURSOR'S KLINIC

What is a flowchart?

DR. KURSOR: At first glance, a flowchart may look like a crazy jumble of strange symbols. But with this info on what those symbols mean, you'll discover it's very easy to follow a flowchart—or to make one yourself.

A flowchart is a way to write down the solution to a problem. It tells you, step by step, what you need to do and what decisions you have to make to get something done.

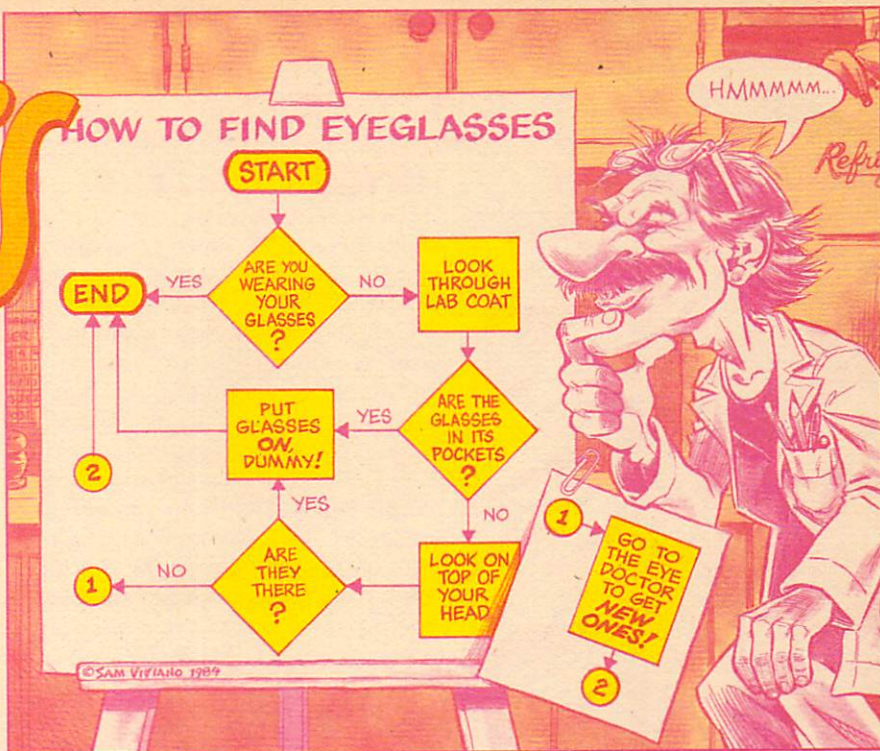
To "read" a flowchart, begin by looking for a box with rounded ends labeled "START." From there, just follow the arrows . . . it's easier than following a road map! Along the way to the "END" box (which also has rounded ends), you'll meet several other shapes.

A rectangle tells you what action you need to perform next—such as "Take a bath" or "Add 3 to x."

A diamond is a crossroads. There usually will be two paths out of the diamond, one labeled "Y" or "YES" and the other "N" or "NO." When you answer the question inside the diamond—such as "Is the water boiling yet?" or "Is x less than 5?"—you know whether to take the "Y" or "N" path.

If you reach a circle with a number in it, that means the person who wrote the flowchart ran out of room! Look for the same circled number somewhere else on the chart—maybe on another page—and continue from there.

Some programmers use special symbols for computer processes like subroutines, input, and output, but basically all you need to know about is START, END, "do-this" rectangles, "decide" diamonds, and "jump" circles to understand—or create—any flowchart. Flowcharts are an easy



way to learn how someone else solved a problem. But trying to write your own flowchart can actually help you organize your thoughts and, by breaking down your problem into manageable pieces, solve it.

And, if you're trying to write a computer program, it's much easier if you have a flowchart to work from. Most programmers do a flowchart in their heads while creating a program, whether or not they write it down. Yet flowcharts aren't limited to programming; you can use them to help you figure out how to do just about anything, from planning a trip to asking someone for a date. Try it!

Can you find out how much memory a program takes up? If so, how?

DR. KURSOR: Sure! Go into BASIC and use the NEW command to clear memory. Then

| FOR A . . . | ENTER . . . |
|---------------------|--------------|
| TI w/Extended BASIC | SIZE |
| TI w/TI BASIC | (see below) |
| Timex | (see below) |
| TRS-80 | PRINT MEM |
| most other micros | PRINT FRE(0) |

This'll tell you how many bytes of RAM are available for your BASIC program. (If the result is negative, add 65536.)

Now load the program. But don't RUN it; instead, check available

memory again. Just subtract one number from the other and you'll find out how big your program is.

If you RUN the program and then check again, you'll find your program has grown! That's because most computers don't set aside working ("scratch pad") space for a program until it has RUN.

On a Timex, load your program first, then enter PRINT (PEEK 16396 + 256 * PEEK 16397) - 16509. This'll print the size, in bytes, of the program in memory.

Finally, if you have a TI without Extended BASIC, type NEW, then enter and RUN this program:

```

1 A = A + 8
2 GOSUB 1

```

When the program stops with the message * MEMORY FULL IN 1, enter PRINT A. Write down the result.

Then load your program and add lines 1 and 2 to the beginning. (Use some other letter for A if A appears in your program.) RUN the program, and when it stops, PRINT A again. The difference is the size of your program.

(Remember to delete lines 1 and 2 when you're done!)

Need an answer to a high-tech question?


Send your questions to Dr. Kursor's Clinic, c/o K-POWER, 730 Broadway, New York, NY 10003.

TIPS, TRICKS, AND HINTS


GHOSTBUSTERS



The Underground has just released the accompanying map. It shows the important buildings along Fifth Avenue between 42nd and 60th Streets. —DAMON OSGOOD, 16, *Brooklyn, New York*

 If your PK Energy Detector warns of an approaching Slimer, bide your time by cruising and freezing some Roamers. After the detec-



 The sooner you catch a Slimer, the more money you'll get. You may, however, want to sacrifice a few hundred dollars and pick up a few frozen Roamers on your way to a house. —THE SPECIAL KS



M.U.L.E.

Electronic Arts. Strategy/simulation. Your mission: To establish the most profitable colony on a distant planet. You'll grow crops, mine for minerals, hunt the wampus, and trade goods at weekly auction. (Hints and game for Atari, Commodore 64.)

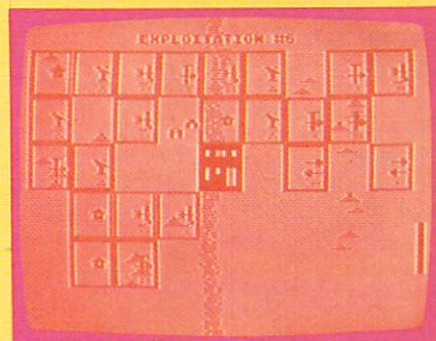
➤ To get the price of Smithore to rise, try buying M.U.L.E.s and just letting them go.

➤ Mechtrons can be clever; during land auctions they'll suddenly back down, forcing you to pay a ridiculously high price. So, after the price begins to go over \$1,000, beware.

➤ The higher the pitch of the note made by the wampus when it emerges from the caves, the higher it will appear on the screen.

➤ In the beginning, buy all the land you can, leaving yourself enough money to buy a M.U.L.E. As the game progresses, your land will become much more valuable.

➤ In *M.U.L.E.*, the passage of time is represented by the depletion of your food resources: The more time you use in any turn, the more food you eat. You'll find that near the end of the game, if you don't plan to make any major changes in your land organization, you won't



Colonize a remote planet, mine for Smithore, raise crops, and hunt the wampus in *M.U.L.E.*

need to buy food. You can save your resources and use them in more profitable ways. —SPECIAL Ks

H I N T H O T L I N E

SEVEN CITIES OF GOLD, Electronic Arts. Role-playing adventure. Your mission: To voyage to the New World seeking riches and glory as a Spanish explorer. Achieve fortune and fame through bloody conquest or peaceful negotiations with the populations you encounter. Use the scenario on the disk, or have the computer create totally new worlds. (Hints and game for Apple, Atari, IBM.)

➤ It's often wise to convert a village or city into a mission, instead of conquering it. To do this, go up to the chief and AMAZE him. Then offer him gifts. If he isn't converted the first time, leave the village, come back, and try again.

➤ If you're on friendly terms with the natives, occasionally stop your party in the wilderness. Wait to find out if your pack-bearers have anything to say. Sometimes they'll guide you right to the Incan capital.

➤ If you create enough worlds, you might meet civilizations more advanced than the Incas. —DAVID LANGENDOEN, 16, Brooklyn, New York

XYPHUS, Penguin. Role-playing adventure. Your mission: To put together a band of up to four characters and venture through seven scenarios. Each succeeding scenario takes you closer to your final objective, finding and slaying the demon-lord, Xyphus. (Hints and game for

Apple, Commodore 64, and IBM.)

➤ Never fight on the offensive against powerful creatures or groups. Lure them into the terrain of your choosing. That way you'll be able to pick them off rather than fighting them *en masse*.

➤ Two spells will harm the Spider People of Selcham Pass: Ciega and Matamosca.

➤ Don't be afraid to split up your characters. In some scenarios, you'll have to. —JAMES DELSON, FAMILY COMPUTING games critic, New York, New York

SHERWOOD FOREST, Phoenix. Graphic adventure. Your mission: To sally forth as Robin Hood, rescue and marry Maid Marion, and finally gain entrance into the castle that will be your home. (Hints and game for Apple.)

➤ The tailor's only fee is solitude.

➤ Little John only knows a green Robin Hood.

➤ Finding a needle in a haystack is almost impossible. Ashes are easier to search. —MITCHELL WELLS, 13, San Gabriel, California

ONE-ON-ONE, Electronic Arts. Arcade/strategy. Your mission: To play the part of Dr. J or Larry Bird and outmaneuver your opponent or the computer to score more points.

(Hints and game for Apple, Atari, C 64 and IBM PC/PCjr.)

➤ When your fatigue level gets too high, go for steals and medium-range jumpers.

➤ Hold on to the ball if you get it in the last few seconds of a quarter. Next quarter, you'll start with the ball and a new, lower fatigue level. —SCOTT BELAN, 15, Elkins, West Virginia

AMAZON, Trillium. Graphic adventure. Your mission: To find the lost city of Chak deep within the Amazon jungle and recover the emeralds there. (Hints and game for Apple and Commodore 64.)

➤ There's more than one way to use a gun.

➤ Clothes are meant to be worn, so put them on at the first opportunity. —SPECIAL Ks

Calling all experts! Games are great but they're a pain in the you know where when you're stumped. All it takes is a tip or some fancy technique and you can go on and enjoy a game for hours. If you've got a style that works, a strategy to help you through those tough spots, or if you consider yourself an expert in your own right, show us what you've got. We'll pay you \$10 for each tip or gem of strategy we use. Send them to Hint Hotline, c/o K-POWER, 730 Broadway, New York, NY. Please, no more hints for *Zork* or *Pac-Man*!



MUSIC PROGRAMS BY JOEY LATIMER

A computer is a great instrument to have around when you get crazy musical ideas in the middle of the night. The other night I was reading a music book about fugues for three voices and I thought to myself, "Gee, it would be great to wake up my wife and baby (my backup group) and write a 'Family Fugue.'" Something told me they wouldn't go for it and I thought, "Another great idea down the drain!"

Since my backup group was sleeping, I called upon my trusty computer to help me with the musical experiment. The result is a swinging little program I called the *Techno-Rock Fugue*. It's a short, multivoiced fugue with a rock beat and a few techno-twists thrown in. **MUSICAL NOTE:** A fugue is defined as "a musical composition in which different voices successively repeat the theme." In fugues—as in rounds and canons such as "Row, row, row your boat . . ."—the melody of the song is sung by several staggered voices at the same time.



ATARI/TECHNO-ROCK FUGUE

```
10 DIM V1(128),V2(128),V3(128),DR(128),A(3),B(3),C(3)
20 POKE 752,1:PRINT CHR$(125);"TUNING UP ... PLEASE WAIT."
30 FOR X=1 TO 128
40 READ V:V1(X)=V
50 IF X>64 AND X<89 THEN 70
60 V1(X+1)=V:X=X+1
70 NEXT X
80 FOR X=1 TO 128
90 IF X<33 THEN V2(X)=0:GOTO 130
100 READ V:V2(X)=V
110 IF X>95 AND X<121 THEN 130
120 V2(X+1)=V:X=X+1
130 NEXT X
140 FOR X=1 TO 128
150 IF X<65 THEN V3(X)=0:GOTO 180
160 READ V:V3(X)=V
170 V3(X+1)=V:X=X+1
```

```
180 NEXT X
190 FOR X=0 TO 112 STEP 16:FOR Y=1 TO 16
200 IF Y=1 OR Y=9 THEN DR(X+Y)=60:GOTO 230
210 IF Y=5 OR Y=13 OR Y=15 THEN DR(X+Y)=4:GOTO 230
220 DR(X+Y)=0
230 NEXT Y:NEXT X
240 FOR X=1 TO 3
250 READ I,F,S:A(X)=I:B(X)=F:C(X)=S
260 NEXT X
270 PRINT CHR$(125):SETCOLOR 1,1,7:SETCOLOR 2,2,13
280 POSITION 9,11:PRINT "THE TECHNO-ROCK FUGUE"
290 FOR Y=1 TO 3:Z=1:FOR X=A(Y) TO B(Y) STEP C(Y)
300 IF Y>2 OR DR(Z)>0 OR X>64 THEN SOUND 0,DR(Z),8,3
310 SOUND 1,V1(X),10,4:SOUND 2,V2(X),10,4:SOUND 3,V3(X),10,4
320 IF Y=2 AND X>65 AND X<88 THEN SOUND 0,0,0,0
330 FOR D=1 TO 20:NEXT D:SOUND 0,0,0,0
340 IF X<64 THEN SOUND 1,0,0,0:IF X>32 THEN SOUND 2,0,0,0
350 Z=Z+1:NEXT X:NEXT Y:GOTO 290
1000 DATA 121,108,91,96,81,91,96,108,121,108,91,96
1010 DATA 136,136,136,136,121,108,96,81,96,108,81,81
1020 DATA 96,96,108,96,108,108,108,81,72,91,81,96
1030 DATA 91,108,96,81,72,91,81,96,91,108,96,81,72,91
1040 DATA 81,96,91,108,96,91,91,91,91,81,144,121,128
1050 DATA 108,121,128,144,81,144,121,128,91,91,91,91
1060 DATA 81,72,60,64,53,60,64,72,81,72,60,64,91,91
1070 DATA 91,91,81,72,64,53,64,72,53,53,64,64,72,64
1080 DATA 72,72,72,72,53,47,60,53,64,60,72,64,53,47
1090 DATA 60,53,64,60,72,64,53,47,60,53,64,60,72,64
1100 DATA 60,60,60,60,243,217,182,193,162,182,193,217
1110 DATA 243,217,182,193,136,136,136,136,243,217,193
1120 DATA 162,193,217,162,162,193,193,217,193,217,217
1130 DATA 217,217,1,128,1,120,57,-1,65,128,1
```



COMMODORE 64/TECHNO-ROCK FUGUE

```
10 DIM H1(128),L1(128),H2(128),L2(128),H3(128),L3(128)
,A(3),B(3),C(3)
20 PRINT CHR$(147);"TUNING UP ... PLEASE WAIT."
30 S=54272:FOR X=1 TO 24:POKE S+X,0:NEXT X
40 POKE S+5,68:POKE S+6,68:POKE S+12,68
50 POKE S+13,131:POKE S+19,18:POKE S+20,184
60 FOR X=1 TO 128
70 READ H1(X),L1(X)
80 IF X>64 AND X<89 THEN 100
90 H1(X+1)=H1(X):L1(X+1)=L1(X):X=X+1
100 NEXT X
110 FOR X=1 TO 128
120 IF X<33 THEN H2(X)=0:L2(X)=0:GOTO 160
130 READ H2(X),L2(X)
140 IF X>95 AND X<121 THEN 160
150 H2(X+1)=H2(X):L2(X+1)=L2(X):X=X+1
160 NEXT X
170 FOR X=1 TO 128
180 IF X<65 THEN H3(X)=0:L3(X)=0:GOTO 210
190 READ H3(X),L3(X)
200 H3(X+1)=H3(X):L3(X+1)=L3(X):X=X+1
210 NEXT X
220 FOR X=1 TO 3
230 READ A(X),B(X),C(X)
240 NEXT X
250 POKE 53281,12:PRINT CHR$(147);
260 POKE 214,11:PRINT:POKE 211,9:PRINT CHR$(144);"THE TECHNO-ROCK FUGUE"
270 POKE S+24,15
280 FOR Y=1 TO 3:FOR X=A(Y) TO B(Y) STEP C(Y)
290 POKE S+1,H1(X):POKE S+0,L1(X)
300 POKE S+8,H2(X):POKE S+7,L2(X)
310 POKE S+15,H3(X):POKE S+14,L3(X)
320 POKE S+4,33:POKE S+11,33:POKE S+18,33
330 FOR D=1 TO 20:NEXT D
340 POKE S+4,32:POKE S+11,32:POKE S+18,32
350 NEXT X,Y:GOTO 280
```



```

1000 DATA 16,195,18,209,22,96,21,31,25,30,22,96,21,31
1010 DATA 18,209,16,195,18,209,22,96,21,31,14,239,14
1020 DATA 239,14,239,14,239,16,195,18,209,21,31,25,30
1030 DATA 21,31,18,209,25,30,25,30,21,31,21,31,18,209
1040 DATA 21,31,18,209,18,209,18,209,18,209,25,30,28
1050 DATA 49,22,96,25,30,21,31,22,96,18,209,21,31,25
1060 DATA 30,28,49,22,96,25,30,31,31,22,96,18,209,21
1070 DATA 31,25,30,28,49,22,96,25,30,21,31,22,96,18
1080 DATA 209,21,31,22,96,22,96,22,96,22,96,25,30,14
1090 DATA 24,16,195,15,210,18,209,16,195,15,210,14,24
1100 DATA 25,30,14,24,16,195,15,210,22,96,22,96,22,96
1110 DATA 22,96,25,30,28,49,33,135,31,165,37,162,33
1120 DATA 135,31,165,28,49,25,30,28,49,33,135,31,165
1130 DATA 22,96,22,96,22,96,22,96,25,30,28,49,31,165
1140 DATA 37,162,31,165,28,49,37,162,37,162,31,165,31
1150 DATA 165,28,49,31,165,28,49,28,49,28,49,28,49,37
1160 DATA 162,42,62,33,135,37,162,31,165,33,135,28,49
1170 DATA 31,165,37,162,42,62,33,135,37,162,31,165,33
1180 DATA 135,28,49,31,165,37,162,42,62,33,135,37,162
1190 DATA 31,165,33,135,28,49,31,165,33,135,33,135,33
1200 DATA 135,33,135,8,97,9,104,11,48,10,143,12,143
1210 DATA 11,48,10,143,9,104,8,97,9,104,11,48,10,143
1220 DATA 14,239,14,239,14,239,14,239,8,97,9,104,10
1230 DATA 143,12,143,10,143,9,104,12,143,12,143,10
1240 DATA 143,10,143,9,104,10,143,9,104,9,104,9,104
1250 DATA 9,104,1,128,1,120,57,-1,65,128,1

```



VIC-20/TECHNO-ROCK FUGUE

```

10 DIM V1%(128),V2%(128),V3%(128),A$(3),B$(3),C$(3)
20 PRINT CHR$(147);"TUNING UP..."
30 PRINT:PRINT " PLEASE WAIT."
40 FOR X=1 TO 128
50 READ V1%(X):V1%(X)=V1%(X)+200
60 IF X>64 AND X<89 THEN 80
70 V1%(X+1)=V1%(X):X=X+1
80 NEXT X
90 FOR X=1 TO 128

```

```

100 IF X<33 THEN V2%(X)=0:GOTO 140
110 READ V2%(X):V2%(X)=V2%(X)+200
120 IF X>95 AND X<121 THEN THEN 140
130 V2%(X+1)=V2%(X):X=X+1
140 NEXT X
150 FOR X=1 TO 128
160 IF X<65 THEN V3%(X)=V3%(X):GOTO 190
170 READ V3%(X):V3%(X)=V3%(X)+200
180 V3%(X+1)=V3%(X):X=X+1
190 NEXT X
200 FOR X=1 TO 3
210 READ A$(X),B$(X),C$(X)
220 NEXT X
230 POKE 36879,158:PRINT CHR$(147);
240 POKE 214,10:PRINT:PRINT CHR$(144);" TECHNO-ROCK FUGUE"
250 POKE 36878,3:FOR Y=1 TO 3:Z=1:FOR X=A$(Y) TO B$(Y)
STEP C$(Y)
260 IF Z=1 OR Z=9 THEN POKE 36877,220
270 IF Z=5 OR Z=13 OR Z=15 THEN POKE 36877,240
280 POKE 36875,V1%(X):POKE 36876,V2%(X):POKE 36874,V3%(X)
290 FOR D=1 TO 35:NEXT D:POKE 36877,0
300 IF X>64 THEN FOR D=1 TO 10:NEXT D:GOTO 320
310 POKE 36875,0:POKE 36876,0
320 Z=Z+1:IF Z=17 THEN Z=1
330 NEXT X,Y:GOTO 250
1000 DATA 25,28,32,31,35,32,31,28,25,28,32,31
1010 DATA 21,21,21,21,25,28,31,35,31,28,35,35
1020 DATA 31,31,28,31,28,28,28,28,35,37,32,35
1030 DATA 31,32,28,31,35,37,32,35,31,32,28,31
1040 DATA 35,37,32,35,31,32,28,31,32,32,32,32
1050 DATA 35,19,25,23,28,25,23,19,35,19,25,23
1060 DATA 32,32,32,32,15,19,25,23,28,25,23,19
1070 DATA 15,19,25,23,09,09,09,09,15,19,23,28
1080 DATA 23,19,28,28,23,23,19,23,19,19,19,19
1090 DATA 28,31,25,28,23,25,19,23,28,31,25,28
1100 DATA 23,25,19,23,28,31,25,28,23,25,19,23
1110 DATA 25,25,25,25,25,28,32,31,35,32,31,28
1120 DATA 25,28,32,31,38,38,38,38,25,28,31,35
1130 DATA 31,28,35,35,31,31,28,31,28,28,28,28
1140 DATA 1,128,1,120,57,-1,65,128,1

```

M I C R O N O T E S

Rock musicians have caught the personal-computer craze! **The Grateful Dead's** drummer, **Micky Hart**, and bassist, **Phil Lesh**, are attached to a **Hewlett-Packard 110** portable. They used it on-stage during their latest tour—hooked into a central sound system to adjust the pitch and tone of their instruments, and to control sound effects. When not in the spotlights, the Grateful Dead use the HP portable to send electronic mail to friends, family, and fans; and to write lyrics and musical notes.

The first music club we've heard of for C 64 owners



The Grateful Dead: Hooked on computers.

won't elect officers, and won't hold meetings. Instead, members of **Sight & Sound's C-64 Music Club** will get—for a one-time, \$10 fee—catalogs offering discounts and special offers on the company's music software, and some bargains on third-party peripherals, such as Casio amps. Listings in the first catalog (it will be published two or three times a year) include **Kawasaki Synthesizer**, **Music Processor**, and **3001 Sound Odyssey**—each for \$5 off the retail price. To join, write: Randy Edmonds, C-64 Music Club, P.O. Box 310, New Berlin, WI 53151; or call (800) 558-0912 ext. 49.

Even if you don't have any piano experience under your belt, you can compose music on an IBM PC or PCjr. All you'll need is the **TuneSmith/PC** (\$49.95), a full-screen editor from **Blackhawk Data**; it uses the music language built into the PC's BASIC. You can compose anything from classical to pop music, play at various speeds, move up and down octaves, move from legato to staccato, and repeat certain passages. What you're editing shows on the screen, and a dancing note appears on the screen's right. **TuneSmith/PC** will interface with other software, which, Blackhawk says, third-party companies are developing. Blackhawk Data Corp., 307 N. Michigan Ave., Chicago, IL 60601; (312) 236-8473.

—LINDA WILLIAMS

COMPU COPIA

SHORT - SHORT PROGRAMS

ADAM/CROSSED WORDS

```
10 HOME
20 PRINT "Please input any string"
30 INPUT "(e.g., your name). ";a$
40 HOME
50 x = INT(RND(1)*22)+1:y = INT(RND(1)*31)+1:vx = INT(
RND(1)*3)-1:vy = INT(RND(1)*3)-1
60 FOR i = 1 TO LEN(a$)
70 VTAB x:HTAB y:PRINT MID$(a$,i,1);
80 x = x+vx:y = y+vy
90 IF x < 1 OR x > 22 OR y < 1 OR y > 31 THEN i = LEN(
a$)
100 NEXT i:GOTO 50
```

TIMEX SINCLAIR 1000 & 1500/CROSSED WORDS

```
10 SLOW
20 PRINT "PLEASE INPUT ANY STRING"
30 PRINT "(E.G., YOUR NAME)."
40 INPUT AS
50 CLS
60 LET X=INT (RND*21)
70 LET Y=INT (RND*32)
80 LET VX=INT (RND*3)-1
90 LET VY=INT (RND*3)-1
100 FOR I=1 TO LEN AS
110 PRINT AT X,Y;AS(I)
120 LET X=X+VX
130 LET Y=Y+VY
140 IF X<0 OR X>21 OR Y<0 OR Y>31 THEN LET I=LEN AS
150 NEXT I
160 GOTO 60
```

TRS-80 COLOR COMPUTER/CROSSED WORDS

```
10 CLS: CLEAR 500
20 PRINT "PLEASE INPUT ANY STRING"
```

```
30 INPUT "(E.G., YOUR NAME)";AS
40 CLS
50 X=RND(15)-1:Y=RND(32)-1:VX=RND(3)-2:VY=RND(3)-2
60 FOR I=1 TO LEN(AS):PRINT AT X+32+Y,MID$(AS,I,1);
70 X=X+VX:Y=Y+VY
80 IF X<0 OR X>14 OR Y<0 OR Y>31 THEN I=LEN(AS)
90 NEXT I:GOTO 50
```

TRS-80 MODEL III/CROSSED WORDS

```
10 CLS: CLEAR 500
20 PRINT "PLEASE INPUT ANY STRING"
30 INPUT "(E.G., YOUR NAME)";AS
40 CLS
50 X=RND(15)-1:Y=RND(64)-1:VX=RND(3)-2:VY=RND(3)-2
60 FOR I=1 TO LEN(AS):PRINT AT X+64+Y,MID$(AS,I,1);
70 X=X+VX:Y=Y+VY
80 IF X<0 OR X>14 OR Y<0 OR Y>63 THEN I=LEN(AS)
90 NEXT I:GOTO 50
```

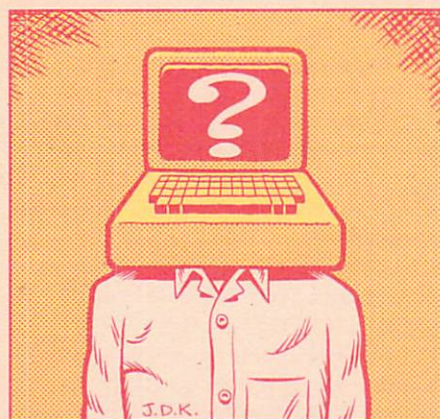
CUSTOMIZE YOUR 3-D PLOTTER!

If you liked last month's 3-D Surface Plotter program (page 92), you'll love it when it draws pictures you design!

The key's in line 60. You can change what's to the right of the equal sign to just about any function involving X and Y . . . just so long as you don't end up dividing by zero. But you can come up with some really far-out shapes! For starters, try

```
60 Z=X+Y+50*((X>12)*(X<12)*(Y>5)*(Y<5))
```

COMPUTER TRIVIA CONTEST



Are you a trivia talent? Think you know everything there is to know about computers? Then check out K-POWER's Computer Trivia Quiz! We challenge you to answer every question correctly. We'll randomly pick two winners from all the correct entries we receive by March 22. Lucky winners will be sent Suncom's PQ: *The Party Quiz Game*, which includes special controllers that let up to four teams take on one another to see who can answer questions fast-

est. So give it a try! Send your entry c/o K-POWER, 730 Broadway, New York, NY 10003.

1. What are the names of the famous sidekicks in Infocom's *Planetfall* and in Trillium's *Amazon*?
2. What does BASIC really stand for?
3. What is the full name of the woman who has a computer language named after her? And what was her part in computing history?
4. Which word means "a sloppy computer program"?
Baud _____ Buffer _____ Kluge _____ Deuce _____
5. What do the designers at Ozark Softscape (they designed *M.U.L.E.*) do to brainstorm for game ideas?
6. Why did the designers at Atari build in a feature that automatically changes the screen color after a certain amount of time?
7. Who wrote and recorded that great song: "BASIC Ain't the Language of Love"?
8. Who is this guy? (below)



Name _____ Age _____
Address _____
City _____ State _____ Zip _____
Telephone () _____ Male _____ Female _____
Computer(s) I use: _____

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learning both challenging and fun. In fact, you probably grew up reading Scholastic books and magazines in school. Nobody else knows kids like we do and it shows in our new family of products. That's the Scholastic Advantage.

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Agent U.S.A. available in Apple, Atari, Commodore and IBM. *Story Maker* and *Microzine* available in Apple. *Math Man* and *Story Tree* available in Apple and IBM. *Operation: Frog* available in Apple and Commodore. *Spelldiver* available in Apple, Atari and Commodore.

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WHAT'S IN STORE

NEW HARDWARE ANNOUNCEMENTS*

TRS-80 MODEL 200 • NEC PC-8400 • HUSH 80 PRINTER

COMPUTERS

BATTLE OF THE LAPS!

The lap-top wars continue! In one corner sits Tandy/Radio Shack, whose TRS-80 Model 100 (with built-in modem and software, and up to 32K) is definitely the best-selling little portable in Texas (and points north, south, east, and west). By all accounts, the Model 100 opened up the whole lap computer market. In the other corner looms the challenger, NEC, whose 32K PC-8201 (with built-in software) is almost identical to the Model 100 in look, use, and feel.

Now, both companies have improved their first-generation portables. This time, both have built-in

*These products have been announced by manufacturers, but are not necessarily in the stores yet. Some products may still be under development, and others may be in test markets only. Call or write the manufacturer for expected date of delivery.

modems! And new, improved software! Like their predecessors, both new computers have liquid-crystal display (LCD) screens, run on batteries, and retain memory even when the power is turned off. Take a look at these truly "personal" personal computers.

TRS-80 Model 200 Portable

MANUFACTURER: Tandy/Radio Shack,
1800 One Tandy Corp., Ft. Worth,
TX 76102; (817) 338-2393
PRICE: \$999

The Model 200's tilt-up screen displays 16 lines by 40 characters. The 200 comes with 24K RAM, and can be expanded to 72K RAM in banks of 24K (\$249.95 each). Each RAM bank has menu slots for 46 file entries, and the user can copy files to other banks. For these tasks there's both a BANK switch function and a COPY function.

The 72K ROM is expandable to 104K (one 32K optional ROM). Besides BASIC, word processing, and



communications software, the top-selling spreadsheet *Multiplan* also is stored in this permanent memory. There also are address and scheduling programs built in, and a four-function calculator accessible from the other software in RAM.

The Model 200 has a built-in 300-baud modem, a parallel printer port, an RS-232 port, and a bar-code-reader port. The keyboard has eight function keys.

New features include the KILL function (previously, you had to "kill" a

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(IL 1-312-459-8000)

file in BASIC), and a LIST function in TEXT (word processing), which performs a search of names or words from any text file. The text NOTE.DOC file used in conjunction with the scheduling program will hold up to 255 date/time combinations, each of which will sound an alarm and even "wake up" the machine when the power isn't on.

The 200 weighs 4.5 pounds, and can be used with a cassette or disk drive and monitor. An optional carrying case (\$39.95) is available.

NEC PC-8400 Series

MANUFACTURER: NEC Home Electronics, Inc., 1401 Estes Ave., Elk Grove Village, IL 60007; (312) 228-5900
PRICE: \$999

NEC's PC-8401A has a 16-line by 80-character screen display, a built-in 300-baud modem, and built-in software. The computer comes with a sizable 64K RAM, which cannot be expanded. For built-in software, the PC-8401A has *WordStar-to-Go* (a lap version of the best-selling *WordStar* word-processing program); *Calc*; *Personal Filer*; *TELCOM*, a telecommunications program; and a selection of CP/M utilities (others can be loaded by the user). The keyboard has five function keys.

The 8401A has a standard parallel



port to hook up with most printers, and an RS-232 serial port. Options include a CRT adapter (to hook up a monitor), a 3.5-inch disk drive, and a 1200-baud modem cartridge that plugs into the back of the unit. The 8401A weighs 4.7 pounds.

PRINTERS

HUSH 80

MANUFACTURER: Ergo Systems, Inc., 26254 Eden Landing Road, Hayward, CA 94545-3718; (415) 786-3746
PRICE: \$139

With the recent onslaught of briefcase-size computers, it was only a matter of time before totable peripherals hit the market. Ergo Systems is one of the first out of the gate—with a dot-matrix thermal printer that measures 11.6 × 5.5 × 2.8. The printer is quiet, reliable, easy to use, and portable.

With its small size, and optional battery pack, the HUSH 80 will fit in a briefcase and print wherever the user goes. With paper installed (a 100-foot roll is standard) and battery pack, the printer weighs 3 pounds.

The 80-column, 80-character-per-second (extremely fast for the price) printer comes in three models to interface with most personal computers: the HUSH 80CD Commodore interface, and, for \$20 extra, the HUSH 80P Centronics type parallel, and the HUSH 80S RS-232 serial interface. Ergo Systems is one of the few printer companies to offer this benefit.

Once the six-month warranty has elapsed, Ergo also offers a lifetime service policy, featuring a \$25-\$60 fixed-fee repair program based on the age of the printer. **FC**

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WHAT'S IN STORE SOFTWARE REVIEWS

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: **O** = 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/APPLICATIONS

| Title Manufacturer Price | Brief description | Hardware requirements | Backup policy | Ratings | | | | | |
|---|--|---|---|-------------|-------------|-------------|-------------|----|-------------|
| | | | | O | D | EH | GQ | EU | V |
| THE HOME CATALOGER Arrays/Continental Software 11223 South Hindry Ave. Los Angeles, CA 90045 (213) 410-9466 \$49.95 ©1984 | Store, search, and sort through information in small-scale electronic file system, appropriate for keeping track of home inventory, address lists, and collections. —ODISIO | Reviewed on C 64 (d.). Also for Apple IIe/IIc, 128K (d.); IBM PCjr, 128K (d.). | 90-day warranty (includes user-damaged); \$20 fee extends warranty to 1 year. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | N/A | E | ★ ★ ★ |
| HOMEWORD FILER Sierra, Inc. P.O. Box 485 Coarsegold, CA 93614 (209) 683-6858 \$99.99 ©1984 | An electronic file system which uses icons, or pictures, to help beginners learn to store, sort, retrieve, and print out addresses, inventories, and even short form letters. —RASKIN | IBM PC/PCjr, 64K (d.). Versions planned for Apple II series; C 64. | 90-day warranty (includes user-damaged); \$10 fee thereafter or for backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| MASK PARADE Springboard Software 7807 Creekridge Circle Minneapolis, MN 55435 (800) 328-1223 \$39.95 ©1984 | A simple utility program lets you create and print out (w/printer) face masks, hats, badges, jewelry, and feet. † —FRANK | Reviewed on Apple II series, 48K (d.). Also for IBM PC with color card /PCjr, 64K (d.). | 30-day warranty (if not fully satisfied); \$5 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| THE MILLIKEN WORD PROCESSOR Milliken Publishing P.O. Box 21579 St. Louis, MO 63132-0579 (314) 991-4220 \$69.95 ©1984 | Kids new to word-processing learn workings and functions of such features as "delete," "block move," "clear," etc. Novices can word-process term papers, letters, and more. † —BUMGARNER | Apple II series, 48K (disk). | 90-day warranty (includes user-damaged); \$10 fee thereafter; free backup w/ package. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |

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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Then light up your lives with *Light-waves*,[™] the program that encourages problem-

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EDUCATION/FUN LEARNING

| Title Manufacturer Price | Brief description | Hardware requirements | Backup policy | Ratings | | | | | |
|---|--|--|---|-------------|-------------|-------------|-------------|----|-------------|
| | | | | O | D | EH | GQ | EU | V |
| CAVE OF THE WORD WIZARD Timeworks 444 Lake Cook Road Deerfield, IL 60015 (800) 323-9755 \$34.95 ©1984 | A sure-fire way to get anyone from age 6 to adult to practice and learn 500 frequently misspelled words at 10 different difficulty levels. Game makes good use of C 64's voice synthesis.† —BUMGARNER | C 64 (d.). Joystick. | Unlimited warranty. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | ★ ★ ★ |
| CHALLENGE MATH Sunburst Communications 39 Washington Ave. Pleasantville, NY 10570 (800) 431-6616 \$39.95 ©1984 | Kids 7–12 practice addition, multiplication, subtraction, and division at a variety of skill levels in three games. Good drill but requires parental encouragement for continued use. —SUMMERS | Reviewed on C 64 (d.). Also for Apple II series, 48K (d.). | 90-day warranty (includes user-damaged); \$10 fee thereafter or for backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| DR. SEUSS' FIX UP THE MIX UP Coleco Industries, Inc. 999 Quaker Lane S. West Hartford, CT 06110 (800) 842-1225 \$34 ©1984 | Electronic jigsaw puzzle for ages 4–10 features Dr. Seuss characters. Five levels of play intended to help develop memory and pattern recognition skills. —DAVENPORT | ADAM (cart.). | 90-day warranty. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| DREAM HOUSE CBS Software One Fawcett Place Greenwich, CT 06386 (203) 622-2500 \$39.95 ©1984 | Landscape and decorate four houses. Ages 6–12 have fun visualizing different perspectives and design possibilities, and working with color schemes. —SUMMERS | Reviewed on C 64 (d.). Also for Apple II series, 48K (d.). Joystick. | 90-day warranty; \$5 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | ★ ★ ★ |
| LOGIC BUILDERS Scholastic Software 730 Broadway New York, NY 10003 (212) 505-3567 \$39.95 ©1984 | Build webs from a stable of shapes. Match webs to those created by computer or friends. Re-create ones from memory. Fun game helps develop analytical skills in adults and kids as young as 5. —FRANK | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.). | 60-day warranty; \$10 fee for 10 months thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| LUCKY'S MAGIC HAT Advanced Ideas 2550 Ninth St., Suite 104 Berkeley, CA 94710 (415) 526-9100 \$39.95 ©1984 | Parents and kids work together to create quizzes, including graphics and questions, for any subject desired. Great for practicing spelling lists. Extra subject disks available. —BUMGARNER | Apple II series, 48K (d.). | 1-year warranty (includes user-damaged); free backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | ★ ★ ★ |
| ROBOT ODYSSEY I The Learning Company 545 Middlefield Road, Suite 120 Menlo Park, CA 94025 (415) 328-5410 \$49.95 ©1984 | Design and test circuit chips and build robots to aid in your ascent out of an underground city. Sharp pre-teens and up learn about circuit design and practice problem-solving.† —MORRIS | Apple II series, 64K (d.). | 90-day warranty; \$10 fee thereafter or if user-damaged. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D | ★ ★ ★ |
| SPELL IT Davidson & Associates 6069 Groveoak Place, No. 12 Rancho Palos Verdes, CA 90274 (213) 373-0971 \$49.95 ©1984 | Kids 10 and up (younger in some cases) practice spelling in four activities and two fun games, using 1,000 different words in 50 lists, or words you enter yourself.† —BUMGARNER | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.); IBM PC/PCjr, 64K (d.). | 1-year warranty (includes user-damaged); \$10 fee thereafter or for backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| T.REX CBS Software One Fawcett Place Greenwich, CT 06836 (203) 622-2500 \$49.95 ©1984 | You are a tyrannosaurus and must survive in an authentic prehistoric habitat. Fascinating simulation encourages exploration, and teaches about dinos, ecosystems, and more.† —MORRIS | Reviewed on Apple II series, 48K (d.). Planned for C 64; IBM PC. Joystick optional. | 90-day warranty; \$5 fee thereafter if user-damaged or for backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | ★ ★ ★ |
| U.S. ADVENTURE First Star 18 East 41st St. New York, NY 10017 (212) 532-4666 \$29.95 (Atari C 64) \$34.95 ©1984 | Travel around the nation taking the shortest route between two states. Learn order in which states entered union and other historical facts. —MORRIS | Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d.); IBM PC/PCjr, 64K (d.). Joystick optional. | 90-day warranty; \$7 fee thereafter or if user-damaged. | ★ ★ | ★ ★ | ★ ★ | ★ ★ | A | ★ ★ |

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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real thing.

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and deciphering a puzzling picture. It's even programmable, so you can enter in all sorts of pairs that have special meaning to your family.

It's no mystery CBS Software offers programs to enrich the time the whole family spends together.

But instead of telling you about other programs, we'd rather keep you in suspense...

Alright, turn the page.

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GAMES REVIEWED BY JAMES DELSON

| Title Manufacturer Price | Brief description | Hardware requirements | Backup policy | Ratings | | | | | | |
|---|---|---|--|-------------|-------------|-------------|-------------|----|---|-------------|
| | | | | O | D | PS | GQ | EU | V | |
| AMAZON Trillium Software 1 Kendall Square Cambridge, MA 02139 (617) 494-1200 \$39.95 (Apple) \$32.95 (C 64) ©1984 | Tough text/graphic adventure, by novelist/filmmaker Michael Crichton. shuffles you from frying pan to fire as you try to solve a mystery set in South America. For ages 12+.† | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.). | 30-day warranty; \$5 fee thereafter or if user-damaged. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D | @ | |
| CURSE OF RA Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$20-\$30 ©1982 | Third game in Apshai series lets you continue sword and sorcery adventures in Egypt. Great play system mixes arcade playing skill with mapmaking and character growth. For ages 12+. | Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 32K (d. or cass.); C 64 (d. or cass.); IBM PC/PCjr, 64K (d.). | 30-day warranty; \$10 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | | ★ ★ ★ |
| EPIDEMIC! Strategic Simulations 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$34.95 ©1982 | You're in command of the world's scientific and military resources, trying to cure a plague afflicting the Earth from outer space. Short-playing strategy game good for ages 12+.† | Reviewed on IBM PC, 64K (d.). Also for Apple I series, 48K (d.); Atari Home Computers, 48K (d.); IBM PCjr, 64K (d.). | 30-day warranty; \$10 fee thereafter, if user-damaged or for backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D | | ★ ★ ★ |
| FIGHTER COMMAND Strategic Simulations 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$49.95 ©1983 | First-rate simulation of the Battle of Britain. 1-2 players control air forces of England and Germany during summer of 1940. Strategy game has 5 scenarios and 5 levels of play. A must for serious gamers, 12+.† | Apple II series, 48K (d.). | 30-day warranty; \$10 fee thereafter or if user-damaged. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D | | ★ ★ ★ |
| FORTUNE BUILDER Coleco Industries 999 Quaker Lane S. West Hartford, CT 06110 (800) 842-1225 \$34 ©1984 | 1-2 players buy and develop properties to build a fortune. Amusing and stimulating game, best yet for ADAM, goes beyond pure action. For ages 12+. | ADAM (data pack). Versions planned for Atari Home Computers; C 64. Game controllers. | 90-day warranty. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | | ★ ★ ★ |
| GHOSTBUSTERS Activision 2350 Bayshore Frontage Road Mountain View, CA 94043 (415) 960-0410 \$34.95 ©1984 | Challenging, amusing "gamization" of hit movie features wonderful graphics, music, and easy-to-use play system. If you "ain't 'fraid of no ghosts," this one's for you. For ages 10+.† | C 64 (d.). Joystick. | 1-year warranty. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | | ★ ★ ★ |
| MONTY PLAYS SCRABBLE Epyx, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$29.95-\$39.95 ©1984 | 1-4 humans and/or computer opponents play classic game featuring variety of ability levels, and extras such as "hint" facility that teaches while you play. Lacks spelling checker. For ages 8+.† | C 64 (d. or cass.). Versions for Apple II series, 48K (d.); IBM PC/PCjr, 64K (d.) available from Ritam Corp. | 30-day warranty; \$10 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | @ | |
| MYCHESS II Datamost 19821 Nordhoff St. Northridge, CA 91324 (818) 709-1202 \$34.95 ©1984 | Learn while you play this chess program with many skill levels, clever if sometimes mediocre graphics, and occasionally awkward mechanics, but superb documentation. For ages 10+.† | Reviewed on Apple II series, 48K (d.). Also for C 64 (d.). Version planned for Atari Home Computers. | Unlimited warranty; \$10 fee for backup or if user-damaged. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | | ★ ★ ★ |
| PASTFINDER Activision 2350 Bayshore Frontage Road Mountain View, CA 94043 (415) 960-0410 \$31.95 ©1984 | Steer futuristic vehicle over alien terrain, shooting/avoiding obstacles, picking up "artifacts" and delivering them to your bases in colorful skill/arcade game for ages 8+. | Atari Home Computers, 48K (cart.). Joystick. | 1-year warranty. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | | ★ ★ ★ |
| THE WYLDE Screenplay 1095 Airport Road Minden, NV 89423 (800) 334-5470 \$34.95 ©1983 | Build novice knight into great hero by combatting monsters in third of "Warriors of Ras" arcade/role-playing series. Requires careful strategy, skillful action to survive. Easy-to-learn play system, for ages 12+.† | Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d.). | 90-day warranty; \$5 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | | ★ ★ ★ |

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.

THE CBS SOFTWARE FAMILY

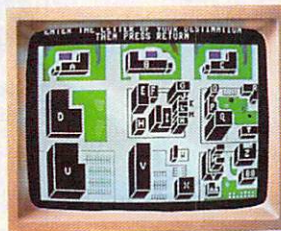
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series. There are not only murderers, but kidnappers, terrorists, burglars, blackmailers, and forgers to foil, in 12 new cases with a tough time limit to beat.

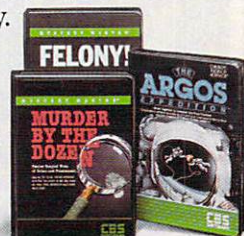
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†This isn't really a footnote. Just a reminder that MURDER BY THE DOZEN is also available for the Macintosh computer.

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 76 for information such as backup policies and addresses of software manufacturers.

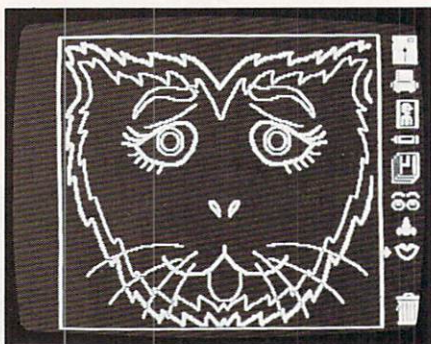
HOME BUSINESS/HOME MANAGEMENT/APPLICATIONS

Mask Parade

HARDWARE REQUIREMENTS: Reviewed on Apple II series. Also for IBM PC (w/color card)/PCjr.

MANUFACTURER: Springboard

PRICE: \$39.95



After one cold, rainy weekend, I discovered our computer table and the floor around it littered with scraps of clear Contact Paper, Magic Markers, paper faces—both incredibly funny and ugly—a pair of paper glasses with windshield wipers, and a chicken inspector badge with the name "Geek A Ramma-Lamma" on it. Still in the printer was a set of bunny ears; on the floor, a crumpled paper digital watch and a police hat. Who were the culprits behind this debris? My kids and *Mask Parade*, an imaginative utility that lets children design and print face masks, hats, jewelry, badges, shoes, and feet!

After the kids print them out, they can color them, cut them out, laminate the pieces with Contact Paper, and paste them onto cardboard. One of my children even put together a coloring book.

The program is fairly easy to operate and requires no reading. Using the joystick or keyboard, kids direct a cursor over the picture (or icon) representing what they want to do. To see the selection of faces, you place the cursor on the face icon. Add a nose, mouth, or eyes, experimenting with various possibilities.

Occasionally, we accidentally erased

a feature, but with care and practice we learned to avoid that.

There is a considerable variety of features to choose from. You can even draw your own faces from scratch, although the joystick doesn't allow for very precise control. It takes too long to flip through all the choices and we grew impatient at having to go through the whole cycle just to get back to a nose or face we liked. A reference card of faces and features, and the option of selecting a choice directly by number would help.

On balance, this program's benefits definitely outweigh this drawback. An enjoyable, useful, and unusual home application, *Mask Parade* fosters creativity and transforms your computer unexpectedly into a fanciful costume shop.

—CATHY FRANK

The Milliken Word Processor

HARDWARE REQUIREMENTS: Apple II series.

MANUFACTURER: Milliken Publishing

PRICE: \$69.95

Word-processing programs are often too complicated for young or easily intimidated users to pick up. *The Milliken Word Processor* is a remarkably palatable package that will let you or your youngster easily type spotless letters, essays, and more.

John, my 9-year-old, is using it to write his first school research paper. He thoroughly enjoys what at first seemed a dull assignment. He feels comfortable with the pictures (icons) of the desk, the file cabinets, and file drawer, and has no difficulty remembering how to use them to file, retrieve, and manipulate text. If he does run into trouble, a computerized help manual assists him.

Both the manual and the on-screen helps use simple language. In fact, John has located most of the features without asking for assistance. He can move blocks of text, delete sections, and find words all in a matter of two keystrokes. When he's ready to print, he can preview his text, change line width and page length, decide whether to double- or single-space his work, and include page numbers or not.

As a child's first word-processor, the *Milliken* package is a shining success. Though it will only let him process work of approximately six pages in length at a time, he can

print out a series of files if his report exceeds that amount. I expect this program to carry him through many papers. —MARLENE ANNE BUMGARDNER

EDUCATION/FUN LEARNING

Cave of the Word Wizard

HARDWARE REQUIREMENTS: Commodore 64. Joystick.

MANUFACTURER: Timeworks

PRICE: \$34.95

We've seen our share of arcade-type games that try to drill spelling, or spelling drills that try to entertain. It's only with some arm-twisting that our kids spend any time on them. With *Cave of the Word Wizard*, our kids need no convincing. It's actually taken off the shelves almost as often as some of the other "real" games.

It's a spelling program in which you have to search for four crystals hidden throughout an eight-level cave. A puddle, pits, ladders, creeks, and cave creatures alternately trip you up or help you out. You've got a flashlight to help you see, but its battery power is limited.



The learning happens when the word wizard appears from time to time and, in a gravelly, but surprisingly clear-quality synthesized voice, utters a word, which you must spell correctly. If you can't understand the word (some of the words at the higher levels, "isthmus" and "pterodactyl," for instance, are true tongue-twisters), you can ask the wizard to repeat himself. A correct spelling recharges the flashlight; a misspelling uses up more juice. The game ends when you successfully locate the four crystals, or your flashlight burns out.

By exploring through *Cave*, at one of four different skill levels, our kids practiced and learned to spell some 50 words in each of 10 lists. They

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Spell.

Spell It!

Spell expertly 1000 of the most misspelled words. Learn the spelling rules. Improve with 4 exciting activities, including a captivating arcade game! Add your own spelling words.

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ages 8 — adult / 2 disks: \$49.95



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| | | |
|------------------------------|------|------|
| Archon | \$40 | \$28 |
| Archon II (no IBM) | \$40 | \$28 |
| Battle for Normandy | \$40 | \$27 |
| B C's Quest for Tires | \$35 | \$21 |
| Bruce Lee (no IBM) | \$35 | \$22 |
| Castle Wolfenstein | \$30 | \$19 |
| Deadline | \$50 | \$32 |
| Enchanter | \$40 | \$27 |
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also got a chance to work out strategies, assisted by the map furnished in the documentation and the on-screen radar display. The only other option I would have liked to see would have enabled us to add our own spelling lists, to use when my family masters the ones provided.

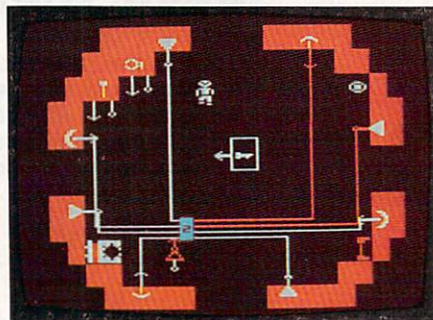
—MARLENE ANNE BUMGARDNER

Robot Odyssey I

HARDWARE REQUIREMENTS: Apple II series.

MANUFACTURER: Learning Company

PRICE: \$49.95



You're deep underground in a city of robots five levels below the real world. Assisted by a set of special robots, you must find your way up through each level of Robotropolis. The challenges increase with each level and your robots' skills must, as well. Be prepared to spend much time in the Innovation Lab—designing and testing new robot circuits.

Robot Odyssey I, like The Learning Company's outstanding and popular *Rocky's Boots*, teaches you to design circuits to achieve different effects. You'll have to connect gadgets like "thrusters," "grabbers," and "bumpers," using "AND-gates," "NOT-gates," and other devices.

Using a carefully constructed combination of elements, you customize your robots to move in response to their environment and to help you back to mankind. By designing and building microchips that contain miniaturized circuits or other chips, and inserting these into the robot's architecture, you can make a machine that's incredibly complex.

Our kids love *Robot Odyssey* (although they still haven't made it through all of Robotropolis' five levels). They liked the graphics, and found the documentation to be thorough, appreciating especially the quick reference section. It was tough and challenging for them—"Just like a good adventure game should be"—

my teenagers reported.

Signs of care and quality are everywhere. The ESC key takes you back to the main menu. Pressing "?" provides hints. You can write, and then SAVE to disk, your own documentation for the special chips you build using a built-in word-processor. Also, store your chips, robots, and progress in the game on a blank disk. All this power, of course, requires a lot of disk space, two sides in fact. And the repeated disk-flipping gets tiresome.

One note of caution: *Robot Odyssey* takes a long time to learn and play. Younger users (below the teen level) or kids uninterested in electronics or robots may get discouraged. And the graphics play confusing tricks from time to time (a directional sensor's arrow placed at the bottom of the screen will wrap around and appear at the top).

But for these small problems, the program is a unique introduction to circuitry and electronics—a fabulous problem-solving experience that genuinely stimulates an otherwise jaded early-teen audience. —TONY MORRIS

Spell It

HARDWARE REQUIREMENTS: Reviewed on Apple II series. Also for Commodore 64, IBM PC/PCjr.

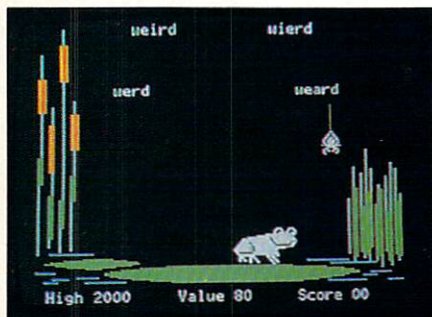
MANUFACTURER: Davidson & Associates

PRICE: \$49.95

As parents, we're constantly searching for ways to help our kids improve their performance in and out of school. My kids find the computer a comparatively easy pill to swallow as a tool for helping them with spelling words and lists. They can jump right in with *Spell It* and play a game, or take on the activities that use one of the 50 lists provided with the package.

In one activity you put each of the 20 words per list into context in a sentence. Another asks you to unscramble each word. The most lively activity uses a frog that hops out of a bog to select a word spelled correctly from amidst three other misspelled versions (known as distractors). Like words are often organized together in lists, with a corresponding rule, for example: "WHEN A WORD ENDS IN SILENT E, DROP THE E BEFORE ADDING A SUFFIX."

The data disk contains 1,000 commonly misspelled words. When your spellers have worked their way through these, they can move on to



words or lists you enter yourself—along with sentences, distractors, and scrambled versions. You can review misspelled words on-screen after each activity. In addition, you can print out spelling lists for study away from the computer.

Spell It is not a game. To use it, kids may require some encouragement. Nevertheless, it's a tight package, and one that may lead to improved spelling abilities.

—MARLENE ANNE BUMGARNER

T.rex

HARDWARE REQUIREMENTS: Reviewed on Apple II series. Versions planned for Commodore 64, IBM PC/PCjr. Joy-stick optional.

MANUFACTURER: CBS

PRICE: \$49.95

T.rex lets you experience, firsthand, what tyrannosaurus dinosaurs had to face in order to survive more than 65 million years ago. In the game's early stages, you explore several different environments in search of smaller dinosaurs to eat. If you go too long without food, or are severely injured in a fight, you'll die. If you conserve energy, eat frequently, and avoid confrontations with the deadly triceratops, you may survive long enough to proceed to the game's advanced levels.

There you'll explore several new environments that require you to pay attention to body temperature, water reserves, and food stores. The pace becomes quicker, and quicksand and tar pit obstacles appear unexpectedly. But the longer *T.rex* survives, the more experience points it accumulates, and the stronger and faster it becomes.

The package's documentation is extraordinary—easy to read and thorough—and includes additional sources of dino information at different reading levels. An entire disk is devoted to demonstrating and explaining the main features of the game. And at any point in the early



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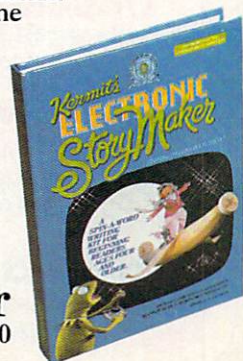
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stages, you can call upon a small library of helpful information stored on the game disk.

A "simulation" of a prehistoric habitat (see *Home-School Connection* in this issue), *T.rex* lets you vary some of the parameters of the game and observe the effect on the tyrannosaurus' ability to survive. You can increase or decrease *T. rex*'s speed, heat up (or cool down) his environment, make *T. rex* more (or less) healthy to begin with, and even alter the amount of available food and water. Thus, if you've mastered the basic game, you can experiment endlessly with other possibilities. The result, as one of my kids pointed out, is that "you don't even know you're learning history and basic survival skills while you're playing."

Graphics and sound are first rate. You can display the dino's status at any moment and save the game for later play. Our family agreed it would probably be frustrating for kids at the younger end of the 8-to-adult recommended age range. There's so much to learn, and surviv-



al is difficult in even the simplest level. Also, we sometimes found the dino hard to distinguish from the background (perhaps this simulates camouflage, but it's irritating). Still, this is a terrific educational simulation game—an example of how the computer can serve as a telescope into fascinating and remote worlds.

—TONY MORRIS

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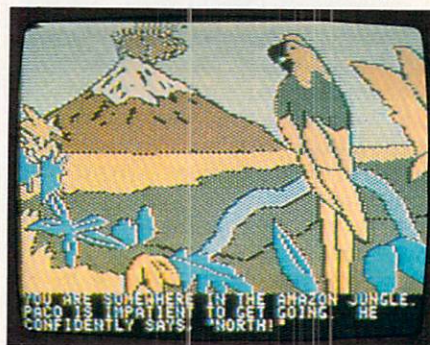
HARDWARE REQUIREMENTS: Reviewed on Apple II series. Also for Commodore 64.

MANUFACTURER: Trillium Software
PRICE: \$39.95 (Apple); \$32.95 (C 64)

Michael Crichton, the multitasking doctor/screenwriter/novelist/film director, has turned his attention to

a new field: computer gaming. His first creation, *Amazon*, is a difficult but clever text/graphic adventure in which you're placed in the role of an Indiana Jones-esque fellow who attempts to solve a mystery set in South America.

The game has limited graphics, but what's there is choice. The pic-



tures include several first-rate animated graphics sequences (meant to balance out the text-only material, I suppose). They're the sort of thing I expect to see more of as the years roll along. For the most part, you're going to be playing a text-only game, interrupted by an occasional flash of outstanding color, including some sharp visual tricks (wait until you try on the night goggles).

The bulk of the game takes place in a remote and dangerous South American jungle which you must successfully negotiate to even have a chance at playing out the final moves of the mystery. Though you have help from Paco the Parrot; a two-way, long-distance satellite transceiver; a laser gun; and several other neat devices, most of the time you have to rely on your wits to get out of trouble or go on to the next stage of your journey. Saving your character regularly is advisable.

Playtesters had a hard time with this game, though I've spoken with a K-POWER expert who has completed it. The problem is (as always) that you must be phenomenally specific in your "conversation" with the computer. If you aren't, you're going to be stuck or dead. Patience is more than a virtue in this game, it's a necessity. Good for ages 12 and up.

Epidemic!

HARDWARE REQUIREMENTS: Reviewed on IBM PC. Also for Apple II series, Atari Home Computers, IBM PCjr.
MANUFACTURER: Strategic Simulations
PRICE: \$34.95

It's rare to find a strategy game that is easy to play, takes only a short time to finish, and is good enough to demand instant re-starting after a run-through. But *Epidemic!*, from Strategic Simulations, is just that. You (and as many advisers as you can muster) are the just-appointed international task force assembled to halt, analyze, and hopefully cure a space-borne plague roaring across Earth.

Armed with a variety of weapons, you can temporarily arrest it, sometimes slow it, and, under extreme conditions, resort to a nuclear option and destroy entire subcontinents to stop the disease from eradicating the human race.



This is a pure strategy game, playable on four different skill levels. Although we preferred to play it with a group of people, it's designed for solitary gaming and is an excellent way of passing an hour or two. At each turn (a day in computer time) you can take only a limited number of steps towards eliminating the epidemic. Should you shoot down a plague-bearing meteor which your radar says is hurtling towards an unaffected region? Try to cure a barely-hit area? Obliterate a nearly-destroyed zone? Or perform any of the other operations which will mean life or death to tens of millions of people?

It's actually just like a Grade B science-fiction movie (you know, one of those with actors who speak English without moving their mouths). It's also one heck of a game, suitable for ages 12 and over, a real brain-teaser that playtesters went wild over. (For an added twist, assign each player several countries/areas as his or her "responsibility." They're the only ones who can push the button to kill their own people. This makes the nuclear option all the more realistic and less likely to be used.)

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WHAT'S IN STORE SOFTWARE REVIEWS

Fighter Command

HARDWARE REQUIREMENTS: Apple II series.

MANUFACTURER: Strategic Simulations
PRICE: \$49.95

The Battle of Britain was one of the hardest-fought air campaigns in history. Having defeated most of the Allied armies in land combat, and with most of Western Europe in his grasp, Adolf Hitler only needed to conquer England before his domination would be complete. In preparation for a planned (though never realized) invasion of England, Hitler sent his powerful air force, the Luftwaffe, to crush the weakened Royal Air Force.

With an air fleet only a third the size of the Luftwaffe, the R.A.F. managed, through the use of its radar network and superior fighter planes, to defeat the Germans in a



five-week long campaign. At the end of that time Hitler gave up his invasion plans and Britain began the long struggle back to victory.

Fighter Command is an excellent simulation of the entire Battle of Britain campaign. The package also contains four shorter scenarios if the full game proves too daunting a prospect. Players have the option of multiplayer or solitaire games, at a variety of skill levels.

This advanced-level game offers one of the most exciting simulations of air combat I've experienced. Players dispatch their squadrons of planes, then watch as they move off of airfields to engage enemy units in combat. Reports come in about battle casualties. And when the raids head back across the English Channel or the North Sea, there is a long, grueling wait for the squadrons to return to their bases for repairs and refueling before they go up again and defend their island.

Playing this game is like watching one of those old World War II movies

where R.A.F. personnel crowded around a giant mapboard of England, moving wooden blocks representing different squadrons. You can stay on top of everything with the enclosed map and cardboard counters.

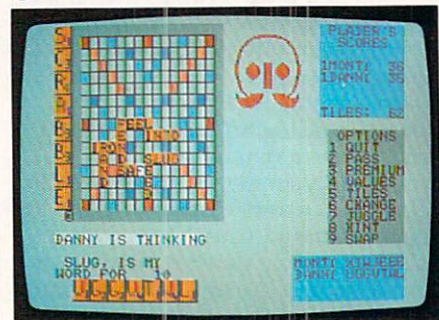
Not likely to grow dull over time, this game requires a minimum of 12 hours for a one-day scenario and a month for the full game. For players 12 and up.

Monty Plays Scrabble

HARDWARE REQUIREMENTS: Commodore 64. Also Apple II series; IBM PC/PCjr.
MANUFACTURER: Epyx
PRICE: \$29.95-\$39.95

Good news, Scrabble fans! Epyx has released a computerized version of the game and it's terrific, allowing you to play solo when you can't tempt others into a match.

Take on computer opponents of varying abilities (from beginner to experienced). Watch the computer player(s) "think" as each potential word is weighed and briefly displayed on the screen. Opt to play with open or secret racks. You can even get a hint from the machine if you're stuck. This is a solid program.



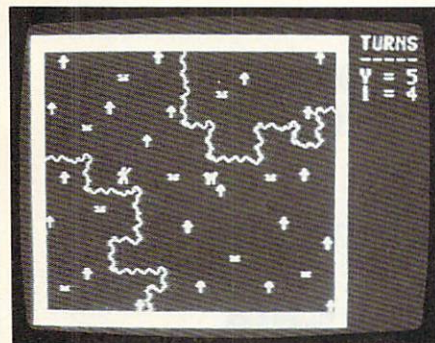
It's an excellent teaching tool for children, as well. They'll learn spelling, clear thinking, organization, and even strategy as they play. And at the game's lowest action level, they'll have a chance to beat the computer, which will certainly bring them back for more.

Monty's one serious problem, however, is its lack of a spelling checker. Unscrupulous players, or lousy spellers, could enter "XYTQHML" as a legitimate word. To handle disputed entries, appoint someone (or everyone) word marshal. It's a pity because a potential benefit of using a computer for a game like Scrabble is eliminating the hassle of looking up words.

Despite this omission, this is a game that belongs in every family library. It will provide endless hours of fun for ages 12 and up, younger, with supervision.

The Wylde

HARDWARE REQUIREMENTS: Reviewed on Apple II series. Also for Atari Home Computers, Commodore 64. **MANUFACTURER:** Screenplay **PRICE:** \$34.95



Good news for role-playing adventure fans: Screenplay's *The Wylde* is a fitting and exciting sequel to *Dunzhin* and *Kaiv*, two of the better examples of this genre. New players create a character to take on adventures, while those who have gone through one or both of the previous games may transfer their characters into the current program.

This questing game encourages new players in the beginning with easier monsters to fight. Using a variety of weapons, armor, and magic items, you trek across a mythic land in search of booty and glory. Once you've had the opportunity to develop into a better warrior, villains grow fiercer.

Battles are at the core of adventure gaming. *The Wylde*, like the entire *Warriors of Ras* series, has a particularly well-designed combat system. You have to act carefully and use strategy if you are to survive.

Movements are made and actions taken using a point system which penalizes you for wearing heavy armor or carrying too much treasure. Faster creatures will assault you at an accelerated pace if you're heavily encumbered.

A fourth game, *Ziggurat*, is coming soon, and I look forward to continuing my adventures in Screenplay-land. In the meantime, I recommend *The Wylde* for solo players ages 12 and up.

—REVIEWS BY JAMES DELSON

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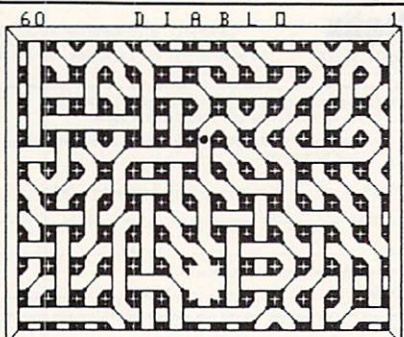
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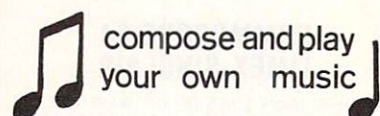
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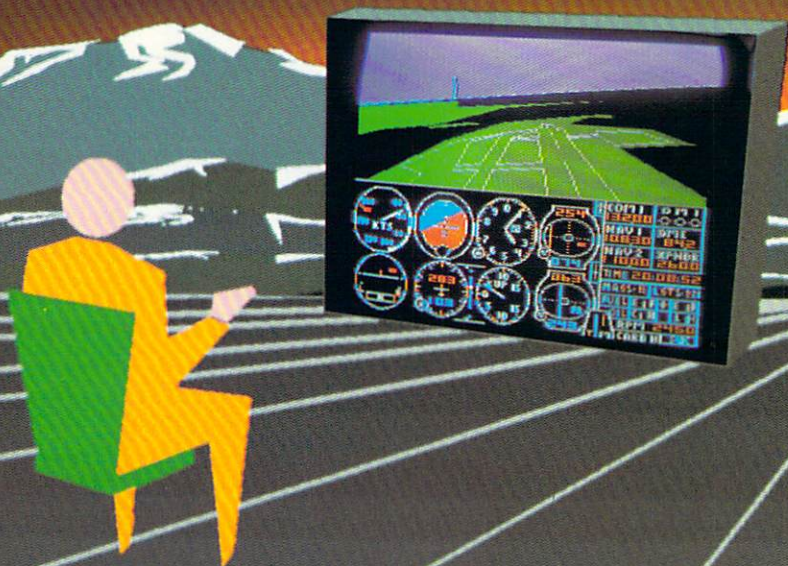
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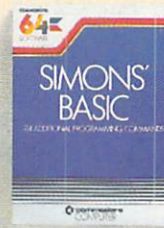
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