

PREVIEW: THE NEW
COMMODORE PLUS/4

FAMILY COMPUTING™



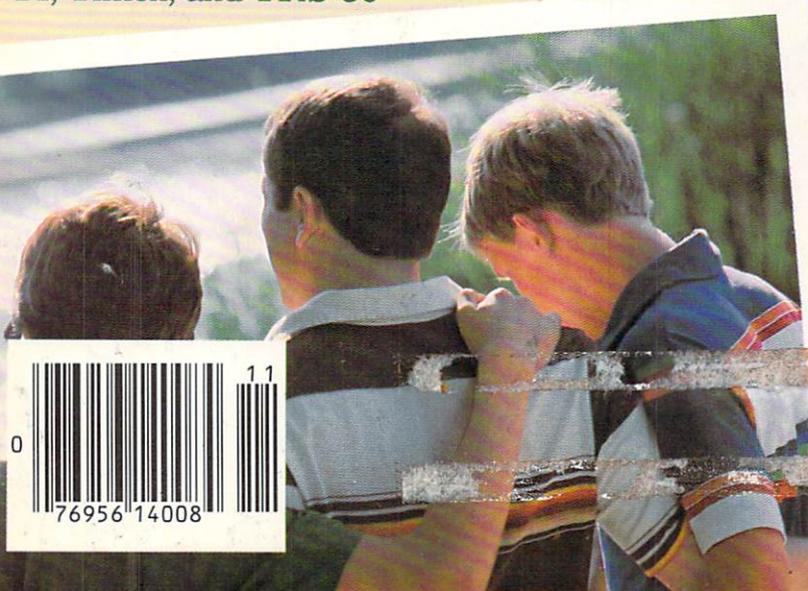
Life with *Bachelor* Father and His Computer: Saving Time and Money

Software to Challenge Your Children

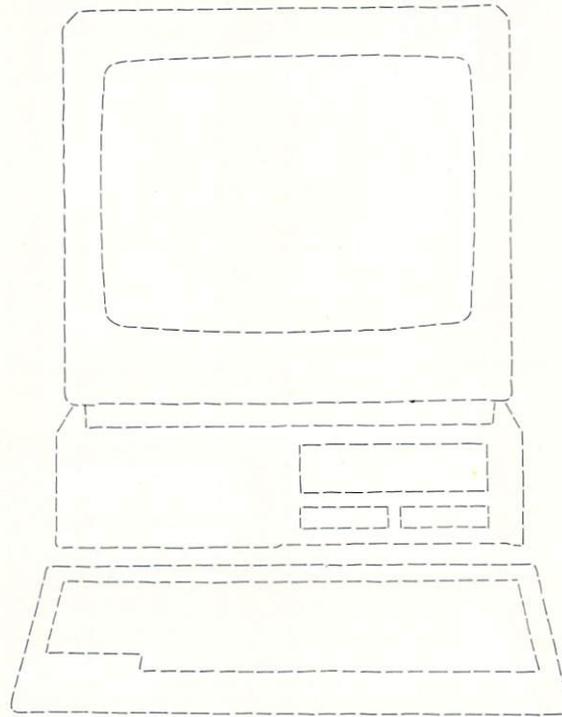
How to Manage Your Money: Q&A with Andrew Tobias

Buyer's Guide to Monitors

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



Picture a computer under \$1000
that runs over 1000 of the best programs
written for the IBM PC.



Now picture this.

There's a lot that's new about PCjr and it's all good news for you.

PCjr now has a lower price. A new typewriter-style keyboard.

A new option that can give user memory a dramatic boost.

And new business and personal programs to add to its fast-growing library of up-to-date programs.

All of which can make PCjr the most useful computer a little money can buy.

It comes standard with 128KB of user memory — twice the memory of its most popular competitor. An advanced 16-bit processor. And a double-sided diskette drive that can store over twice as much information as most single-sided drives.

With all these features, PCjr can run over a thousand of the most popular programs written for the IBM PC. And with the new optional 128KB Memory Expansion Attachment,

it can run over a thousand more.

PCjr also runs a growing number of powerful cartridge programs. They work faster than



diskettes, and don't take up a bit of user memory. The three newest examples being Lotus 1-2-3,™ the fascinating PCjr ColorPaint and Managing Your Money™ by financial expert Andrew Tobias.

As its library of software keeps growing, PCjr keeps growing, too. By leaps and bounds. Because IBM designed it with 13 ports for add-on options. And a modular construction that will accept new capabilities down the road. Even those that haven't been invented yet.

All this in a computer that weighs a mere 10 pounds.*

Takes up just a bit over a square foot of desk space. And costs less than \$1,000†.

without monitor. Picture yourself with a PCjr. Try one out and see what's new at an authorized IBM PCjr

dealer or IBM Product Center.

For the name of the store nearest you, call 1-800-IBM-PCJR. In Alaska and Hawaii, call 1-800-447-0890.



The new PCjr Memory Expansion Attachment can give memory a quick lift to 256KB. Or, along with a PCjr Power Expansion Attachment, all the way to a hefty 512KB.

More computer for your money.

See how PCjr compares with other computers at its price.

Memory	Software
User Memory (RAM): 128KB (expandable to 512KB)	Runs over 1,000 programs written for the IBM PC
Permanent Memory (ROM): 64KB	Runs both diskette and cartridge programs
Diskette Drive	Display
Double-sided, double density	40- and 80-column
Capacity: 360KB	Resolution:
	4-color: 640h x 200v
	16-color: 320h x 200v
Processor	Expandability
16-bit 8088	Open architecture
Keyboard	Optional 128KB
Typewriter-style	Memory Expansion Attachment(s)
Detached; cordless	13 ports for add-ons, including built-in serial interface
Warranty	
1-year limited warranty	



Right now, PCjr can run the powerful Lotus 1-2-3™ on diskette (with Lotus 1-2-3 PCjr Installation Kit and additional memory). The new cartridge version, requiring no additional memory, will be available this fall.



Managing Your Money™ by Andrew Tobias, new on cartridge for PCjr, is a comprehensive personal financial advisor and manager.



Turn your screen into a canvas. The new cartridge program, PCjr ColorPaint, lets you create with the added dimension of color.



PCjr's new typewriter-style keyboard adds a nice touch to business, home or educational computing.

IBM PCjr

Growing by leaps and bounds.

Managing Your Money is a trademark of MECA. 1-2-3 and Lotus are trademarks of Lotus Development Corporation.

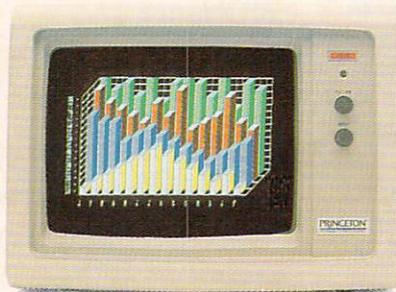
*Weight does not include power pack and monitor. †IBM Product Center price.

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If you're looking for a quality monitor, look for this symbol.

HX-12. A high resolution monitor at a medium resolution price.

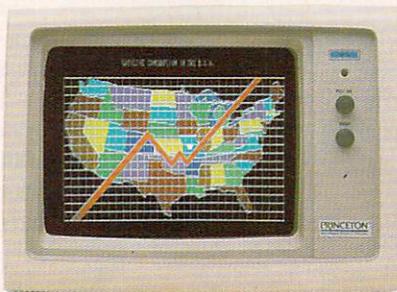


HX-12 is a high resolution RGB color monitor that's colorful enough for all your graphics needs and sharp enough for word processing.

With its own cable that plugs directly into the IBM PC, the HX-12 delivers a rainbow of 16 colors on a non-glare screen. All that includes clean whites without red bleed. In fact, all the colors are clean and crisp thanks to the HX-12's .31mm dot pitch and 690 x 240 (non-interlaced) resolution.

Shop around. Nothing else compares to the HX-12 priced at just \$695.

The SR-12 delivers even better resolution color for a better-than-ever price.



At first glance, the SR-12 might appear similar to the HX-12 with a non-glare screen and .31mm dot pitch supporting 690 horizontal resolution. But take a closer look. SR-12's scan frequency is 31.5 KHz, allowing the SR-12 to support 480 vertical resolution in non-interlaced mode. That means a high-quality, flickerless image with text that's up to monochrome standards. What's more, you get all that quality for \$799.

For full compatibility with all IBM software, get the **Princeton Scan Doubler**. Priced at \$249, it allows you to run the SR-12 from a standard IBM or IBM equivalent color card in the IBM PC.

You can't beat the SR-12 for resolution or price.

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PGS combines easy-on-the-eyes amber phosphor and exceptional 800 x 350 resolution to give you the MAX-12, the best monochrome monitor for your money.

Check the non-glare screen. Dynamic focusing circuitry keeps the image sharp, not only in the center, but around the edges and in the corners. Then check the price. At \$249 the MAX-12 is less expensive than the leading green-on-black competitor. And there's more. The MAX-12 works with the IBM PC and other IBM compatibles.

For clarity, performance and price, your choice is clear. Make it the new MAX-12.

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FAMILY COMPUTING

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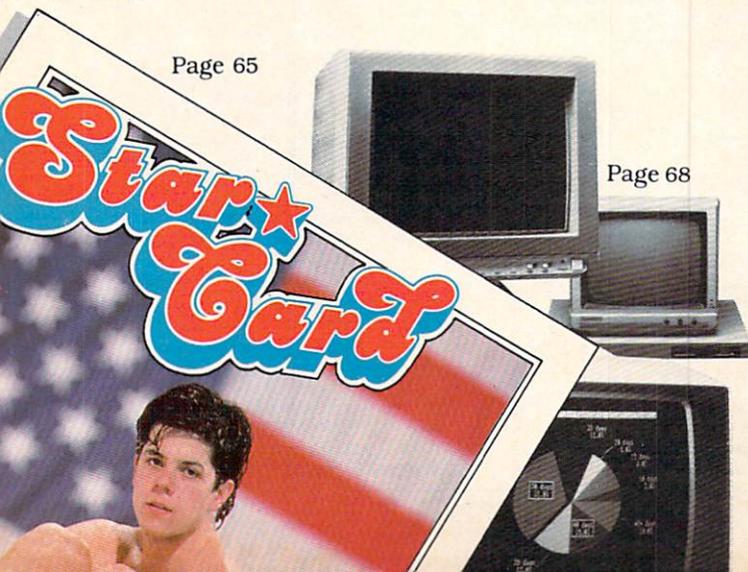
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EDITOR'S NOTE

FAMILY CONNECTIONS

A few months ago we got a letter (you'll find it on page 51) that has had an important effect on FAMILY COMPUTING. First, it led us to Jon "Pat" Harper, who's featured on this month's cover. The story of Pat and his two adopted sons (see "Life with Bachelor Father and His Computer," page 51) is one of my all-time favorites. Pat uses his computer in every aspect of life as a tool that gives him more time to spend with his boys.

Pat's story signalled us once again that a new generation of computer users is out there, not lone hackers but whole families who are putting computers to work for them. With their friends and families, they are the ones who best tell their stories. These are actual people writing about their own decisions and experiences, their own mistakes, and their personal victories. It's easy to tell that every word on the page is real.

We've decided to look for other stories like Pat's, so we are using the publication of his story to announce our contest to find the "Computing Family of the Year." You can read all about it on page 71.

Connecting with Pat Harper and his family and launching our contest are only two of the family connections FAMILY COMPUTING has made this fall. You may have noticed some of the ways in which the FAMILY COMPUTING name has been spreading beyond the pages of our magazine. As a result, millions of people are getting a chance to experience our approach to using a computer at home. We hope you're able to take a look at some of our new ventures.

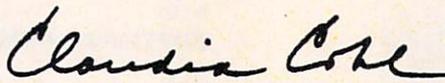
If you're among the nearly 20 million families who have access to the Lifetime Cable Network, be sure to tune in every week to the FAMILY COMPUTING TV series. In case you haven't

seen it, the show's half hour is packed with information and entertainment—a fresh, fun way to gain computer know-how. Each program includes three major segments: a cover story that chronicles an especially noteworthy use of computers; a studio story—often an interview; and a "workshop" that presents very basic information about a specific computer-related subject, ranging from shopping to software to telecomputing. There's a lot to see between these major features, making for a unique show—one you'll want to tell your noncomputing friends to catch, too.

Millions of newspaper readers are now enjoying the weekly FAMILY COMPUTING column created by us and distributed by *The New York Times* Syndication Sales Corp. You'll see a lot of the topics covered in FAMILY COMPUTING the magazine, but you'll also find up-to-the-minute reviews of brand new products and an editor's "pick of the week" at the close of each column—our recommendations for both software and hardware.

For computer users with a modem, there's the FAMILY COMPUTING electronic edition on CompuServe, a truly interactive magazine. Among the regular features offered is the opportunity to talk on line with FAMILY COMPUTING editors, to get instant reviews of new products, and to take part in stimulating electronic conferences.

Above all, of course, we hope that the original FAMILY COMPUTING—the magazine—is making a good connection with you and your family.



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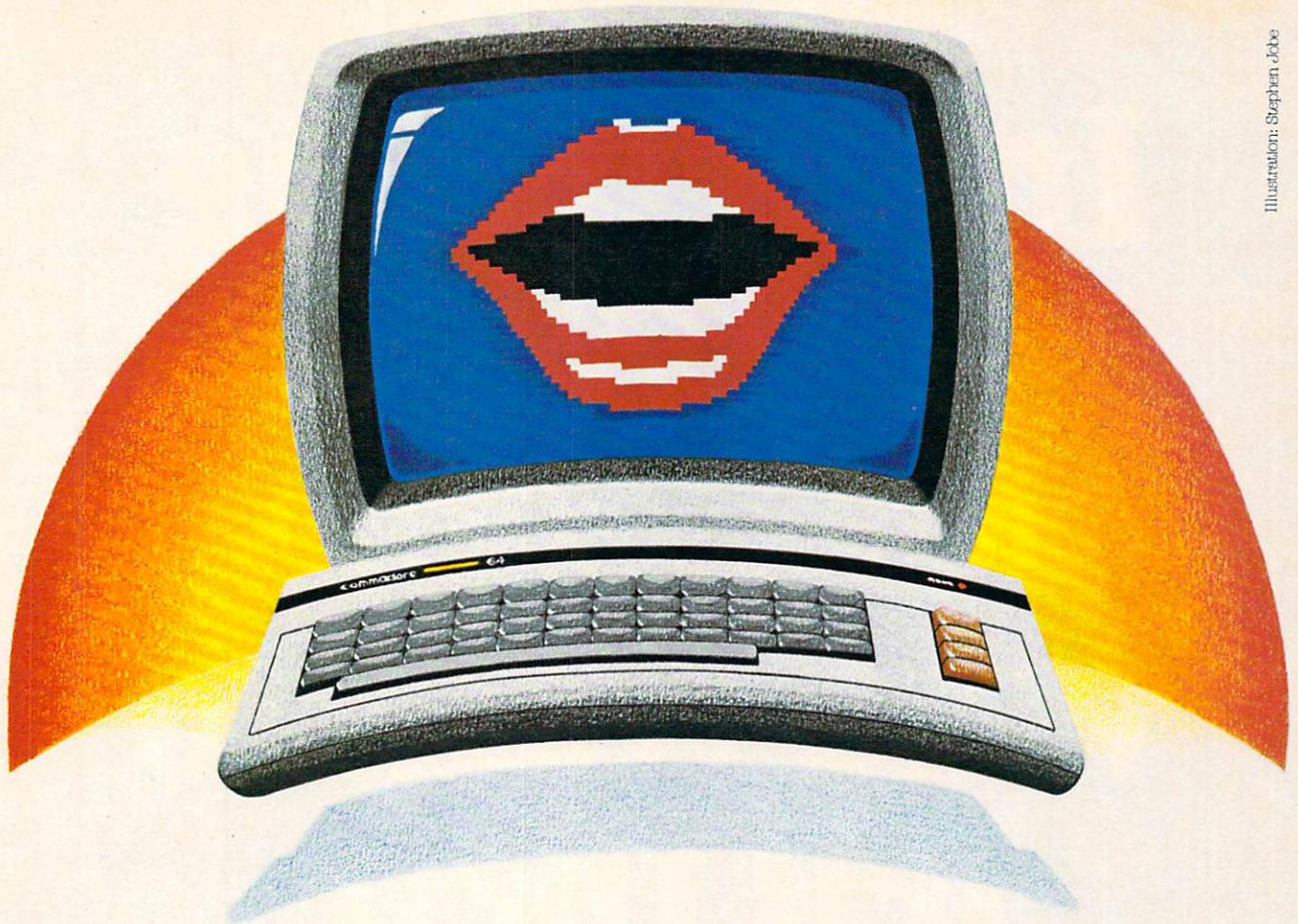
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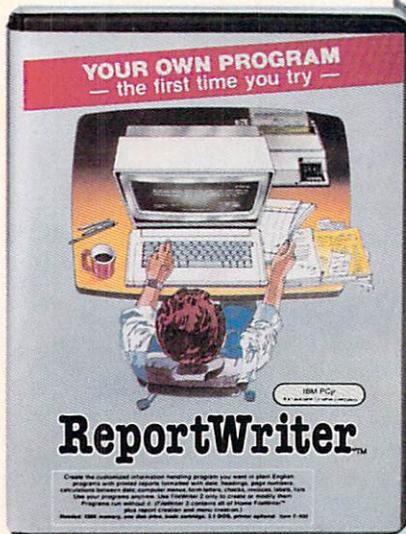
Of course you know what you want your computer to do. Trouble is, up 'til now, you had to settle for packaged software off the shelf, which meant squeezing your ideas into somebody else's design. Now your own program ideas can be captured on disk for you to use yourself, copy, or even sell!

Finally there's CodeWriter.[™] Software to help you make money.

CodeWriter software lets you create custom software to handle your information, your way. The first time. And you don't have to know a thing about programming. You type in your information in plain English. CodeWriter does the rest. It translates what you've written into program code, then saves it on a separate disk. **What you wind up with are your own programs.** Ready to run. As many as you can dream up. At a fraction of the cost.

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Whether you need software to handle personal files, create reports, figure your taxes, practice your French or design your own adventure game, there's a CodeWriter program to help you.



CodeWriter Programs are available for: Atari,[®] Commodore 64,[®] IBM[®] PC, PCjr, PC XT and compatibles, Kay Pro,[®] Apple,[®] and TI[®] Professional.

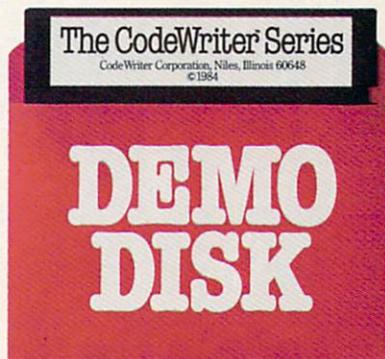
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LETTERS

GEARING GIRLS UP FOR COMPUTERS

Thank you very much for the much-needed focus on girls and computing (August issue)! It's true that many of the software packages initially released were *not* appealing to girls, and it is exciting to see the changes.

It is equally important for women to take an interest in the computer in their home or office. Let's hear more about what is being done.

I teach small classes in people's living rooms, geared toward the woman who has *not* had any computer experience, but who wants to learn computer concepts in a comfortable (nonintimidating) atmosphere. Many of them have felt left out of an important area of their children's education—they feel like they couldn't relate to it. If we want girls to be actively involved with computers, it's important that their mothers set that example.

Thank you again for an outstanding article—one I will recommend to my clients.

DIANE BASSETT
Computer Coffees
Millbrae, California

TESTING OUT TELECOMPUTING

Since I own a modem, I was very pleased to see the Telecomputing article in the August issue. I was even happier when I noticed three bulletin board numbers listed.

The major problem is with the number suggested as a good one to start with: The People's Message System, Santee, California (619) 561-7277. I logged on to the BBS more than 11 times last night, and each time attempted to reconfigure so the information I received was not garbage. I gave up. Why didn't you provide any information concerning any service configurations? What needs to be done to log on to The People's Message System properly?

I am sure a lot of your readers will waste a lot of money and time trying this number, and then retrying after they get nonsense on the screen. In the future, you will need to provide more information than just a telephone number.

MICHAEL RICHARDS
Columbia, Missouri

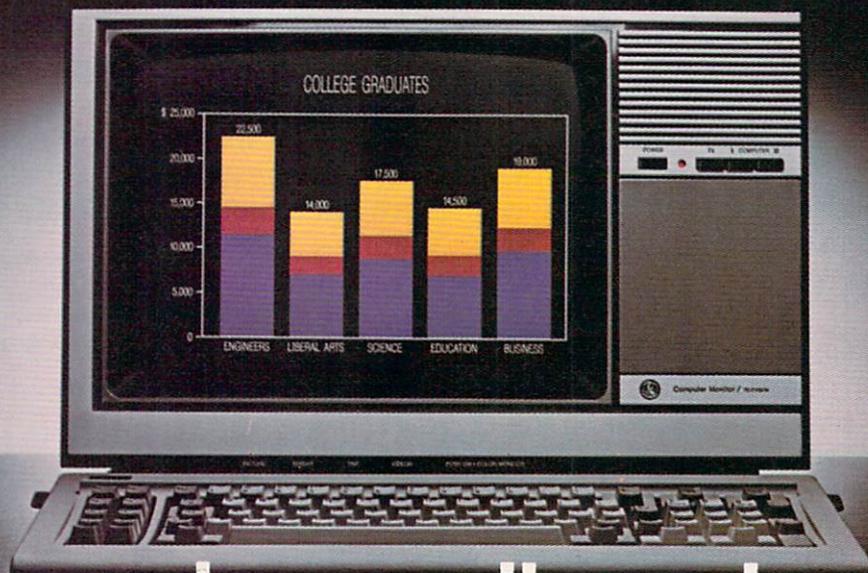
EDITOR'S NOTE: *We logged on to The People's Message System from our offices without any problem. There may have been a couple of reasons for your difficulties: a noisy phone line or perhaps the BBS was down for the night. We didn't provide service configurations since most are standard (8 bits, no parity, one stop bit). We suggest if you have problems communicating in the future, try again at a later date—chances are the problems will have gone away.*

HIGHLIGHTING THE HOLIDAYS WITH GRAPHICS

We have been enjoying your magazine from the first of 1984, even before the purchase of our Apple IIe in March. I especially appreciate the What's in Store section.

We are thinking ahead to our first Christmas letter using our Apple. We would like to use some graphics in connection with the usual written text. How about an article showing how to produce this or reviews of software to help accomplish the combination?

Please continue the programs, too.



The computer monitor so ingenious,

If you're torn between buying a dedicated monitor and making do with your regular TV, there's a smarter alternative. The General Electric Monitor/TV.

First and foremost, it's a computer monitor.

Compatible with all major computer brands, it combines these advanced features to sharpen text and graphics and deliver a display that's easy-on-the-eyes: Direct and split video inputs; 320-line resolution via a comb filter; plus a computer grade, .5mm-pitch Neovision™ picture system.

For the name of your nearest dealer, call The GE Answer Center™ Information Service, 1-800-626-2000.

How about adding a few more? We adapted the *Egg Hunt* to a *Birthday Hunt* for our 13-year-old, substituting gifts, cards, cake, etc. for the eggs.

BETH CLAYTON
Bondurant, Iowa

EDITOR'S NOTE: Take a look at our review of *Print Shop* in *FAMILY COMPUTING*'s September issue (page 120). And, for information on how to print out your creation, you'll want to watch for our article on graphics software to be published in the December issue. In this issue, check out the *Holiday Update* program on page 76.

SWEET SOUNDS

In fairness to the consumer, I feel that your "Buyer's Guide to Speech Synthesizers" (August issue) should have included a review of Sweet Micro Systems' *Mockingboard*.

As an owner of one of these synthesizers, I am completely satisfied with its performance. True, a phonic speech method is somewhat difficult to use, but the resulting clarity, expression, vocal deviation, and accu-

racy is well worth the extra time. Besides, it makes the vocabulary virtually endless.

TERRY L. GRAY
Parachute, Colorado

EDITOR'S NOTE: You're right. We mistakenly overlooked the *Mockingboard*. Because its reputation as a sound synthesizer is so good, we've never tried the speech function! Our apologies.

SCHOOL CONNECTION

Your magazine is the best! All my friends and I work on Commodore 64s at school, and I have an ADAM at home. *FAMILY COMPUTING* is perfect for us because all of the really great programs are written for the different computers we use. They're so easy to type in, too, because of the excellent way they have been written to save the amount of time we spend typing.

We type in all your programs and show them to our computer teacher. He just loves them and gives us extra credit points! He ordered a subscription to use as a guide to beginning computers next year.

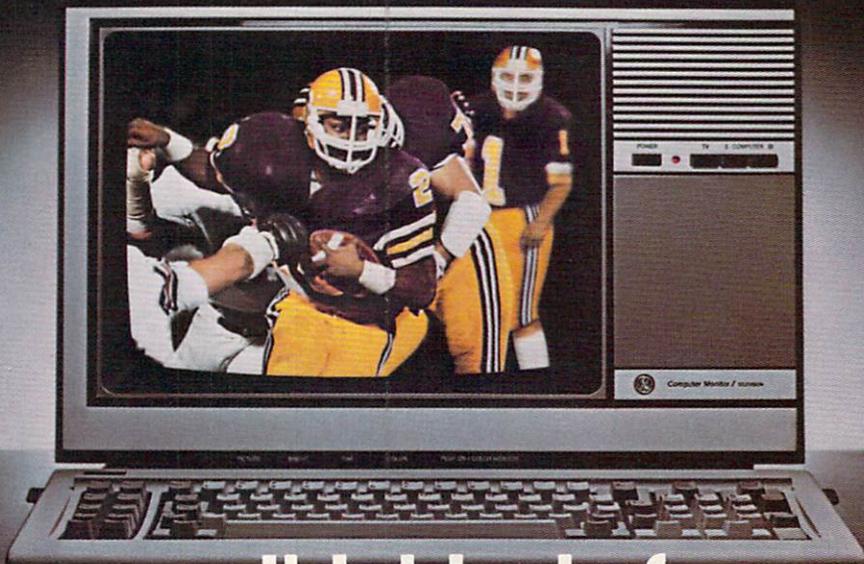
Each month we eagerly await the arrival of your magazine. The programming section is the first thing we turn to, and we devour the products section. It always has lots of awesome programs reviewed, and we save our money to buy the ones you review as the very best.

Your magazine is on the top of the heap right now. Keep it up!

CHRIS ALDRICH, age 12
BRIAN COWELL, age 12
BOBBY ANDERSON, age 10
KEVIN MOE, age 14
Duluth, Minnesota

I very much enjoyed the Editor's Note in the September issue of *FAMILY COMPUTING* because, as a teacher, September has always meant a new beginning for me, too. Since last September, I have become deeply involved in the computer program at my school. Last spring, I even taught an after-school enrichment program in computers. *FAMILY COMPUTING* was an invaluable source of material for that program.

JOANNE M. CALNAN
Watertown, Massachusetts



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Secondly, it's a first class TV.

Flick a switch and these same advanced electronics give you an outstanding TV, with a high-contrast picture and rich, true colors.

And you get all this for about the same price as an ordinary monitor. Another piece of ingenuity we thought you'd appreciate.

We bring good things to life.



BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

EDITED BY BILL CAMARDA

Electronic Election '84

Move over, Dan Rather. This election night, computer owners can follow the results—and even discuss them on-line—by hooking into the interactive election coverage planned by electronic data bases such as CompuServe and The Source.

CompuServe will offer Associated Press reports, plus ongoing discussion generated by Republican and Democratic SIGs (Special Interest Groups).

Ingrid Nolley, systems operator for the Republican SIG, says many of her 430 members will spend election night conferencing and watching the results on-line.

Subscribers to The Source can access edited wire-service reports, or experience "interactive electronic journalism," thanks to the Trans-coastal Electronic News Service (TENS).

"This is the only medium where people can talk back to the reporter, ask questions, give suggestions, and discuss reports among themselves," says Sherwin Levinson, TENS co-founder. He says TENS may even offer exclusive exit-poll data in The Source's PARTICIPATE teleconferencing mode.

Both services say they may plan for even more election-night coverage between now and Nov. 6.

—LINDA WILLIAMS

Situation Wanted

Job hunting? You can put your resume on-line where dozens of major companies can see it, and it won't cost you a cent.

Computer Assisted Recruitment International, Inc. (CARI) runs the system, which is paid for by employers who use it. For now, you have to fill out a Candidate Profile form—add a resume, if you have one—and send it to CARI to get into its data base. Soon, however, you'll be able to get on by modem.

Using CARI's computers, employers enter precise specifications for the person they're looking for. CARI responds on-line with information about job seekers that fit. According to a CARI spokesperson, this can



shorten searches from a month to 15 minutes.

CARI originally specialized in engineering and data-processing jobs, but now accepts resumes for any white-collar position. The service started out in the Midwest, but has since gone national, with more than 20,000 resumes and many large corporate customers on-line, including Bank of America. For information, write to CARI at 1501 Woodfield Road, Schaumburg, IL 60195, or call (800) 221-5635.

A New Atari?

If you can't beat 'em, sell out to them. That's what Warner Communications did when it sold Atari to Jack Tramiel, who'd made Commodore into America's No. 1 seller of computers for the home. Nobody's sure what he'll do with the company, but if his record is any clue, it'll be exciting to watch.

Atari made a good computer, but thanks to bad management decisions and a price war won by Tramiel's Commodore, it lost more than \$500 million last year. Rather than simply closing its home computer division, as Texas Instruments and Timex did, Warner sold Atari to Tramiel at a fire-sale price.

Tramiel, who left Commodore in January, quickly installed three of his sons in major positions, and fired all but 300 of Atari's 1,200 employees. (TV spokesman Alan Alda remains on board, Atari says.)

Gone is much of Atari's customer-service staff. The company says it'll still provide service through its Cali-

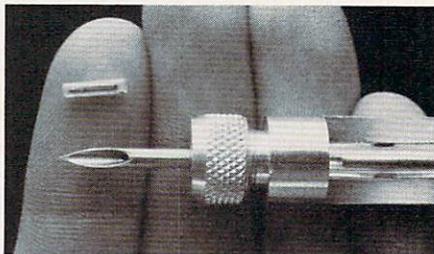
fornia headquarters, but during the transition it'll be very slow. Atari's non-toll-free service number is (408) 745-4851.

Atari will keep selling the 800XL computer and peripherals at least through the holidays, and is cutting prices. After the holidays? At press time, Atari wouldn't say.

At Commodore, Tramiel became legendary for aggressive cost-cutting. He produced powerful computers and sold millions of them at remarkably low prices. But newer Commodore models rarely ran software made for earlier computers, and users' groups complained of inadequate quality control and customer support.

Tramiel apparently intends to compete not only with Commodore, but with Apple and IBM, too. In 1985, he says, Atari will be selling video games, family computers, and even small business computers, "all at affordable, rock-bottom prices." If he can do all that, it'll be a miracle. But it won't be his first.

Fish & Chips



A PIT-TAG, along with the instrument used to implant it.

You don't want to eat *these* chips with your fish. Federal scientists in the Northwest are preparing to implant salmon with computer chips to follow their migration.

The experimental chips, called Passive Integrated Transponders, or PIT-TAGs, are no bigger than rice grains. Whenever a fish with a PIT-TAG passes by a scanner, the tag will transmit a unique signal—the fish's "name."

Fish hatcheries like the tags, because for the first time they'll be able to keep track of breeding patterns accurately. But the scientists do have a few kinks to work out. They're still wondering where to put the chip so nobody will eat it. ☐

To teach your child to spell, we had to design software that talks.

Cave of the Word Wizard.™ A unique way to develop spelling skills using human speech and arcade action.

Software that tries to teach spelling by jumbled letters isn't a very good teacher. The software has to talk. Now it does. Only on *Cave of the Word Wizard* from Timeworks.

The Wizard talks like a human being, not like a robot. This fascinating character thrusts you into an intriguing adventure as he teaches spelling in the most effective way possible on a computer.

You have wandered into a mysterious cave, and the entrance has been sealed behind you. Suddenly the Word Wizard appears and informs you that in order to leave his cave you must find four magic crystals which have the power needed to open the cave entrance. You have only a flashlight to help you find your way through the cave, and your batteries are running low.

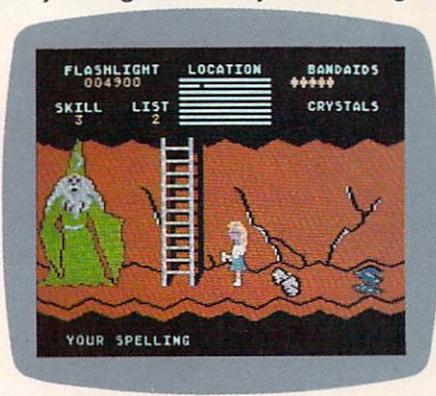
The Wizard is a funny old fellow who causes lots of mischief for anyone who enters his cave. He will appear often and ask you to spell a word—you will actually hear the old Wizard's voice!—and you cannot continue your search until you spell the word correctly.

The Wizard will use his magic powers to replenish the energy in your flashlight if you spell the

word correctly, but each time you are wrong he will draw energy from your light. When your flashlight runs out of energy you will be doomed to roam through the cave in darkness forever.

During your search you will be confronted

with spiders, rocks, snakes, and other dangerous obstacles that will make your quest for freedom even more challenging.



This state-of-the-art educational program includes 500 spoken words in 10 spelling skill levels and

makes full use of the sound capabilities of your computer. The

Wizard will talk to you in clear human speech. No additional hardware is needed for your computer system.

Only Timeworks offers *Cave of the Word Wizard*.

Now at your favorite dealer. Or contact Timeworks, Inc., 405 Lake Cook Road, Deerfield, IL 60015.

Phone: 312-948-9200.

Available for Commodore 64*



Timeworks Programs:

- Evelyn Wood Dynamic Reader
- Dungeons of Algebra
- Dragons
- Spellbound
- Computer Education Kits
- Robbers of the Lost Tomb
- Wall Street
- Star Battle
- Presidential Campaign
- Money Manager
- Electronic Checkbook
- Data Manager
- Word Writer

Take our education home. And be a



America's schools need your help!

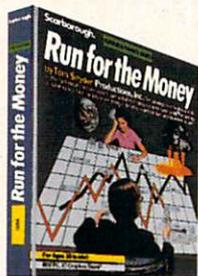
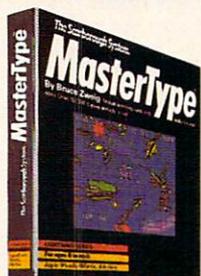
The publishers of America's number one educational program make you this unusual offer: Take any of our educational programs home and be a hero once, because kids love the fun we bring to learning. As a bonus we'll send the program of your choice to your school, free**, including a gift card in your name. You'll help meet the acute need for superior software in our schools. You'll be a hero twice!

The Scarborough System has a complete range of programs to stimulate, challenge and help you or your children be more productive—including Your Personal Net Worth, that makes handling home finances fast and easy, Make Millions, an adult business simulation game, and PictureWriter,* a program that makes drawing on the computer fun. At your dealer's now.

The Scarborough

©Scarborough Systems, Inc., 25 N. Broadway, Tarrytown, New York 10591

ional software hero twice!



MasterType™* Sharpen typing skills and increase computer facility. MasterType is the nation's best-selling educational program. It's an entertaining game that teaches typing as it increases the keyboard skills needed to be at home with a computer. And there's a bonus on top of this bonus: when we send a copy to your local school, at your request, your child will become even more proficient with a computer.

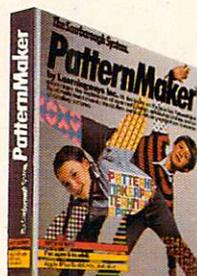
Run for the Money™ Learn to pursue profits in the real world by escaping from an alien planet. Here's an excitingly different, action-packed game of business strategy for two players. Your children will have fun as they learn a lot about business.

Phi Beta Filer™* New for children and adults. Organizes lists of addresses, dates, insurance and medical records, hobbies and collections—even school work—structures quizzes on any subject, quickly and easily. (Not available for Atari.)

Songwriter™* Kids and adults will love making music at the computer. Just press a key to listen, press a key to record, and you've started your own composition. It's a fun way to learn about music. And Songwriter can be played through your stereo or computer.



* National Education Association
Teacher Certified Software.



PatternMaker™ An amazing software program. It's geometry. It's art. It's great fun. Kids can build dazzling patterns and learn a lot. PatternMaker builds a foundation that can be applied to many professions and crafts. It challenges creativity and effectively teaches symmetry, color and design, and it's just as much fun for grown-ups, too.

Our programs are available for: IBM-PC/
PCjr, Apple II family, Commodore 64, Atari.

You'll grow with us.

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Yes! I want to software a school!

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Software will be sent only to verifiable school addresses.

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Comm. 64 Atari Apple II family IBM

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GAMES

MIXING BUSINESS WITH PLEASURE

Here's a Category of Games That Bring Home the Excitement and Intensity of High-Level Wheeling and Dealing

BY JAMES DELSON

Computers mean business! As a serious tool for organizing and number-crunching, the machine's power is indisputable. But you may not know that the same power can be harnessed to number-crunch for fun. Financial simulation games have been around for quite a while. Joining the ranks of these fancy computerized monopoly games are programs that involve, as the essential play system, some sort of resource management.

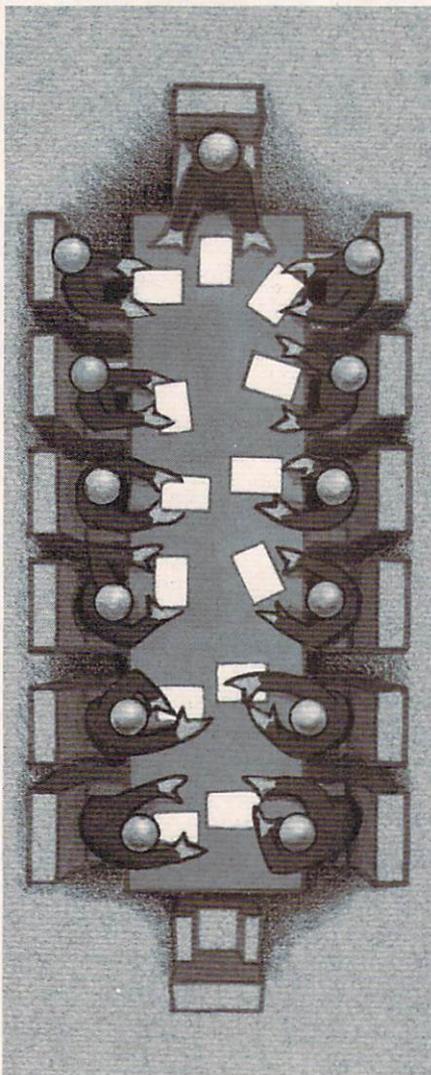
Cartels and Cutthroats (see review in the January FAMILY COMPUTING) and *Conglomerates Collide* (see review in the October FAMILY COMPUTING) are straightforward business simulations. In both, the action is based on the management and expansion of corporations through manipulation of stocks, bonds, and other holdings. In *Cartels and Cutthroats* you fight your way to the top by buying raw materials, manufacturing and advertising your product, and acquiring additional factories like any self-respecting chairman of the board would.

This complex game has been used for years as a teaching tool in economics classes. While *Conglomerates Collide* is considerably easier to learn than *Cartels*, both consist mostly of charts and tables representing the earnings and values you compete to acquire.

FOR SOMETHING MORE THAN QUARTERLY REPORTS

Straight business simulations can get rather dry. In my playtesting sessions, I've found that many players prefer more excitement

Thanks to some smart resource management, FAMILY COMPUTING's Games Critic, JAMES DELSON, has built a railroad empire criss-crossing the West, and masterminded an oil cartel's control of the world.



in their hours spent slaving over a keyboard.

For them, there's *M.U.L.E.* (see review in the February FAMILY COMPUTING). An outer space role-playing adventure along the lines of an intergalactic Monopoly set, *M.U.L.E.* incorporates serious money-management elements in a multiplayer treasure hunt.

M.U.L.E. requires players to grow crops or mine for minerals and auction them off at the end of each

round. Colorful graphics, zippy music, and even an arcade-game element or two all add to this riveting game. Likewise, *Run for the Money* (see review, this issue, page 127) adds some quick paced arcade action to a game of manufacturing and profit. In the end, with both these games, your ability to reason through financial matters, keep track of resources, and sell material at the right price determines your success or failure.

Many of the best games available today involve substantial amounts of financial planning. But they deal with subjects as varied as exploration in the great Age of Discovery—the late 1400s—(*Seven Cities of Gold*); the building of the American rail system (*Rails West!*); the oil business (*Oil Barons*); and even presidential campaigning (*President Elect*), in which you manage your candidate's ad and personal-appearance dollars to "buy" votes. Strategy in all these challenges revolves around a solid comprehension of how and when to use one's resources.

These resources take a variety of different forms. In *Seven Cities of Gold* (also by Ozark Softscape), you're responsible for equipping an expedition. Players are offered a choice of ships, operating crews, food to sustain the crew, and goods for trade to make voyages profitable. Through trial and error you learn what goes into mounting a huge campaign of trade, discovery, and conquest—especially after several expeditions have perished due to poorly projected needs.

WHAT'S THE CURRENCY?

The trick to mastering a game that uses financial management in the play system is to figure out what the "currency" is. In the case of

GAMES

Rails West! (see review, this issue, page 126), you're dealing with railroad companies. Players begin the game with a set amount of money. Then, through the acquisition of

stocks, bonds, land, existing railroads and their rolling stock, they try to build a profitable transcontinental rail system.

The key to using your holdings is

firmly rooted in real life. So, more than in any other game (except straight financial simulations) your comprehension of the marketplace, the banking community, the fluctuations in America's economy in the latter half of the 19th century, and other financial elements are crucial to success.

The difficulty level in this game is high, but the payoff, in terms of pride in achievement—win or lose—is enormous. When you finally figure out what you're doing, the thrill is comparable to getting an "A" on an exam.

BUSINESS SIMULATION GAMES

Baron, available for Apple II series/Macintosh, 48K (disk); C 64 (disk); IBM PC/PCjr, 128K (disk); \$39.95 (C 64); \$49.95 (Apple II); \$59.95 (IBM, Macintosh). Blue Chip Software, 6744 Eton Ave., Canoga Park, CA 91303; (213) 346-0730.

Cartels and Cutthroats, available for Apple II series/III w/emulator, 48K (disk); \$39.95. Strategic Simulations, 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043; (415) 964-1353.

Conglomerates Collide, available for Apple II/II plus/IIe, 48K (disk); \$39.95. RockRoy, Inc., 7741 E. Gray Road, Suite 6, Scottsdale, AZ 85260; (602) 998-1577.

Millionaire, available for Apple II series/Macintosh, 48K (disk); Atari 800, 48K (disk); C 64 (disk); IBM PC/PCjr, 128K (disk); \$39.95 (C 64, Atari); \$49.95 (Apple II); \$59.95 (IBM, Macintosh). Blue Chip Software.

Stocks and Bonds, available for Ap-

ple II series, 48K (disk); Atari Home Computers, 48K (disk and cassette); C 64 (disk and cassette); IBM PC/PCjr, 48K (disk); VIC-20, 5K (cassette); \$25 (disk); \$20 (cassette). Avalon Hill Game Co., 4517 Harford Road, Baltimore, MD 21214; (301) 254-5300.

Tycoon, available for Apple II series/Macintosh, 48K (disk); Atari 800, 48K (disk); C 64 (disk); IBM PC/PCjr, 128K (disk); \$39.95 (C 64, Atari); \$49.95 (Apple II); \$59.95 (IBM, Macintosh). Blue Chip Software.

Wall Street, available for Commodore 64; \$24.95 (disk); IBM PC/PCjr, 128K (disk); \$39.95. TimeWorks, Inc., P.O. Box 321, Deerfield, IL 60015; (312) 948-9200.

In the Chips, available for Apple IIe, 48K (disk); C 64 (disk); IBM PC/PCjr, 64K (disk); VIC-20, 8K (cassette); \$29.95. Creative Software, 230 E. Caribbean Drive, Sunnyvale, CA 94089; (408) 745-1655.

GAMES RELYING HEAVILY ON RESOURCE MANAGEMENT

Conqueror, available for VIC-20, 16K (cassette); \$24.95. Practicorp, 44 Oak St., Newton Upper Falls, MA 02164; (617) 965-9870.

Geopolitique 1990, available for Apple II series, 48K (disk); C 64 (disk); \$39.95. Strategic Simulations.

M.U.L.E., available for Atari Home Computers, 48K (disk); C 64 (disk); \$40. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403; (415) 571-7171.

Oil Barons, available for Apple II series, 48K (disk); C 64 (disk); IBM PC/PCjr, 64K (disk); \$40. Epyx, Inc., 1043 Kiel Court, Sunnyvale, CA 94089; (408) 745-0700.

President Elect, available for Apple II series, 48K (disk); \$39.95. Version planned for C 64 (disk). Strategic Simulations.

Rails West!, available for Apple II series/III, 48K (disk); Atari Home Computers, 40K (disk); C 64 (disk); \$39.95. Strategic Simulations.

Run for the Money, available for Apple II series/Macintosh, 64K (disk); Atari Home Computers, 64K (disk); C 64 (disk); IBM PC, 64K (w/DOS 1.1), IBM PCjr, 128K (disk); \$39.95; \$49.95 (Macintosh). Scarborough Systems Inc., 25 N. Broadway, Tarrytown, NY 10591; (914) 332-4545.

GAMES USING RESOURCE MANAGEMENT

Battle for Normandy, available for Apple II series, 48K (disk); Atari Home Computer, 48K (disk), 32K (cassette); C 64 (disk); IBM PC/PCjr, 64K (disk); \$39.95. Strategic Simulations.

Broadsides, available for Apple II series/III w/emulator, 48K (disk); Atari Home Computers, 48K (disk); C 64 (disk); \$39.95. Strategic Simulations.

Carrier Force, available for Apple II series, 48K (disk); Atari Home Computers, 48K (disk); C 64 (disk); \$59.95. Strategic Simulations.

Knights of the Desert, available for Apple II series/III w/emulator, 48K (disk); Atari Home Computers, 40K (cassette), 48K (disk); C 64 (disk); TRS-80 Models I/III; \$39.95. Strategic Simulations.

Parthian Kings, available for Apple II series, 48K (disk); C 64 (disk); \$25. Avalon Hill.

Ringside Seat, available for Apple II series/III w/emulator, 48K (disk); C 64 (disk); \$39.95. Strategic Simulations.

The Road to Gettysburg, available for Apple II series/III w/emulator, 48K (disk); \$59.95. Strategic Simulations.

The Seven Cities of Gold, available for Atari Home Computers, 48K (disk); C 64 (disk); \$40. Electronic Arts.

Tigers in the Snow, available for Apple II series, 48K (disk); Atari Home Computers, 40K (disk and cassette); C 64 (disk and cassette); IBM PC/PCjr, 64K (disk); \$39.95. Strategic Simulations.

NOT AN ESCAPE ROUTE

For those wishing an escape, pure and simple, financial-based resource-management games in general, are not the answer. Numerous playtesters have thrown up their hands in disgust at having to work through problems in such detail or study the mammoth manuals that often accompany such games.

If this is the case with players in your household, I'd suggest more light-weight fare. But even games such as Epyx's *Crush*, *Crumble* and *Chomp!* have a bit of finance manipulation buried in them.

NEXT GENERATION'S ECONOMIC ANALYSTS

Working your way through a difficult financial program has many varied rewards. By playing over a period of time, you'll pick up an education in business and economics which you'd never otherwise encounter in quite the same way. By learning how to follow trends in the marketplace, you'll gain a greater understanding of the economy, your personal finances, the stock market, and a host of other fields. Clear-thinking pays off in these challenges, as do traits such as advanced planning and rational, scientific deduction.

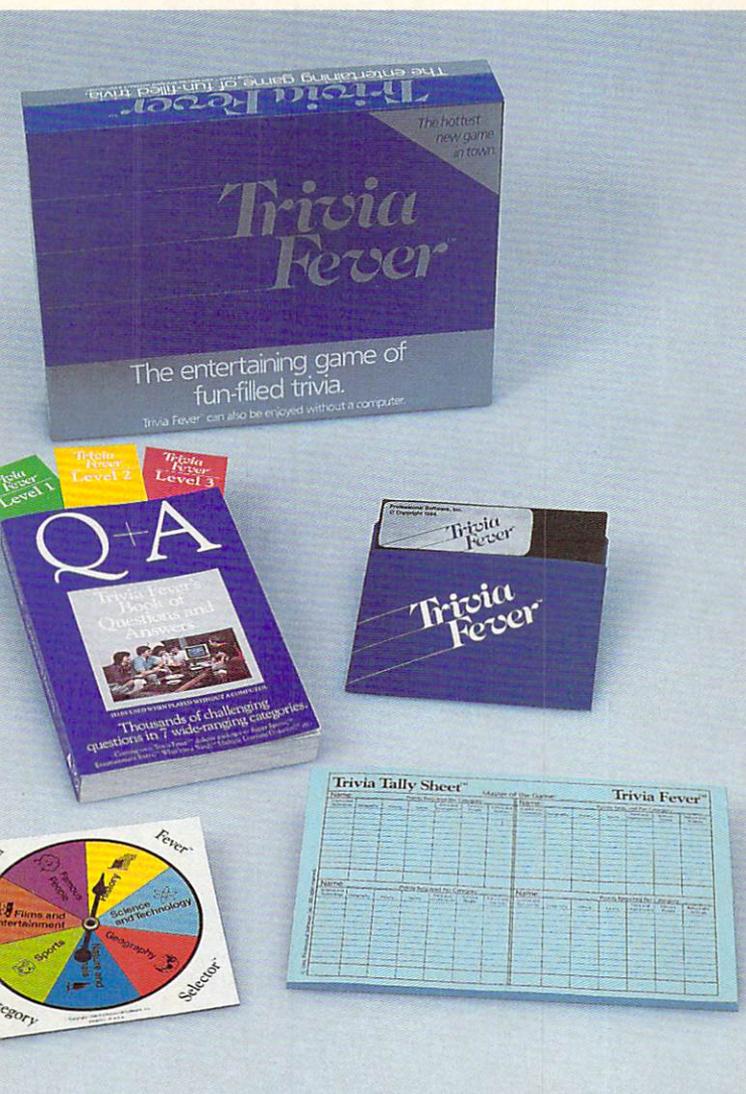
It may be too much to suggest that within a decade we'll have a new generation of economic analysts who got their first taste of financial thrills out of computer games. But our awareness of the economy and economic factors will no doubt expand and change thanks to the use of these number-crunching machines and entertainment software that successfully mix business with pleasure.

The accompanying box lists some programs that either feature, or incorporate, elements of finance- and resource-management. ☐

Catch

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**"The Hottest
New Game In Town"**



Trivia Fever is absolutely unique — it's the only software entertainment package that can be enjoyed **with** or **without** a home computer! When played on your home computer, Trivia Fever is a refreshing alternative to all those shoot'em up games. An elected "Master of the Game" uses the computer to randomly select subject categories, handicap players, generate questions and answers, keep score automatically, and more! Instructive by its very nature, Trivia Fever can be enjoyed by up to 8 individuals or teams. And when played without a computer, Trivia Fever has all the best features of the "popular" trivia games plus more — all without the cumbersome board, cards, and little game pieces. You can play in a car, on vacation, anytime, anywhere! And Trivia Fever is by far the best Trivia game available anywhere. Here's why:

Trivia Fever offers thousands of challenging questions in 7 interesting categories, so there's something for everyone. Each category has questions with 3 levels of difficulty, which score comparable points. What's more, Trivia Fever allows players to HANDICAP all those so-called "trivia experts" three different ways, giving everyone a chance to win. And players can easily control the length of play from quick thirty minute games to multi-hour party marathons!



Trivia Fever is unique, entertaining, educational, and most of all FUN. And at \$39.95, Trivia Fever is destined to quickly become the best selling software entertainment package of all time. There's even a \$5 rebate available to any non-computer users who return the computer diskette.

Trivia Fever can be enjoyed on the Commodore 64, IBM PC & PCjr and compatibles, Apple II series, and others. So don't delay. Catch Trivia Fever at your favorite software retailer today!

For additional information call 617-444-5224, or write to:

At \$39.95, Trivia Fever comes complete with Question and Answer Book, Category Selector, and Tally Sheets to be used when played without a computer.

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HOME-SCHOOL CONNECTION

WORD PROCESSING FOR KIDZ TO

Word processing for kidz to Word Processing: For Kids, Too

BY MINDY PANTIEL AND BECKY PETERSEN

Word Processing Deletes the Drudgery . . . and Lets Your Child's Creativity Shine

Is there a teenager in your house who believes creative-writing assignments are a form of medieval torture? Do your child's teachers rubberstamp "F"s on written reports because they can't make out the scrawl? Is writing thank-you notes to well-meaning aunts and uncles second only to taking out the garbage on your child's list of "Things I hate to do most"? If you answered yes to even one of these questions, then maybe your child is ready to enjoy the benefits of word processing.

Don't misunderstand. No software will transform your child into a Hemingway. Like all computer programs, word processing is a tool, not an end in itself. But what a tool! A good, simple word processor is a marvelous time-saver that can allevi-

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

ate many of the anxieties and hassles children often associate with writing. It can get them beyond the preoccupation with the physical appearance of reports, letters, and essays, and start them paying attention to what really counts—what they have to say.

THE "KEYBOARD EFFECT"

If nothing else, there is indication that using a keyboard can be educationally valuable. According to Dr. D. Midian Kurland, senior research psychologist at the Bank Street College of Education in New York, tests conducted as far back as the 1930s show a positive "keyboard effect."

"It is a proven fact that if you get kids writing on typewriters, they will write more, have fewer spelling errors, and write with more pleasure," he said.

Dr. Kurland says children write much longer pieces when using the keyboard, and they often write more than is asked of them. However, it's still not clear why. Is it because keyboarding is easier than writing, or because revision is easier? In either case, word processing has tremendous potential, according to Dr. Kurland. "People who write for a living wouldn't dream of giving up word processing. It's clearly a better way to write," he says.

We also know children write longer stories and essays when using a word processor, though the extent to which it actually improves their writing is still debated. One series of studies conducted at the Bank Street Children's School showed little difference between the quality of writing done by elementary students

on word processors and writing done with pencil and paper.

However, in the same series of studies, word processing proved its worth to handicapped children—children who viewed writing as a physical chore. Children with handwriting problems also benefited, because word processing takes the worry out of being labeled a "chicken scrawler."

Thomas Boudrot, computer coordinator for the Alief, Texas Independent School District, thinks word processing works, even for very young children. He said second graders in his district's "average" classes, who have been word processing for a year, "love it. And their writing is phenomenal. It has a flow—a beginning, a middle, and an end."

WHAT ABOUT TYPING?

The Alief schools teach second graders to touch type. Do your kids have to know how to type to word process? Undoubtedly, good typing skills help, but because correcting errors is so much easier with word processing, even children who "hunt and peck" can do well. In fact, if your child is already required to type term papers, as many schoolchildren are, a word processor may be the easiest way he or she can hand in a clean paper.

Fourteen-year-old Leah Williamson of Bladensburg, Maryland, who uses *AtariWriter*, agrees. "In my school, it's required that we be able to type, and I'm not that good a typist," she said. "So it's nice that it's easy to correct things with a word processor." →

What the successful student is wearing at school this year

This year go to school with designer originals from Advanced Ideas—programs that were made for you.

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Why do Advanced Ideas' programs wear so well? Features like our authoring systems and unique LearningWare™ library tailor our programs to your growing needs and extend their fascination and fun.

Advanced Ideas' full family of products are designed for all ages and most popular home computers. Why not try them on for size?

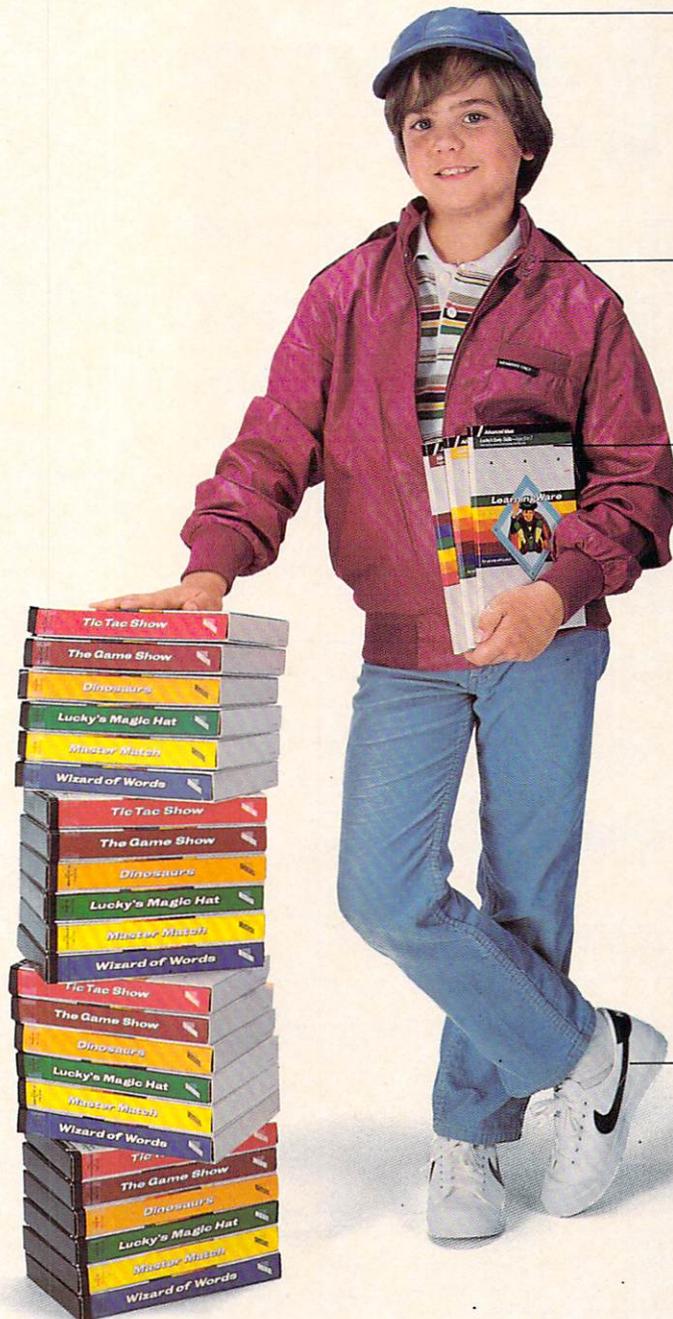
Headware

Outerware

LearningWare

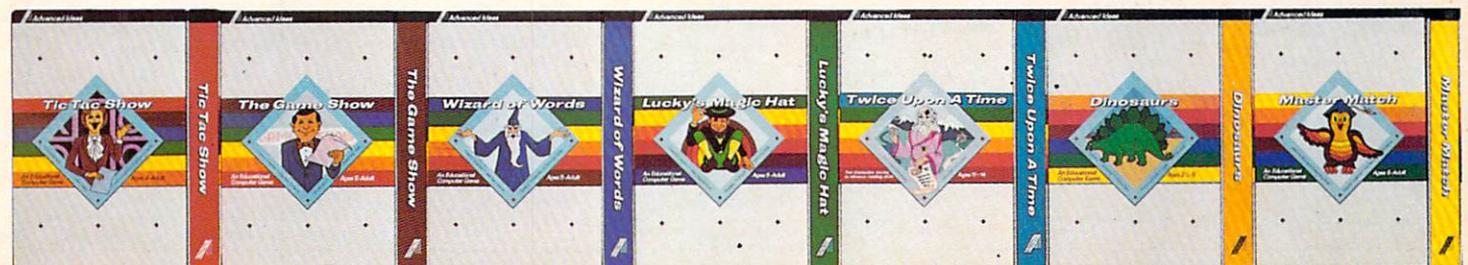
Add LearningWare diskettes to your Advanced Ideas' learning games and have a library of ready-to-use lessons on every topic at your fingertips.

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HOME-SCHOOL CONNECTION

SOFTWARE FOR YOUNG WRITERS

WORD PROCESSORS:

Here's a sample of relatively easy and inexpensive word-processing programs; for more information, see "Whistle While You Word Process" in the June FAMILY COMPUTING.

PROGRAM	MANUFACTURER	PRICE	HARDWARE REQUIREMENTS	COMMENTS
AtariWriter	Atari, Inc., 1312 Crossman, Sunnyvale, CA 94089; (408) 745-2000	N/A	Atari Home Computers, 16K	Cartridge-based, flexible, comes with good manual.
Bank Street Writer	Broderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 479-1170 School version by Scholastic Software, 730 Broadway, New York, NY 10003; (212) 505-3000	\$69.95 \$79.95 (IBM)	Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; IBM PC/PCjr, 64K	Designed specifically for young children.
Creative Writer	Creative Software, 230 E. Caribbean Drive, Sunnyvale, CA 94089; (408) 745-1655	\$49.95	Apple II series, 48K; Commodore 64; IBM PC/PCjr, 64K	Lots of HELP screens; can preview final product before printing.
Cut & Paste	Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403; (415) 571-7171	\$50	Apple IIe/IIc, 64K; Atari Home Computers, 48K; Commodore 64; IBM PC, 64K; PCjr, 128K	Easy to learn; uses on-screen menus.
Homeword	Sierra Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858	\$69.95	Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; IBM PC/PCjr, 64K	Uses pictorial "icons" to describe various functions.
TI Writer	Triton Products Co., P.O. Box 8123, San Francisco, CA 94128; (800) 227-6900	\$99.95	TI-99/4A, 48K (disk, w/printer)	Plastic "template" overlay helps you remember commands.
The Write Choice	Roger Wagner Publishing, 10761 Woodside Ave., Suite E, Santee, CA 92071; (619) 562-3670	\$44.95	Apple II series, 48K	Comes with typing program and style manual.

STORY PROGRAMS:

If your child's not quite ready for a full-scale word processor, here's a new twist: story-creation programs. Sometimes using pictures and a prewritten structure, these programs give your child help in writing his or her own stories.

Kidwriter	Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139; (617) 494-1200	\$26.95 (C 64), \$29.95 (Apple)	Apple II series, 48K; Commodore 64	Write—and add pictures. But no printing. (For ages 6+.)
Playwriter "Tales of Me"	Woodbury Software, 15 Prospect St., Paramus, NJ 07652; (201) 368-1040	\$39.95	Apple II series, 48K; Commodore 64; IBM PC/PCjr, 64K	Comes with materials for kids to create "books." (Ages 7-14.)
Story Maker: A Fact & Fiction Tool Kit	Scholastic Software, 730 Broadway, New York, NY 10003; (212) 505-3497	\$39.95	Apple II plus, 64K; Apple IIe, 128K (w/extended 80-column card); Apple IIc, 128K	Mix eight varieties of type with a "gallery" of pictures; print out "books" up to 12 pages. (Ages 8+.)
Story Maker	Sierra, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858	\$34.95	Apple II series, 48K; Atari Home Computers, 48K; Commodore 64	Graphics and mini word processor help kids develop characters and plots. (Ages 7-14.)
Story Tree	Scholastic Software, 730 Broadway, New York, NY 10003; (212) 505-3000	\$39.95	Apple II (w/Applesoft ROM); II plus/IIe/IIc, 48K; IBM PC/PCjr, 64K (DOS 1.1) or 128K (DOS 2.0 or 2.1)	For writing interactive, "adventure-style" stories with plot twists. (Ages 12+.)
That's My Story	Learning Well, 200 S. Service Road, Roslyn Heights, NY 11577; (800) 645-6564	\$59.95	Apple II series, 48K	Includes "starter stories" for younger children. (Ages 7+)

TYPING SOFTWARE:

Children can definitely word process without knowing how to type, but it helps. As it happens, computers are masterful typing teachers. Here are some programs that teach typing; for more information, see "The Keys to Success" in the March 1984 FAMILY COMPUTING, and this month's software reviews.

Keyboarding—Alpha-Pac	South-Western Publishing Co., 5101 Madison Road, Cincinnati, OH 45227; (513) 271-9970	\$89.25	Apple II plus/IIe, 64K; IBM PC, 64K; TRS-80 Models III/4, 48K	Traditional approach tells you how to sit, where to put your fingers, etc.
MasterType	Scarborough Systems, 25 N. Broadway, Tarrytown, NY 10591; (914) 332-4545	\$39.95	Apple II series, 48K; Atari, 48K; Commodore 64; IBM PC/PCjr, 64K	Shoot down "enemy words" by typing accurately.
9 to 5 Typing	Epyx, Inc., 1043 Kiel Court, Sunnyvale, CA 94089; (408) 745-0700	\$39.95	Commodore 64	Typing game and drill based on the Dolly Parton movie.
Touch Typing Tutor	Triton Products, Inc. P.O. Box 8123, San Francisco, CA 94128; (800) 227-6900	\$19.95	TI-99/4A, 16K	Both shoot-'em-up games and fingering drills.
Typing Tutor III with Letter Invaders	Simon & Schuster, 1230 Ave. of the Americas, New York, NY 10020 (212) 245-6400	\$49.95	ADAM; Apple II series, 48K; Commodore 64; IBM PC/PCjr, 64K. Joystick required.	Lessons plus practice; includes diagnostics with timing and keystroke analysis.
WizType	Sierra, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858	\$34.95; \$39.95 (C 64 cartridge)	Apple II series, 48K; Atari Home Computers, 48K; Commodore 64 (disk and cartridge); IBM PC/PCjr, 64K.	Typing tutorial with several skill levels—and the "Wizard of Id."

N/A Information not available at press time

(A subtle merchandising ploy)

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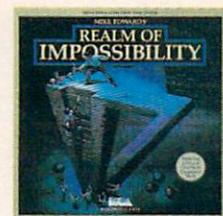
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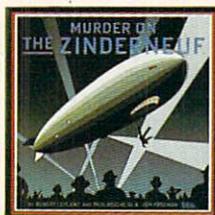
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HOME-SCHOOL CONNECTION

As Alief's experience shows, kids can learn touch-typing at an early age. Fortunately, computers are extraordinary typing teachers. There are several software packages that teach typing through drill, and through games such as "shoot-down-the-letter." (See accompanying chart, "Software for Young Writers.")

TRY, TRY AGAIN

Perhaps the best thing about word processing for students is that it encourages revision, which, according to many teachers, is both the most important part of writing and the hardest thing to get students to do.

Revision should mean more than copying a paper neatly and fixing spelling and grammar. Revision should be used to sharpen ideas and find the best, most accurate way to say something. Unfortunately, most students tend to view revision as an exercise in handwriting, not thinking. Enter the word processor. Suddenly you needn't recopy an entire paper to make a handful of changes.

"I asked our kids why they liked word processing," said Boudrot, "and they said, 'We can correct things without having to redo all the things we did right the first time.'"

Kate Fleenor, who taught word processing at the Jennings County, Indiana, computer camp last summer, found that kids loved to get printouts of their work. "Then they could look at it and see if it was exactly what they wanted. If not, they could move it around and print it out again until it was perfect. I think they were more conscientious than they would be using pencil and paper."

If it becomes easy to make changes, youngsters may become less resistant to constructive criticism.

AT-HOME USES

In addition to helping children with their school writing assignments, the word processor can be used to handle home writing tasks. For example, many parents have to strap their children to a chair before they'll tackle thank-you letters. With word processing, once the initial note is composed, appropriate additions and deletions can change a form letter into a note with a personal touch.

Of course, your child should resist the temptation to send an identical letter to every gift giver. The point of writing thank-you notes is to let people know you're thinking of them and are appreciative of what they've done. Ideally, the computer should make this task easier and faster, not less personal.

PICKING A WORD PROCESSOR

If your child's school is already using a good word processor, buying the same one for home use will preempt the need to learn a second set of commands. If that's not possible, how should you pick a program?

1. It should be easy to learn. For example, one widely used school program, *Bank Street Writer*, comes with a well-designed step-by-step introduction. (One added advantage to using *Bank Street Writer* is that a new spelling-checking program, *Bank Street Speller*, for Apple II series, \$69.95, from Broderbund, has been designed to accompany it.)

2. It should be easy to use. A word processor for children should not contain dozens and dozens of options, and it shouldn't require your child to memorize large numbers of complicated keystrokes.

3. Ideally, it should be forgiving. *Homework* and *Bank Street Writer* both allow users to UNERASE—bring back words they've erased but are having second thoughts about. More common is a feature that warns you when you're about to do something irrevocable—like erase an entire file that hasn't been stored. *Cut & Paste* and *Bank Street Writer*, among others, ask you to confirm deleting a file.

GIVE WORD PROCESSING A CHANCE

Writing has too often been treated as the weakest of the three Rs. This despite the fact that it's a useful skill in all subjects, and is a significant measurement of a person's ability to communicate logically. To write well, you must be willing to examine your work again and again. For the first time, that doesn't require enormous wasted effort. Some children may find that, with these obstacles out of the way, writing is no longer a chore but a joy. For them, the word processor may be more powerful than the pen ever was. **FC**

The END of DINKETY-DINK-DINK.

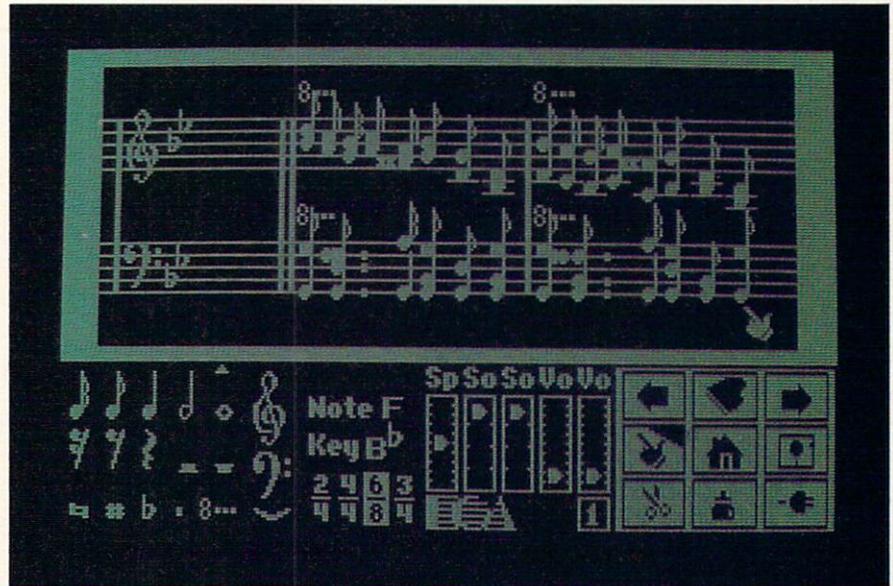
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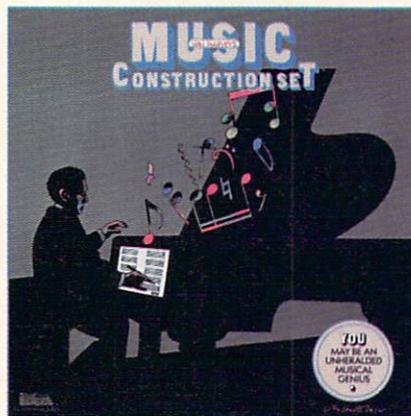
Take a good look at this screen because it, you, and a joystick are the whole story here.

That's you at the right end of the staff of notes — the little hand. Move the joystick, and you move the hand. Use it to carry notes up to the staff. Lay in rests, signatures, clefs, then point



to the little piano in the lower right and listen, because you'll hear the whole thing played back.

Move those little scales in the middle up and down to vary the music's speed, sound quality, and volume. Use



the scissors to cut out whole measures, then use the glue pot to paste them in somewhere else. Got a printer? Great. Print the score out and show it off to your friends.

But what if you're not up to writing your own stuff yet? No problem. There are twelve pieces of music already in here, from rock 'n roll to baroque. They're fun to listen to, and even more fun to change. (Apologies to Mozart.)

The point is, the possibilities are endless. But if you're still skeptical, visit your nearest Electronic Arts dealer and do the one thing guaranteed to send you home with a Music Construction Set in tow.

Boot one up. Point to the piano. And listen.

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TELECOMPUTING

A MAN, A WOMAN, AND A MODEM

How Jerry From Los Angeles and Janet From Chicago Met and Fell in Love

BY SARAH KORTUM

On Aug. 15, 1982, Jerry Yamaguchi, a freelance programmer, sat down at his TRS-80 Model I and logged on to CompuServe, a national computer network. It was 11 p.m., and soft jazz was playing in his darkened Los Angeles bedroom.

Meanwhile, Janet Stebbins was just getting home from the night shift at a nursing home. It was 1 a.m. in Chicago, and she immediately went to her dad's TRS-80 Model III and logged on to CompuServe, as she did every night after work.

Little did Jerry or Janet know that this night would change their lives. Four months later, Janet, then 18, would move to Los Angeles to be with Jerry, then 21. And now, two years later, they are engaged to be married.

Had they first met in person, they might never be together today, says Janet, who describes herself as "cautious." But meeting, as they did, on CompuServe's CB radio simulator, where people across the country converse by computer in the privacy of their homes, both Jerry and Janet

felt an uncanny sense of freedom. "I said a lot of things on CB that I wouldn't tell anybody else, simply because nobody [there] knew me," admits Janet.

They met under the handles (pseudonyms) "Op" and "Brandy." Jerry chose "Op" as an abbreviation from a utility software package he wrote, *Opsys II*. Janet reused the name "Brandy" from her old CB radio days during high school. Her reasons were sentimental: "When I was born, my father wanted my legal name to be Brandy. My mother kind of nixed that because she didn't want (the name of) an alcohol for a daughter!"

The group discussion that Jerry and Janet joined that evening centered on the identity of another CB regular. Janet had formed a pen-pal relationship with that person, so Jerry asked Janet to discuss him in private TALK (where two users can converse alone). They soon digressed to the normal topics for first-time CB acquaintances: WHERE ARE YOU FROM. WHAT DO YOU DO, HOW DID YOU FIRST GET INVOLVED IN CB?

"Initially, it's a lot of straight question/answer," says Janet. But as the friendship develops, the responses become longer, and people will "write paragraphs at a time, relating entire experiences in their past or describing certain elements in their life." Finding each other interesting, they arranged to talk the next day over the phone.

Little did they know that from then on, not a day would go by without their conversing. On the phone the next day, they continued to discover many similarities, and arranged to meet again that night on CompuServe.

LOVE IS BLIND

They had no idea what the other looked like. "Since all you're looking at is little white letters on a screen, you can't really build a human being out of that," says Janet. Soon "we

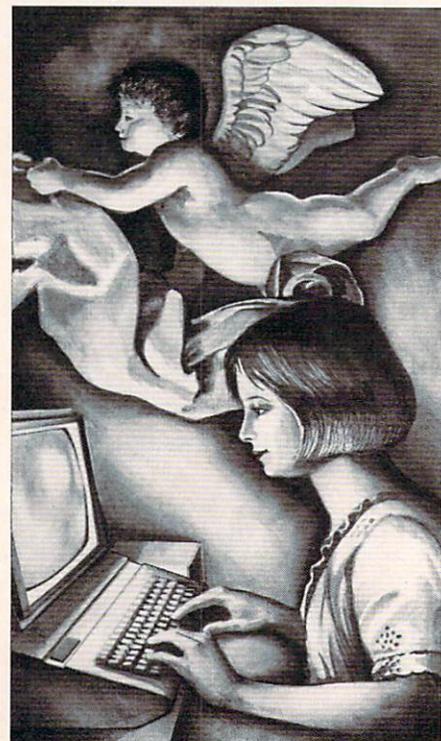
started asking for physical descriptions," and, several weeks later they exchanged photographs.

Once Jerry and Janet had a taste of telephone talk, "CB wasn't enough," says Jerry. "It wasn't as satisfying. You can talk over the phone, and in a much shorter time get a feel for the person. On the computer you have to describe, on the phone you can feel."

"And it gets very frustrating to have to keep typing," says Janet, who is a one-finger typist. "We'd be thinking faster than we could type." But in the evening, so as not to disturb their parents with their "giggling at 3 a.m.," they continued to converse over CompuServe, and used the telephone by day.

Jerry was the first to admit he was falling in love. Although they had known one another for less than a week, "during that week I felt like we had known each other for over a year. [Over CB] you get to know a person a lot faster," he explains.

Janet agrees: "When you meet somebody face to face, you have to



SARAH KORTUM is lifestyles editor of FAMILY COMPUTING.

ILLUSTRATION BY NICK JANSCHIG



LAST NIGHT, 39 MUSICIANS HAD A COMPUERVE CONFERENCE, SO DID 31 M.D.S, 49 SPORTS FANS AND 640 APPLE POLISHERS, AND NO ONE HAD TO LEAVE HOME.

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TELECOMPUTING

take certain steps to get to know them and slowly but surely work your way up to getting into personal subjects. Whereas, when you meet somebody on CB, people immediately act like they are best friends."

"We were having a fantastic conversation," recalls Jerry, "and I said, I THINK I'M FALLING IN LOVE WITH YOU."

"I didn't react!" says Janet. "Being a generally cautious person, I did not really think that emotions could be moving quite as quickly as they were." So she "kept the conversation very general and very vague." But when she hung up and had the chance to "do some thinking, I finally came up with the conclusion. 'Yes, this could be something big.'" Two days later, she responded that she loved him, too.

MOONLIT FANTASIES

In the beginning, meeting by modem had been "an advantage, because we got to know each other as mind and personality first, outside of the physical realm." But it was now a hindrance, says Janet. "I dreamt about coming out to California and taking a moonlit walk on the beach. But that's as far as I

could get: dreaming."

By now their CB colleagues suspected something was up. "One way you can tell that relationships are developing," says Janet, "is all of a sudden people won't spend a lot of time on open channel. It's like they'll immediately slip off into their own private little corner." But even on open channel their fellow CBers could sense a connection between the two. One night "this guy wrote, HMMMMM, DO I SEE SOMETHING GOING ON HERE? and both Jerry and I typed in GRIN at the same time. And he goes, OHHHHH, I SEE!" Afterwards, they got a flurry of congratulations about the start of another CompuServe romance.

But Jerry and Janet were not quite so open with their noncomputer friends. Janet's coworkers would ask her what she did with her free time "and I would try and explain and most of them just got very confused!" Two weeks into her relationship with Jerry, "questions started coming in from my parents. I couldn't exactly find the words to explain to my parents. They were going to think I was crazy!" When she finally told them the truth, "they

were completely distrustful of the whole situation. They said, 'It just can't happen. You can't fall in love by reading letters on a computer screen!'"

THE FIRST EMBRACE

Jerry didn't tell his parents, either, until two days before he was to fly out to Chicago to meet Janet in person. The date was Sept. 23, 1982. It was raining in Chicago. On the plane Jerry tried to calm his nerves.

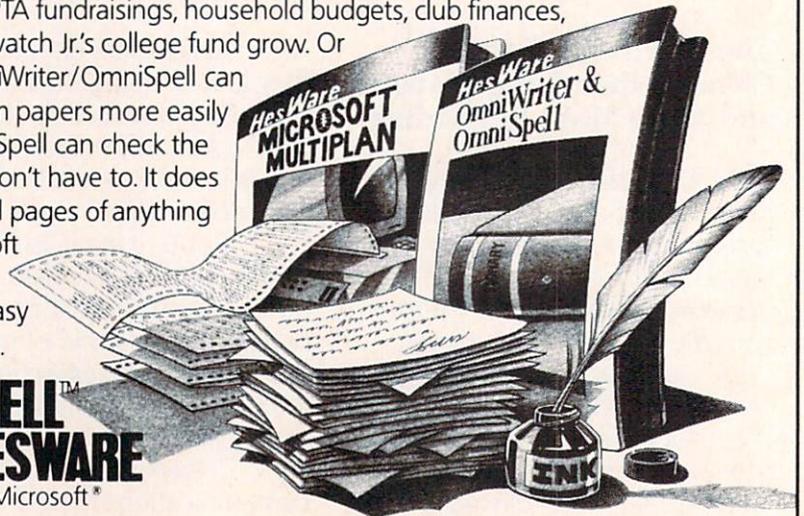
Meanwhile, Janet arrived at the airport two hours early, "so I had all that time to brood, knowing that he was somewhere between Los Angeles and Chicago! I'm a pacer. When I'm nervous I walk." So she paced the terminal, dressed in a carefully selected outfit of red corduroy pants and pink-and-white striped sweater.

When they first met eye to eye "we stood there for about 10 seconds. It felt like hours!" recalls Jerry. "I asked him how his flight was, all the general polite garbage," recounts Janet. "And we looked at one another and I said, 'Gee, after all this time, can I have a hug?' and so he kind of smiled and gave me a hug."

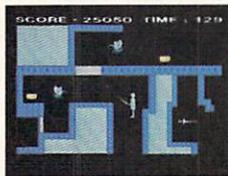
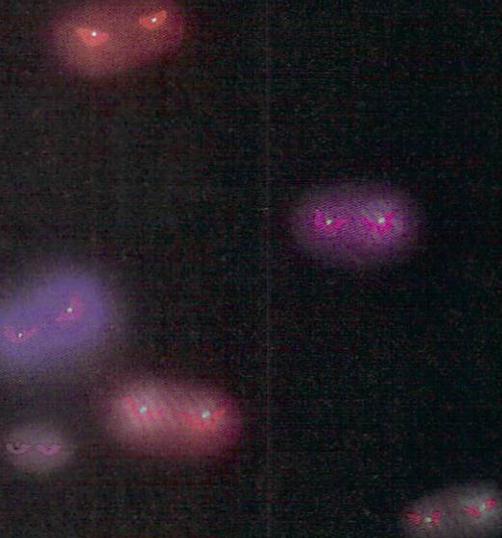
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You're in the Gateway to Apshai.™ The new cartridge version of the Computer Game of the Year,* Temple of Apshai.™ Gateway has eight levels. And over 400 dark, nasty chambers to explore. And because it's joystick controlled, you'll have to move faster than ever. But first you'll have to consider your strategy.

*Game Manufacturers Association, 1981

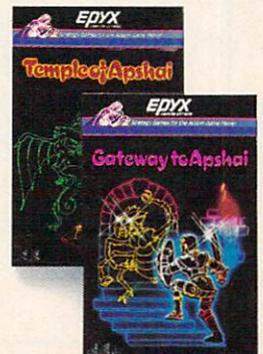
Is it treasure you're after? Or glory? You'll live longer if you're greedy, but slaying monsters racks up a higher score.

The Apshai series is the standard by which all other adventure games are judged. And novices will not survive.

They'll be eaten.
One player; Temple of Apshai, disk/cassette; Gateway to Apshai, cartridge, joystick control.



STRATEGY GAMES FOR THE ACTION-GAME PLAYER.



TELECOMPUTING

"We really didn't know what to say," continues Janet. "We would just sort of grin at each other—a lot of very shy, insecure-type smiles!"

After putting the luggage in the car, they climbed inside and then, says Jerry, they had "our very first kiss!" They spent the day talking and soon their nervousness wore off.

That weekend "there was tons of happiness" even a "giddiness" between them, says Janet.

After Jerry left, Janet became "incredibly depressed." But her depression lifted when they started making plans for their next meeting. Two weeks later, she flew out to Los Angeles for five days. Two weeks after that, Jerry flew to Chicago again.

By now their CompuServe and telephone conversations had taken on a different tone. They were beginning to consider getting together permanently. As things started getting "very heavy and serious," recalls Janet, "I started saying, 'Wait a second. This isn't making any sense at all. This isn't like me. First of all, I met him over CB. Second of all, I haven't known him forever and I'm thinking about picking up and moving my entire life!' Sometimes I

would stay awake and worry."

But when Jerry left after that third visit, Janet "could not deny that I missed him incredibly. I decided that I was willing to give up what I had in Illinois to go out there."

On Nov. 11, 1982, Jerry's birthday, Janet moved to California. She "wasn't nervous because I was confident that Jerry was going to be there on the other end, waiting for me. At least that was going to be happy. The hard part was saying good-bye to my family." From the moment she stepped on the plane she "was crying until I got out in California. But as soon as I got off the plane I knew I had made the right decision."

Janet and Jerry now live in Torrance, California, where Janet is a nursing assistant and Jerry is a systems programmer for a national computerized tax service. Ironically, the couple now help others meet via computer through a computerized bulletin board they started last January called THE ADVICE FORUM, which features a matchmaking service.

Now that two years have elapsed, it never enters their minds that they first met on CB, says Janet, "be-

cause everything is so natural. I never think we are special or anything." But others do, especially those "who don't even touch computers. They just find Jerry's and my relationship very freaky . . . kind of futuristic!"

"When people ask me about it," continues Janet, "I just kind of say it's like a science-fiction romance novel! It's something that could not have happened 10 years ago. The capability was just not there. But it could very well be much more developed in the coming years." And soon there may be a whole new meaning to the concept of first date. ☐

ELECTRONIC EDITION

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

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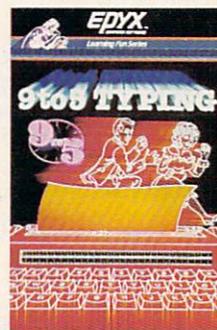
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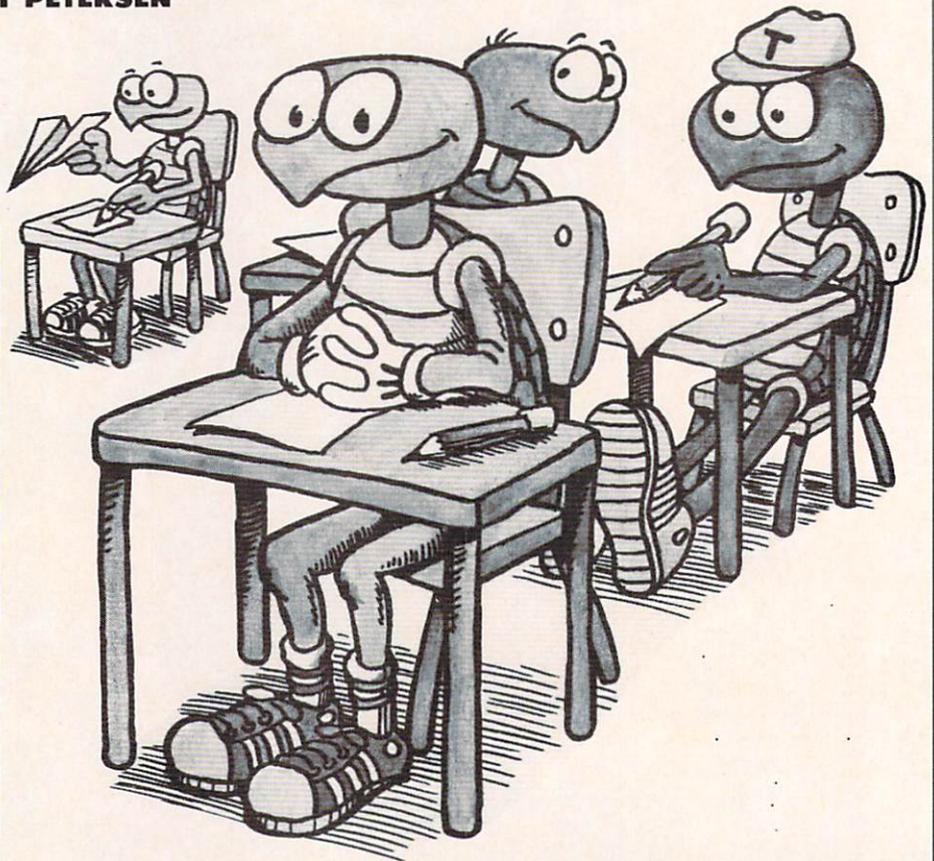


LEARNING LOGO

EDUCATING YOUR TURTLE

Once You Teach It to Do Things Your Way,
It'll Never Forget

BY MINDY PANTIEL AND BECKY PETERSEN



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

This is the third of six articles on Logo. Different versions of Logo vary somewhat, so we suggest that if you have Logo, you get out your manual as a companion to this article. That way, you can pinpoint any variations quickly. If you don't have Logo, this series can still serve as a good introduction. The important concepts behind Logo remain the same from version to version.

Now that you know most of the basic turtle graphics commands, you're ready to write some actual programs—or "procedures," as they are called in Logo.

Procedures help make Logo excitingly different from many other computer languages. Here, you teach the computer how to do something—and it learns, so whenever you want the turtle to do it again, you can just ask.

We'll discuss creating ("defining") Logo procedures, editing and debugging them, and, finally, using them as building blocks in more complex programs. We'll also discuss saving your procedures on disk.

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

DEFINING PROCEDURES

Defining a procedure is a four-step process.

1. Enter the EDITOR mode. Until now, you've been working in the DIRECT mode. As soon as you typed in a series of commands (such as RT 90 FD 30) and pressed ENTER, the turtle did your bidding (in this case, turning right 90 degrees and then moving forward 30 steps).

Now, you'll have to go into the EDITOR mode. Type the word TO. Don't press ENTER yet.

2. Name the procedure. After TO, type in the name you've chosen for your procedure. It can be any word or series of letters (except one that's already defined or used as a command), but for your convenience it should describe the shape you're defining—for example, TO SQUARE.

As soon as TO SQUARE is entered, the screen image will change, and

you'll be able to write your procedure.

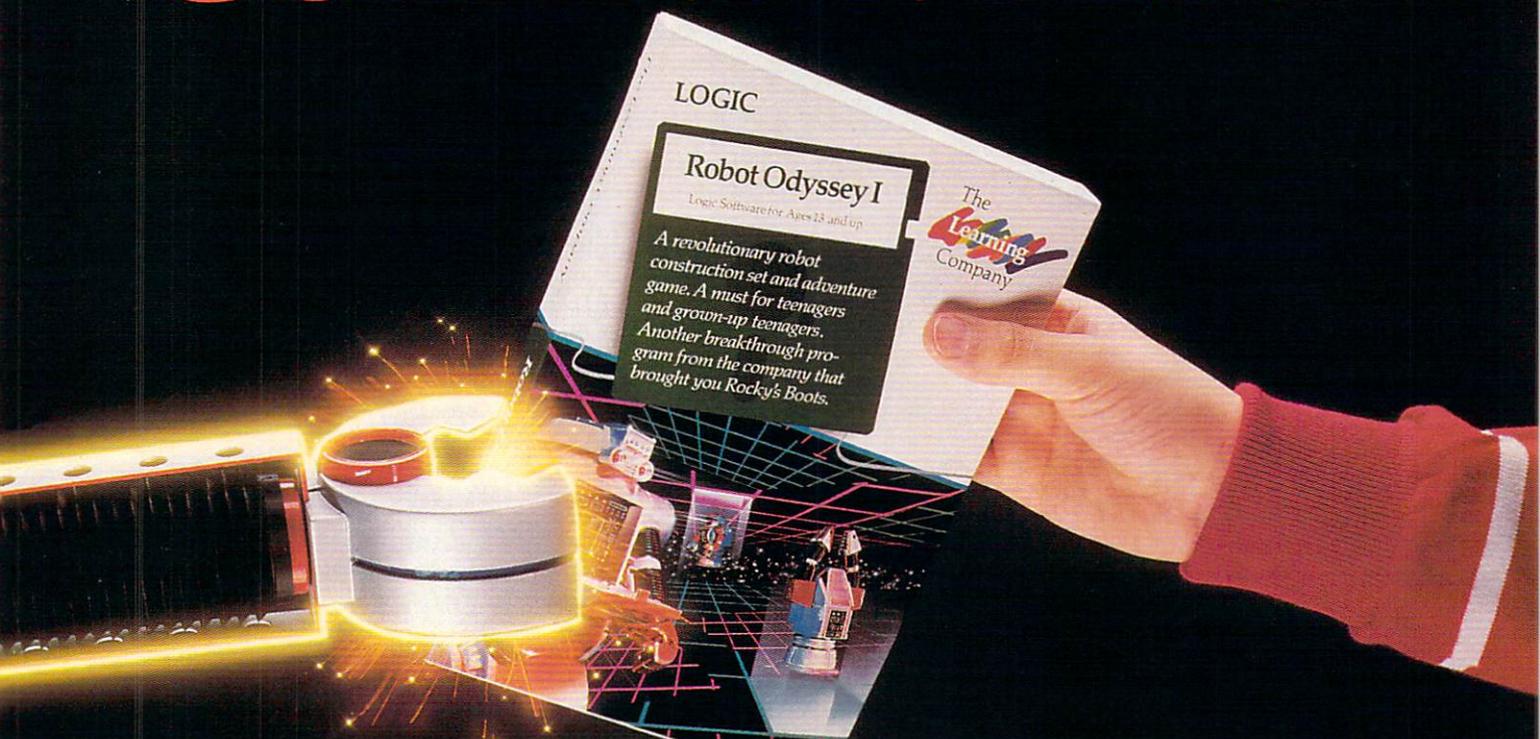
3. Enter your commands. Beginning on the next line, write the commands that tell the turtle how to make the desired shape. Of course, commands must be entered in the right order. In the example TO SQUARE, we'll use the command we developed last month: REPEAT 4(FD 50 RT 90).

4. End the procedure. The final step in defining a procedure is to end it, and to return to the DIRECT mode, so you can test it. In some versions of Logo, typing END does that; in others pressing CONTROL-C or the ESC key does it.

Here's what TO SQUARE looks like:
TO SQUARE
REPEAT 4(FD 50 RT 90)
END

Of course, the more complicated drawings you'll do later will require more complicated procedures. →

LEARNING & FUN GO HAND 'N' HAND



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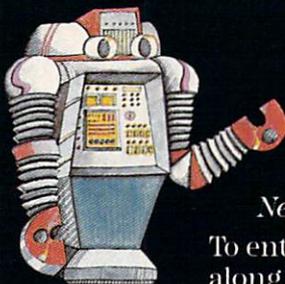
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LEARNING LOGO

Now that you're back in DIRECT mode, type in the word SQUARE and see if the turtle makes the square you wanted it to. Unless you revise the procedure later or turn the computer off without saving it, every time you type SQUARE the turtle will respond by making this shape.

The four-step process for defining a procedure is fairly easy to learn. Even 6- and 7-year-olds can handle it with a little help, and preschoolers can learn to call up procedures written by their older siblings, even if they can't write their own.

EDIT THOSE BUGS

But what if your procedure has a bug in it? What if it doesn't make the shape you wanted, or you get a message on the screen indicating there's a problem somewhere? Time to debug.

1. Go back to the EDITOR mode. In some Logos, you do this by typing TO, followed by the name of the procedure. In others, you use a special command, EDIT, followed by a quotation mark (") and the name of the procedure. For example: EDIT "SQUARE. Other versions do it differently—check your manual.

2. Figure out where the problem is. First, look carefully for misspelled commands or forgotten number values. Often, the computer will give a gentle prompt such as SQUARE DOESN'T LIKE DF AS INPUT when you've made that kind of mistake. You can often find out where you tripped up by seeing where the turtle tripped up. For example, if it made your square correctly and then went the wrong way to make your triangle, you should check which direction you sent it in after you finished the square. You may have to go back to a procedure several times to fix all the bugs.

3. Move the cursor to the place in your listing where you found the problem and make your changes. Some versions of Logo offer easy editing; you just have to learn a couple of commands and use your cursor-control keys. Other versions are tougher in some cases because they are more powerful.

4. Return to the DIRECT mode. (This, too, may require a special command.) Now, retest the procedure to see if the problem has been fixed.

A PROBLEM-SOLVING TOOL

Parents, take note: Debugging is

where the development of problem-solving skills really takes place as young programmers work toward perfecting their procedures.

Most procedures of any length will have bugs at first. In the beginning, many children show little tolerance for errors, and will need your help

THE FAMILY CHALLENGE

Your family can work together to use one procedure as a building block for more complex procedures. You'll all get a chance to define your own procedure, but you'll each have to use one defined by someone else in order to get yours to work. When you finish, you'll have a forest.

Family Member No. 1:

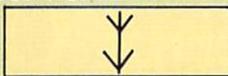
Write a procedure that makes this shape:



Call it TWIG. (Remember, start by typing to TWIG.) We suggest that the youngest member of the family defines this shape, since it's the easiest one. The length of the sides of the v shouldn't exceed 15 turtle steps if the final forest is to fit on the screen, and the last step in the procedure should return the turtle to the same location and direction in which it started. (This is usually a good idea.)

Family Member No. 2:

Write a procedure that makes this shape:



Call it BRANCH. Remember that the turtle now recognizes the command TWIG. Use TWIG in defining this second procedure. The branch should not be longer than 50 turtle steps, and again, the last step in the procedure should return the turtle to the exact position where it started.

Family Member No. 3:

Write a procedure that makes this shape:



Call it SHRUB. Remember to use the BRANCH as a command in this procedure. Use the REPEAT command as a shortcut in making all of these branches.

Family Member No. 4: Write a procedure called TREE that combines SHRUBS. No hints on this one. Put your heads together—a perfect tree should be the result.

All together now: Here comes FOREST. See if you can put together many trees in a scene that depicts a forest.

and encouragement. However, most gradually develop a willingness and even an eagerness to find the problems and refine their programs.

SAVE THAT PROCEDURE

At this point, your procedure is in the computer's memory, but it hasn't been saved to disk. As with any other program, if you shut off the computer before you save your work, the work disappears.

The specifics of saving procedures differ from Logo to Logo—again, check your manual. You always have to use a properly formatted disk. Formatting a Logo data disk sometimes involves loading a special formatting program that's on your Logo disk or on an accompanying utility disk. Then you insert a blank disk and follow the directions shown on the screen.

When you're done formatting, type SAVE, usually followed by a quotation mark and the name of the procedure you want to save. In some Logos, you have to give the computer a little more information. For example, Atari Logo requires you to tell the computer whether you're sending your file to a disk drive or a cassette recorder.

At the beginning of your next work session, a READ or LOAD command, combined with the file's name and any other information your computer needs, will take your procedures from the disk and put them back in the computer's memory. Now, you can continue as if the computer had never been turned off.

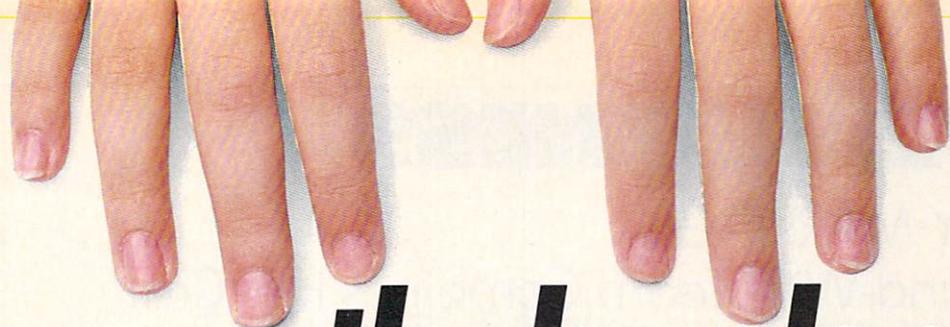
MORE POWER TO LOGO

It's appealing to be able to call up your Logo creations to show them off, but there's a far greater advantage to defining and saving procedures. Once you've defined a procedure, it becomes one more command the computer understands all the time, just like FD, BK, LT, and RT. It can be used as a command in other, more complex procedures. For instance, SQUARE as we've defined it can be used as the basis for a new procedure named WINDOWS:

```
TO WINDOWS  
REPEAT 4 [SQUARE RT 90]  
END
```

This combines four squares to resemble the panes of a window.

"Family Challenge" this month also gives you practice in defining procedures and then using them in more complex procedures. ☐



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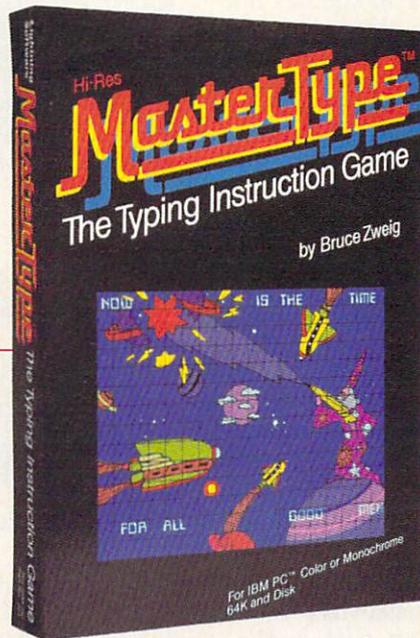
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HOME BUSINESS

A HAPPY MARRIAGE

A Husband-Wife Team Combines Her Craft with His Computer Skills

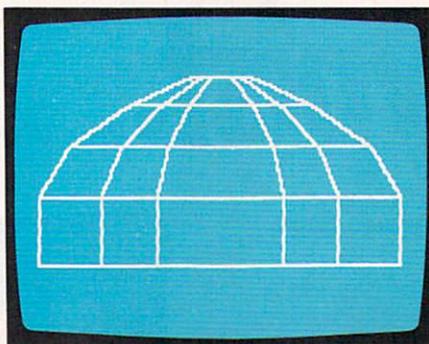
BY MINDY PANTIEL AND BECKY PETERSEN

When customers call the Lichtenauers to order a handcrafted stained-glass lamp, they are invited to the house to discuss their ideas over coffee. Seated at the kitchen table, Cheryl, 33, and Steve, 38, encourage each customer to describe the type of design he or she has in mind. Little by little, the overall concept of a tiered, glass shade specially suited to the customer's home starts taking shape. As suggestions for sizes and space relationships are bandied about, Cheryl sketches the lamp's outlines on paper.

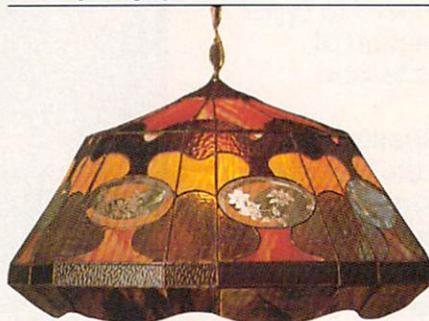
The next step for many home-based craftspeople would be to show the customer a clean, detailed drawing at a later date, complete with exact proportions and a price estimate based on the amount of materials and work hours required. But not for the Lichtenauers. As soon as the rough idea is on paper, they take the customer down the hall to the family computer room. There, using a program Steve designed, the Lichtenauers transform the pencil sketch into a computer graphic of the delicate lamp they have just discussed. The computer also calculates the specifics of the design, such as the number of tiers, the number of glass panels in each tier, and the exact size of each one. Within minutes, the customer has a precision drawing of the lamp shade, and Cheryl knows the exact dimensions of each piece of glass she'll need for the project, and how much glass to order.

The greatest advantage offered by the computer graphic, however, is that it enables the designer and buyer to review the aesthetics before a single piece of the expensive colored glass is cut. Materials alone for such lamp shades can cost from \$50 to \$100. If, after examining the graphic on the screen, one tier seems overpoweringly high or appears to have too many panels, the Lichtenauers can easily make alterations and produce a modified graphic incorporating changes and new ideas.

MINDY PANTIEL and BECKY PETERSEN are FAMILY COMPUTING contributing editors and are the authors of the six-part series on Logo.



The computer graphic.



A lamp shade designed using the Lichtenauers' program.

Cheryl's studio shares basement space with the computer. With the two close to each other, customers can easily examine actual stained-glass pieces and get a feel for possible colors and textures as they work with the graphic on the screen. Only seconds after the final decisions have been made, the computerized rendition is complete. With an exact design and all calculations at their fingertips, both the Lichtenauers and the buyer can feel secure that the final product will precisely meet their expectations. They also know the exact cost in advance (Cheryl will charge up to \$300 for a lamp).

WHAT? NO PROFIT?

A couple of years ago, when Cheryl started making stained-glass pieces for friends and neighbors, she discovered that next to window hangings and decorative ornaments, multi-tiered lamp shades were the most popular works in her repertoire. Unfortunately, they also turned out to be extremely time-consuming to design and produce.

"From a time and money standpoint, they were real losers," Cheryl admitted. "But, if it weren't for the tedious trial-and-error construction-and-design methods, the lamp-shade projects would have been fun," she added. "Something had to be done if they were ever going to be worth the time involved."

The planning time alone required an investment of six to 10 hours at the drawing board. This, added to the high cost of colored glass and another 70 to 80 hours of actual construction time, makes it easy to see why handmade Tiffany-style lamps often cost up to \$250.

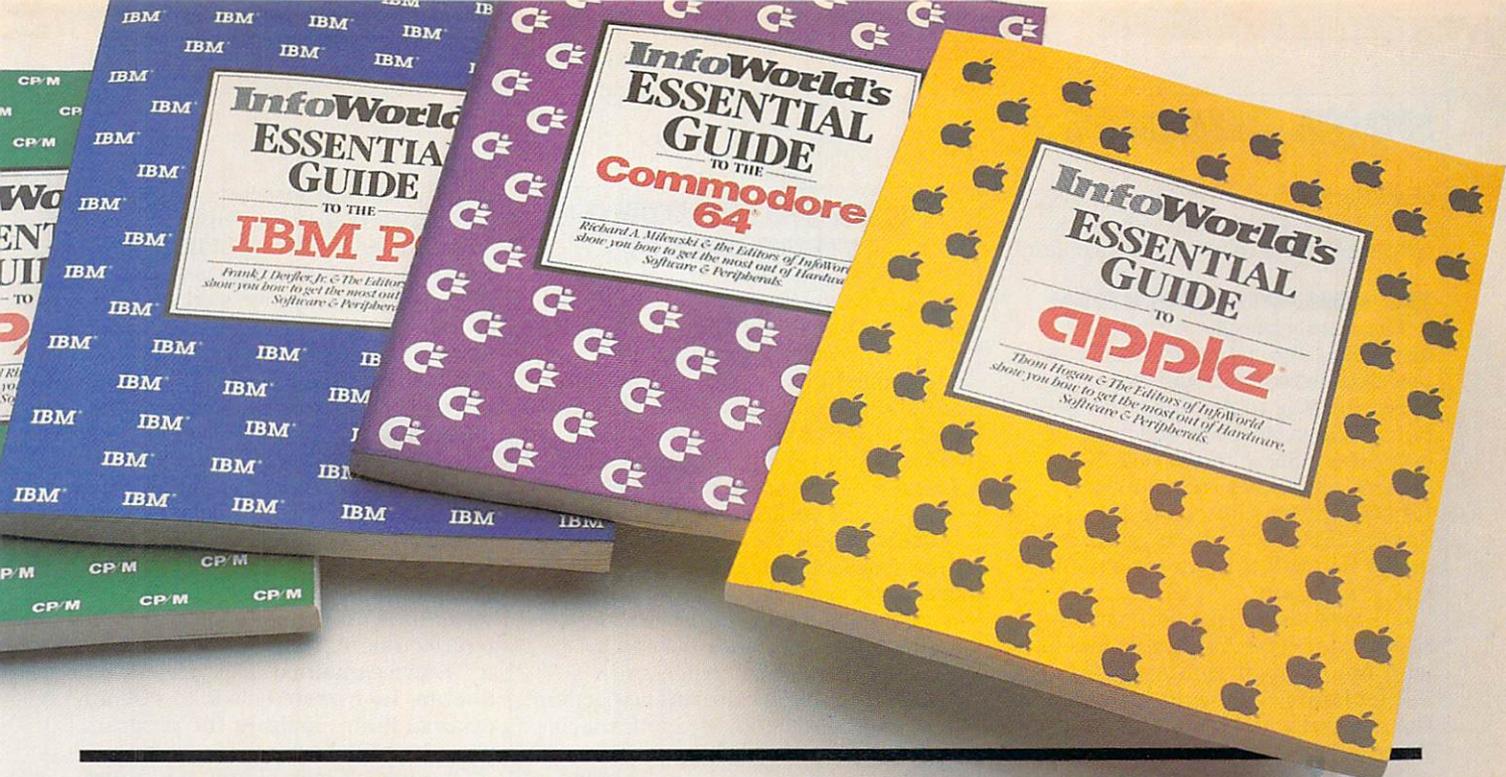
A team effort—Cheryl, Steve, and an Apple II computer—helped solve the time aspect of the stained-glass problem. And, quite unexpectedly, it also involved the Lichtenauers in a new home business: that of authoring and marketing Steve's *Lamp Design Program*.

TOO MUCH TIME

Cheryl had her first encounter with stained glass five years ago in an adult-education class in Cedar Rapids, Iowa. It wasn't until three years ago, however, when Steve's job as a sales engineer precipitated a transfer to Apple Valley, Minnesota, that Cheryl got serious about the craft. Cheryl's original intent was simply to take on a new hobby. But not too long after her arrival in Minnesota, and one advanced course later, Cheryl undertook her first multi-tiered lamp shade. From there, her hobby grew into a business.

Trial and error seemed to be the best way to figure out the dimensions for a custom piece. For that first lamp, Cheryl cut out cardboard patterns for each glass piece and tried fitting them together. Later, she adjusted the design by shaving sliver after sliver of glass until the pieces fit and the design seemed right.

From this somewhat rough beginning, Cheryl and Steve decided they needed to simplify the process of getting from a basic sketch to a workable pattern if their home business was to take off and become profit-



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HOME BUSINESS

able. So Steve put his second avocation—home computing—to work helping Cheryl to solve the problem.

THE COMPUTER SOLUTION

The family bought a computer four years ago, when the decreasing prices of personal computers gave Steve the bug to get one. He's been using it as a problem-solving tool ever since. Steve took several programming classes in graduate school, and has since taught himself Applesoft BASIC, which is the language he used to create the lamp shade program.

On most any night you can find Steve alone or working in tandem with one of his daughters—Andrea, 3, Stephanie, 7, or Angela, 15—at the computer in the basement. When he's alone he writes programs of his own or works out bugs in ones his friends have designed. When he and the girls work together, they use educational programs or play strategy-type games.

As soon as Cheryl shared her frustration that vast time investment was inhibiting her lamp shade production, Steve headed down to the basement primed for the challenge. Approximately 50 to 60 hours later, he had the first prototype of the lamp shade program ready for Cheryl to try. From that point on, it was a team effort, with Cheryl making practical suggestions as to how the program could be made more functional while Steve did the fine-tuning. "It's just that kind of a challenge that sends him to the computer," Cheryl explained. "His favorite thing to say is 'That's not hard, we can use the computer to . . .'"

Now Cheryl simply turns the computer on, inserts the *Lamp Design Program* disk, and types RUN. The computer does the rest.

THE PROGRAM

The *Lamp Design Program* leads the user through the design development by asking all of the questions necessary to complete a plan. Usually the answers are based upon the pencil-sketches draft. The computer keeps asking questions until it has enough information to execute all the calculations.

As soon as this information is entered into the computer, a side-view drawing like the one above comes up on the computer screen. The user immediately has a correctly proportioned version of the rough drawing.

Changes can be made easily and quickly if the artist or buyer isn't

COMPUTERIZING YOUR CRAFT

Using a computer can take the drudgery out of many crafts and hobbies. Whether you macrame wall-hangings, knit sweaters, throw pots, or do any other specialized craft for profit or pleasure, your computer can speed up the design process or act as a memory bank. Here are a few ways to put your computer to work:

Use a simple data-base program. Keep track of your clients, their orders, and their payment records if your craft is for profit. Use it for mailings and promotions, too.

Try a spreadsheet program. Streamline the accounting aspects of your business hobby by computerizing your records of short-term expenses, overhead, taxes, and how much material you've purchased and at what cost. Retrieve them at any time with just the press of a button.

Look at commercial software. A number of programs on the market are particularly suited to crafts involving complex design repetitions, ratios, or other exact calculations. (*Weavers, look at FAMILY COMPUTING's November 1983 Home Business.*)

Write your own program, or ask a friend versed in programming to write or adapt one for you.

Contact your local computer users' group or hobbyist club. If you can't find software suited to your craft needs, someone else may have found or written a program you can use. If you are a member of a computer bulletin-board service (BBS) or telecomputing network, post a notice on the public message board informing others of your needs.

satisfied with the computer graphic. The number of sides and tiers, the heights, or whatever, can be revised using simple editing commands from the main menu. The user also can request to see a top view.

When it comes time to build the lamp, Cheryl can recall the design from the disk and ask the computer to calculate the exact panel sizes or the amount of glass she must purchase. Once the computer has done its work, Cheryl is ready to start cutting glass.

TURNING INTO A SOFTWARE AUTHOR

An unanticipated outgrowth of the Lichtenauers' successful effort to make designing stained-glass lamp shades easier, has been production

of software that interests other stained-glass artists. Through word of mouth and a little publicity in *Glass Studio Magazine* last year, Cheryl and Steve have sold 15 copies of their program. Admittedly, the market for a program for crafters of stained glass is limited. Nonetheless, the Lichtenauers continue to receive more inquiries each week.

When the first request for the program came in, Steve panicked. "It's one thing to write a program for your family to use and quite another to make it [simple] for others who are going to use it based on the instructions on the disk and the written documentation that goes with it," Steve explained. Despite his doubts, he invested close to 100 additional hours making the program what he calls "really user-friendly."

One user, Clyde Wynia, a stained-glass enthusiast from Marshfield, Wisconsin, confirms the success of Steve's effort. "The program isn't user-friendly, it's user-proof. No, it is downright affectionate! You just can't do it wrong."

Wynia, who is both an attorney and an avid craftsman, sees the *Lamp Design Program* as a real boon to his stained-glass work for several reasons. "First, it allows me to design right on the screen without erasing and drawing over and over again. Then, it lets me see what the outline and proportions are going to be like.

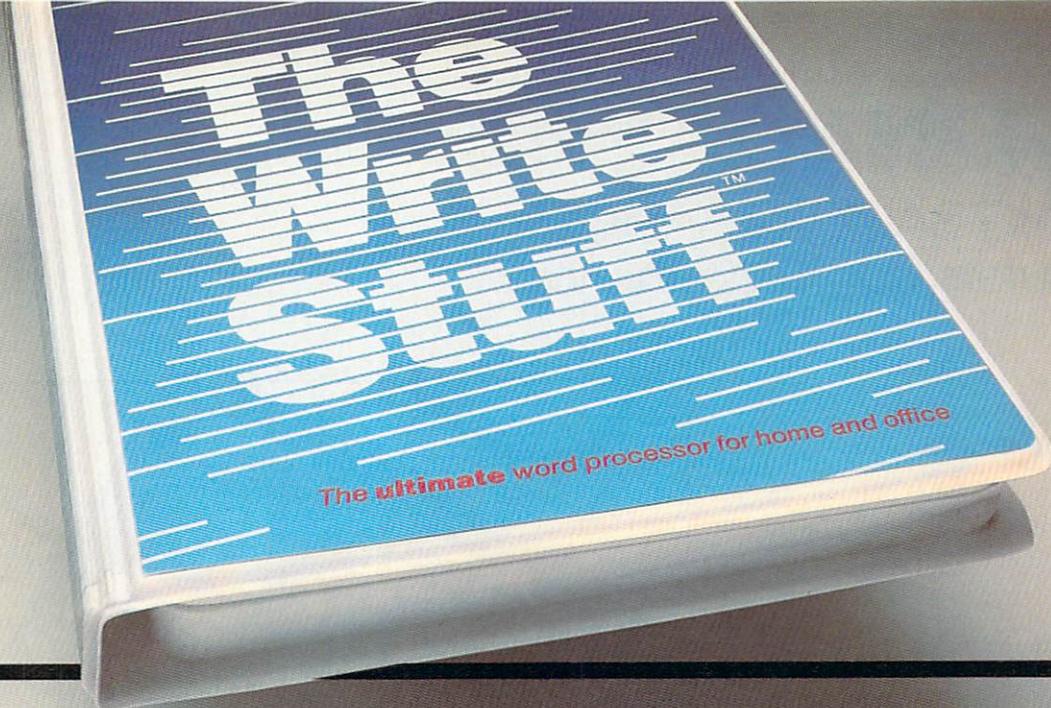
"But, best yet, it relieves me of having to do all of the mathematics involved," he adds.

THE BEST OF BOTH WORLDS

Cheryl and Steve have discovered that making stained-glass lamp shades is not only fun but a profitable pursuit as well, now that their computer is in on the action. And their home business has enabled them to wear a second entrepreneurial hat—as software designers. Now, when Cheryl and Steve head for their shared basement workshop, it's not always Steve to his corner and Cheryl to hers. These days, they sometimes both go to the computer.

The *Lamp Design Program*, which runs on Apple II and IIe computers and comes complete with instructions, is available from the Lichtenauers for \$30. They will be happy to answer any specific questions if the request is accompanied by a self-addressed, stamped envelope.

Steve and Cheryl Lichtenauer
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Apple Valley, MN 55124 **FC**



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ON-LINE

GETTING BACK TO BASICS Computers Can Lead the Way

BY EUGENE MAIER

As a mathematics professor and instructor of math teachers, I often hear the argument that students ought not be allowed to compute with calculators and computers until they have mastered the paper-and-pencil techniques we adults learned in school. These techniques, I am told, are basic mathematical skills.

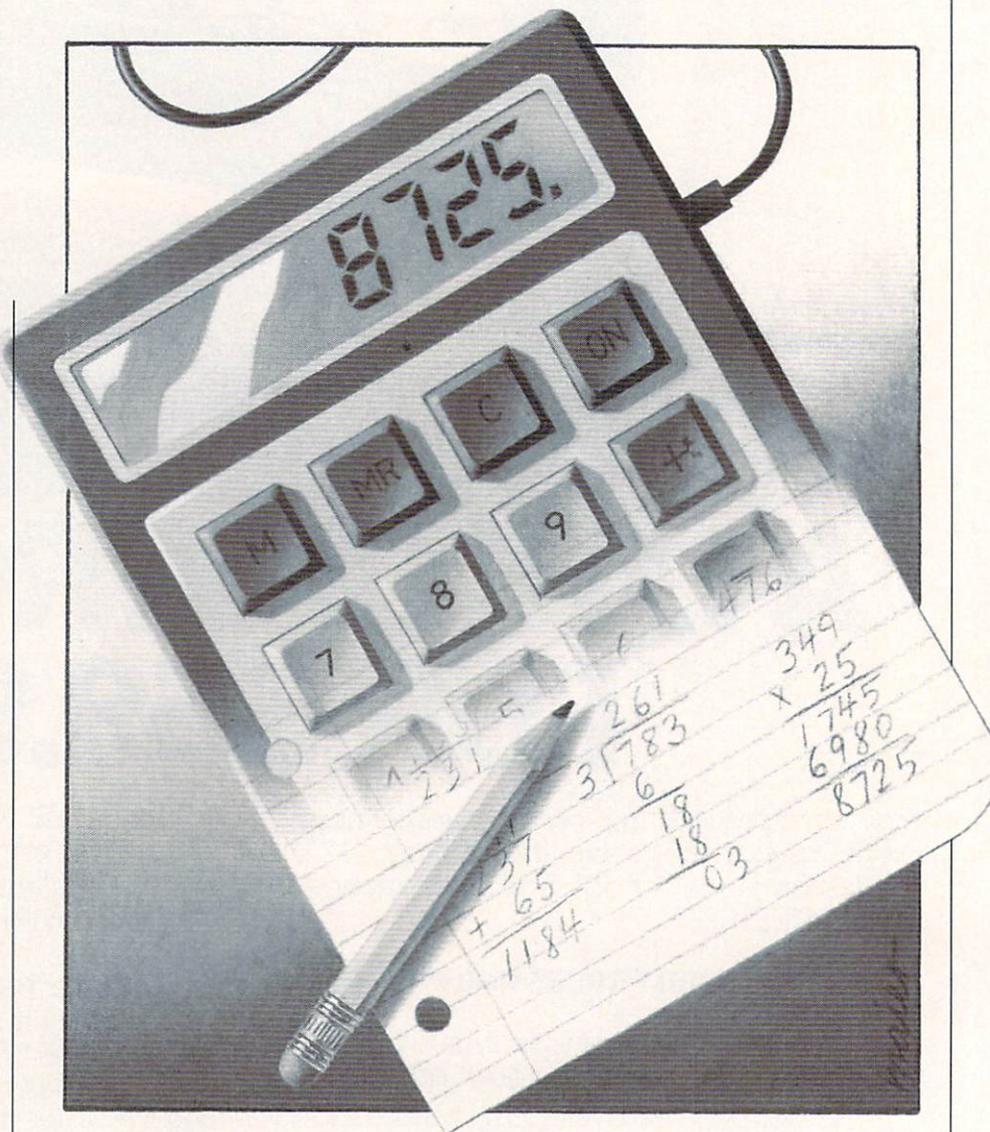
I disagree.

Let me illustrate my point. Suppose you see an ad for a 12-ounce package of smoked sausages for \$1.68. "How much is that per pound?" you ask yourself. There are several ways to proceed. You may decide to find the price per ounce and multiply that by 16. You may decide to determine the price for 4 ounces and add that to the 12-ounce price. Or, you may decide on some other procedure.

Whichever process you choose, you cannot arrive at the desired result without first deciding what computations need to be done. Once you know what computations you'll need to do, you have a number of options. Using paper and pencil is only one of these options.

If the numbers are manageable, I find mental computing to be the most convenient—no external tools necessary. (In this instance my thought process would go like this: $168 \div 12$ is the same as $42 \div 3$ and that's 14; 14×16 is $160 + 64$, or 224. Hence the price is \$2.24 per pound.) Other times, I prefer a calculator. It's quick and easy to use. If I have a lot of calculations to do, I look for a computer program or, sometimes, write my own. In an in-

EUGENE MAIER is president of the Math Learning Center in Salem, Oregon, and a visiting professor at Portland State University. He writes and speaks frequently on the subject of mathematics education. He is the father of four and grandfather of three.



structional setting where I am interested in portraying mathematical processes, I compute with wooden blocks or other physical objects. And sometimes I use paper and pencil—although they have no particular advantage as computational tools besides the familiarity that comes from being schooled in them. (Had I gone to school in some Eastern countries, I would reach for an abacus rather than paper and pencil to help do my computations.)

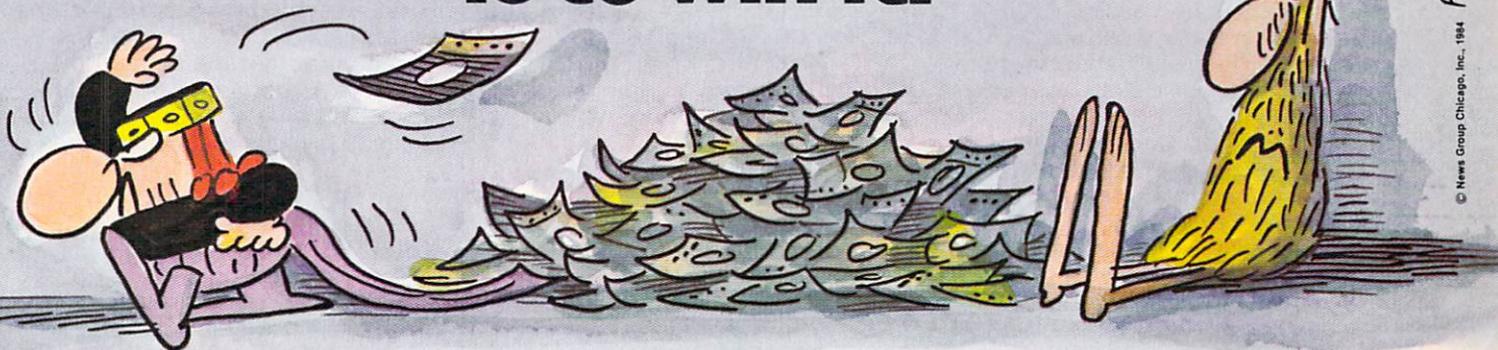
My point is that paper-and-pencil procedures are of no help conceptually. And, as only one of many options, they can be avoided computationally. Thus, I argue, the ability to

compute using paper and pencil is not a basic mathematical skill. It may be a useful skill, but it certainly is not a basic one.

The National Council of Supervisors of Mathematics identifies 10 basic skill areas in mathematics: problem solving; applying mathematics to everyday situations; alertness to the reasonableness of results; estimation and approximation; appropriate computational skills; geometry; measurement; reading, interpreting, and constructing tables, charts, and graphs; using mathematics to predict; and computer literacy.

The mistaken identification of pa-

One sure way to lose a game forever is to win it.



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We admit it. **WizType™** will teach you to type. From 20 to 120 words a minute, you choose! Now, isn't that what you need to operate your computer **fastfastfast**?

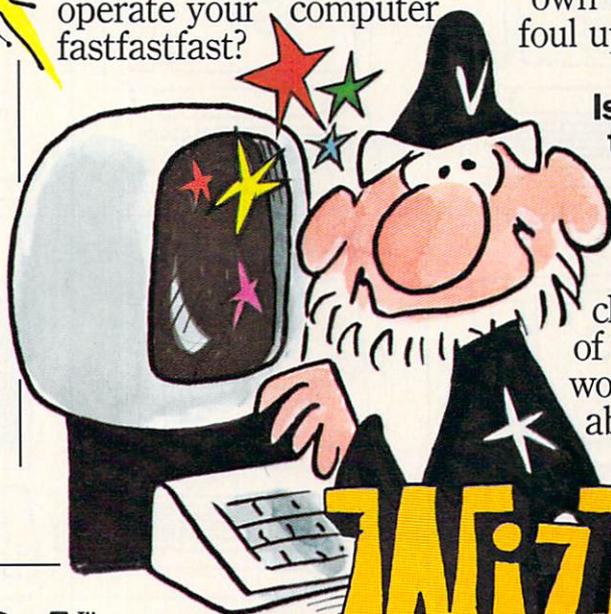
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ON-LINE

per-and-pencil computations with basic mathematical skills has adversely affected mathematics education and the use of calculators and computers in school. In an attempt to emphasize basic skills, the mathematics curriculum has focused on drilling students in mechanical paper-and-pencil procedures—procedures that are best performed by machines. The results are unfortunate. Genuine basic skills are not being taught.

And calculators and computers are being ignored—or even outlawed—as computational tools. They are being used in roles that subordinate them to paper and pencil. One finds calculators being used to check answers arrived at by paper-and-pencil methods and computers being used to produce electronic drill sheets for mastering paper-and-pencil arithmetic. These uses, it seems to me, are impoverished and inappropriate for such powerful machines.

We should recognize that paper and pencil, as computational tools,

are being outmoded. They are being replaced by other marvelous and more powerful tools. This is happening throughout the adult world—at financial agencies, accounting firms, engineering laboratories, marketplaces, educational institutions, homes, and wherever else computations are performed. I suggest that we allow this to happen in the child's world also. Computers and calculators should become the primary computational tools in our schools.

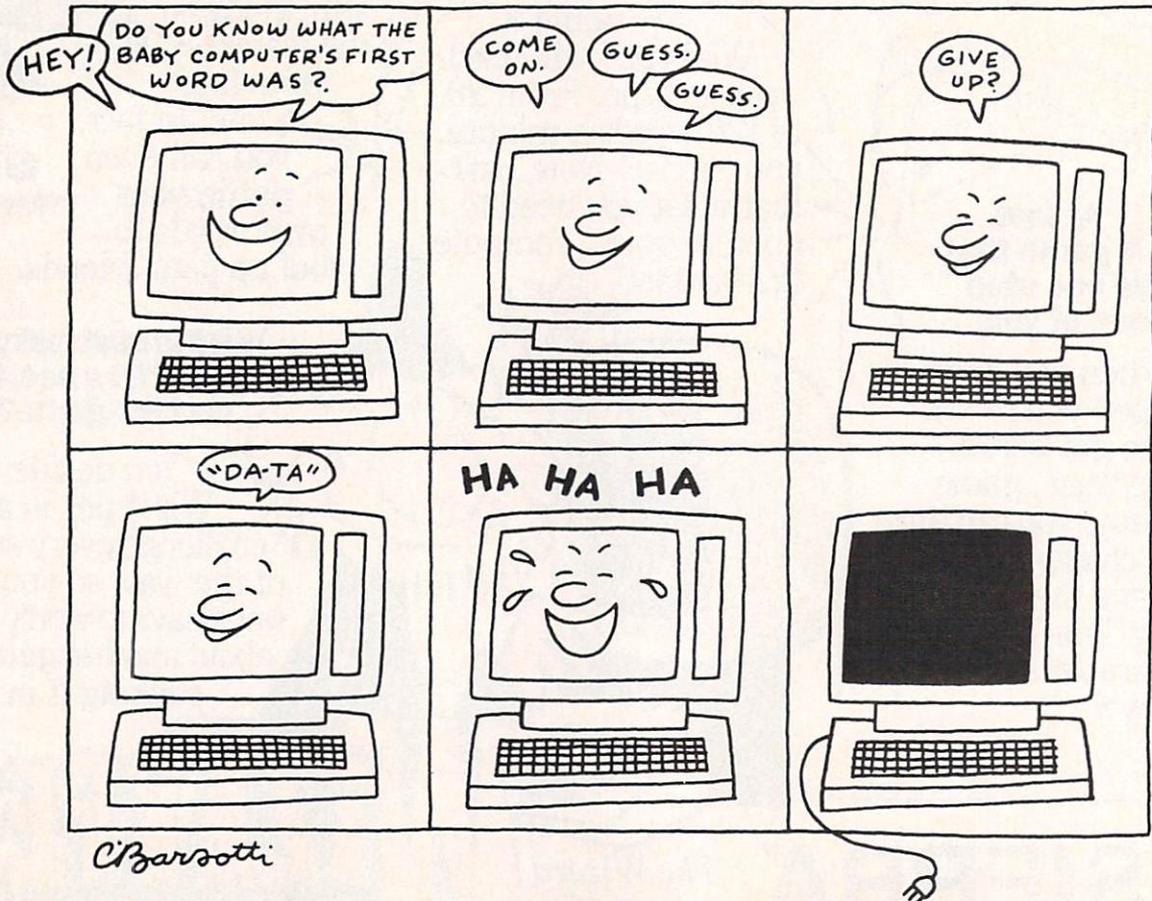
I am enthused about the prospect of such a curriculum. It offers tremendous freedom and opportunity. It removes school mathematics from the tyranny of hours of drilling to master mechanical mathematical processes that are rarely used outside of school. It gives us the freedom to focus on more important matters, such as the development of mathematical insight and intuition, the teaching of problem solving, and other truly basic skills. It places tremendous computational power at

students' fingertips, so that statistical and other applications of mathematics no longer need to be avoided because they exceed the computational capabilities of student and teacher alike. In such a curriculum, paper-and-pencil computing processes might still be taught, but as a matter of secondary importance, and not as a major theme.

I recognize that the thought of such a curriculum may be disturbing. It confronts our past. We are familiar with paper-and-pencil procedures—that's what we learned in school. And that's what we tend to think math is all about.

But I think it's time—and I hope you do, too—to encourage our schools to take advantage of the opportunity to leave mechanical mathematical processes to machines, and concentrate on developing mathematical insight and intuition. This will do more to help our children become effective students and users of mathematics than will any amount of paper-and-pencil drilling. **FC**

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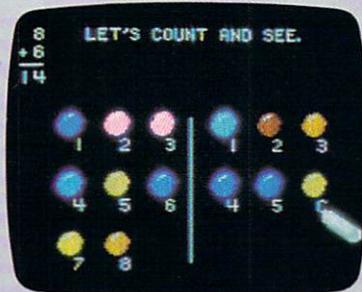
After an incorrect answer our professor uses chalk and a blackboard to work the problem through.

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Actual photographs from Commodore 64.

LIGHT TOUCH

PARADISE LOST

BY J.D. SIDLEY

I am a computer widow.

It all began last Christmas when my husband bought himself . . . one of those things. You know the kind I mean. When Adam and Eve ate one, they said good-bye to paradise forever. When my husband bought one, we said good-bye to our little paradise, too.

Mind you, I am not against technology across the board. I mean, automobiles and washing machines are fine. It's just that I feel a sense of loss, of an era gone by.

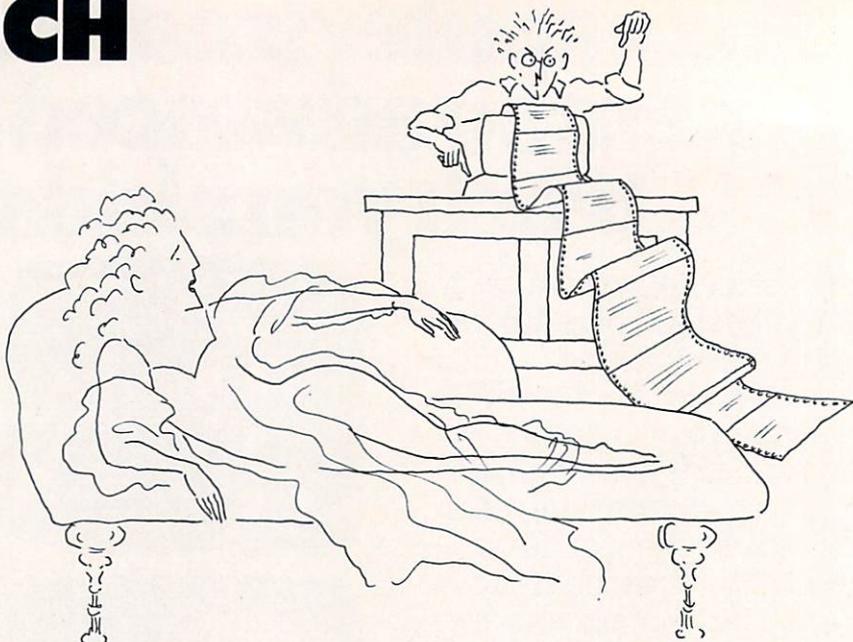
Maybe I'm suffering the pangs of future shock. I can remember a time when my husband—before he was my husband—would scribble a sonnet to me on a sheet of three-ring binder paper. There it would be, with its misspellings and crossovers and smudges. But it . . . it would have a personality. It would have a feel to it. It would make me cry. Today, he gives me the grocery list from a dot-matrix printer, sequentially paginated with justified right and left columns. Bye-bye romance—hello, floppy disk.

Romance. That's the problem with computers. And, I feel, the problem computers are causing in the homes of joint tax preparers all across America. I mean, these machines are just too cold. To me, having a home computer is about as romantic as receiving a toaster oven for a wedding anniversary present. Oh, give me something useless like a garnet ring or a pink negligee or a single red rose.

Practical. That's what computers are. But marriages are not built on practicality. They're built on love. Let's face it, marriage isn't practical at all. What's practical is staying at home with your parents for your whole life. That's practical, but even less romantic than toaster ovens.

My husband keeps telling me the computer is "friendly" and that I will learn to like it once I get to know it.

J.D. SIDLEY works as a public relations writer for the University Hospitals of Cleveland (Ohio) by day, and in the evening as a science-fiction author, professional gag writer, and composer of numerous love sonnets. J.D.'s favorite sonnet line is Shakespeare's "My mistress' eyes are nothing like the sun."



That sounds like a line he would use if he brought home some 19-year-old secretary from the office.

Do I sound jealous? Maybe I am, but listen to this. In the good old days, we would both come home from work and chat about our day. Now I'm working at the place he comes home to. You see, my career has taken a detour through Babyland, U.S.A. I have the entire Sesame Street record album collection and my Mr. Rogers fan club card to prove it.

When he asks me about my day, I inform him of his offspring's newest word, usually picked up from mom after she burned her hand heating up a can of Spaghetti-O's. Then I ask him about his day. And he'll describe something about improving his data-base access by hooking into the mainframe down at the office, and I'll wonder if that is at all painful or will in any way affect his conubial performance.

We are traveling in different directions on parallel roads. I mean, Mr. Rogers and mainframes just don't mix, not even in the Land of Make-Believe. Instead of spending our evenings shooting glances at each other, these days I conduct classes in the ladylike art of Going To The Potty 101, while he descends to the basement to compute.

Oh boot! You tell me that this silent machine isn't to blame for the growing rift in our relationship? Well, I'll tell you, it ain't helping, sister.

Why, one night last week after the kids had gone to bed early (I had made them run laps around the living room), I thought maybe, you

know, we could rekindle a little romance. I donned an absolutely embarrassing nightgown, turned off most of the lights in the house, and put a little Chopin on the stereo. Then I alluringly approached my husband . . . and he mumbled something about being behind in his *VisiCalc*.

Sometimes I feel like a tourist in the Land of Strange-Speaking Computer People. I feel I should be looking up words in a pocket dictionary. "No hablo *VisiCalc*, Señor."

What happened? When I came back a little later, he was madly engrossed in defending an alien invasion on his little television screen. *VisiCalc*, my joystick, buster!

It used to be—they said—that kids pulled a marriage apart. Not so. It's not the kids. It's that . . . thing!

"Come on, try it," he says. "You can use the word processor." No. The only thing I want to see on a television screen is the guy who plays Remington Steele.

A computer has come between me and the man I love.

Yet, just yesterday, as I sat reading, I found a green and white sheet of computer paper folded in my book. Properly centered between the rows of printer holes on each side, was a sonnet that ended with the following heroic couplet:

No matter what word processors can do

My inspiration will always be you.

OK, so maybe I've leaned a little hard on my husband and his machine. I guess, well . . . I guess I can get used to it. All it needs is a little romance. **FC**

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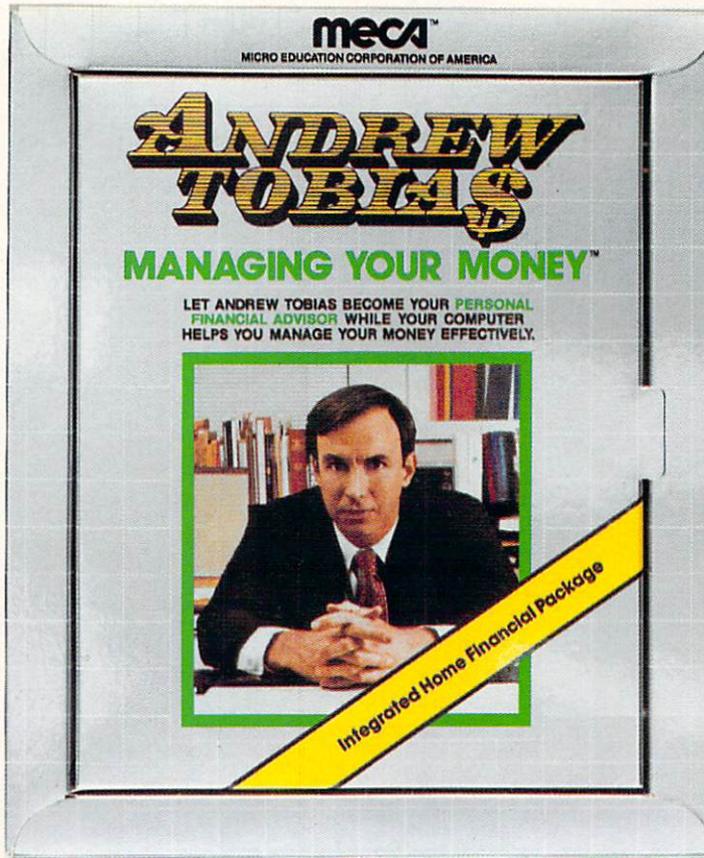
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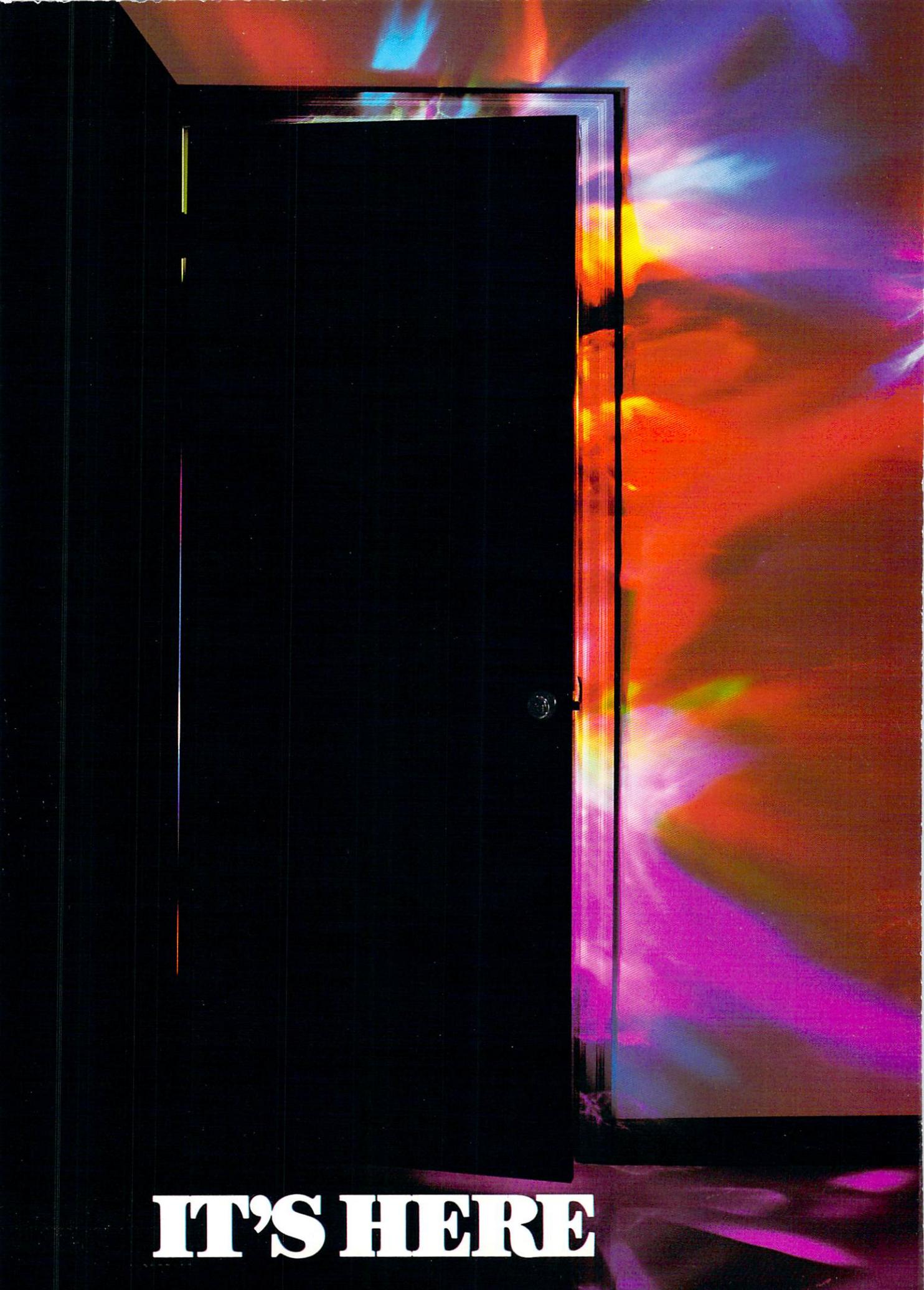
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"Goliath Slavered On Daddy's Investment Floppies."



IT'S HERE

COOL

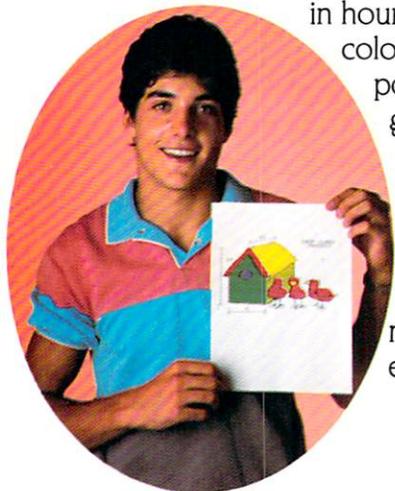
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color gives you the opportunity to print graphs, charts and pictures from popular graphics and drawing programs. OKIMATE 10's brilliant color means you'll shine, every time.



OKIMATE 10 feels right at home. Anywhere.

A special PLUG 'N PRINT™ package lets you plug your new OKIMATE 10 into your Atari or Commodore computer. And print. It's that easy. In minutes you'll be printing everything from soufflé recipes to needlepoint patterns. Party invitations to kitchen inventory. Love letters to gardening directions. At 240 remarkable words per minute. And not just in black and white, but in over 26 brilliant colors!

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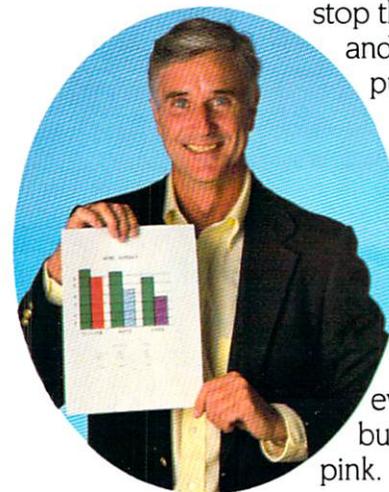
If you use your personal computer to keep track of mortgage payments, tuition payments, balance your checkbook or jump ahead of the Dow Jones', there's good news for you. You'll find that the new OKIMATE 10 gets down to business quickly. And easily.

A "Learn-to-Print" diskette and tape shows you how to set up your new personal color printer and start printing. A complete OKIMATE 10 Handbook will show you how you can take your imagination to places it's never been before.

WORLD

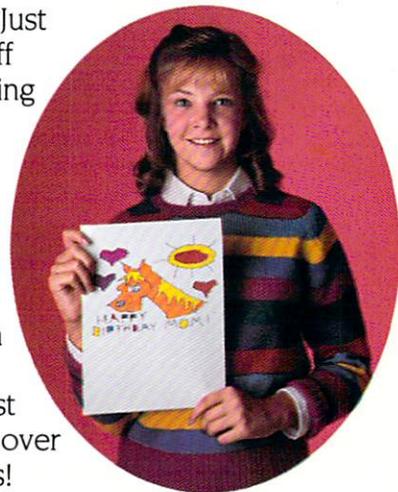
PERSONAL COLOR PRINTER UNDER \$250.

And while your imagination is soaring, you'll be glad to know that your new printer can keep right up with it! The new OKIMATE 10 is built with the same tradition of quality and manufacturing excellence that has made Okidata the most respected name in computer printers. Okidata craftsmen specially designed and engineered the new OKIMATE 10 to be incredibly small and lightweight. And they made it quiet as a whisper. But their imagination didn't stop there. To help you



and your personal computer keep within your personal budget, they made the OKIMATE 10 available at retailers everywhere for less than \$250. Something that should make every personal budget tickled pink.

patible with a variety of software packages that will run on your Atari and Commodore with a simple disk drive. Just load and you're off and running. Plotting charts. Designing special graphs. Creating original illustrations and pictures. Drawing special graphics. And printing them all beautifully for everyone. On most kinds of paper. In over 26 beautiful colors!



Color your world.

If you've been playing games on your personal computer, now you can get serious and still have fun. The new OKIMATE 10 is completely com-



QUESTIONS & ANSWERS

Q: Why do I need a printer?

A: You might as well ask, "Why do I need crayons?" When it comes to communicating, "putting it on paper" is still the best way to get your message across. You can have lots of computer equipment, but without the OKIMATE 10, it doesn't mean very much. Unless you get your letter, report, term paper or party invitation off the screen and down on paper, nobody's going to see it.

Q: What makes the OKIMATE 10 better than any other printer?

A: Because the OKIMATE 10 is unlike any other printer. First, it prints in COLOR. Up to 26 beautiful colors. Second, it prints up to 240 words a minute, so quietly you can talk in a whisper right next to it and still hear every word! And third, it prints letter quality, every time.

Q: What about graphics and pictures?

A: The OKIMATE 10 does it all. Graphs, charts, symbols, pictures, illustrations, and special drawings! With a compatible drawing package, anything you create on your screen can be printed in full color; a disk drive is required for color screen printing.

Q: What kind of paper can I use?

A: Just about any kind of smooth paper you want. From continuous feed computer paper to single sheets. From mailing labels to plastic acetate for overhead transparencies, the OKIMATE 10 prints crisp, clean, colorful images you'll be proud to send to friends, teachers, business associates, or frame and hang right in your own living room!

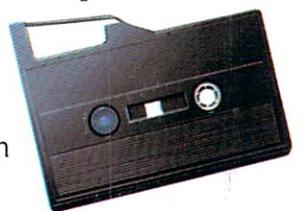


Q: Is the OKIMATE 10 easy to use?

A: As easy as "PLUG 'N PRINT!" No other printer is easier to use than the OKIMATE 10. Connecting the printer to your Commodore or Atari computer is, literally, a snap. The exclusive PLUG 'N PRINT package snaps into the printer. One cable connects it directly to your computer or disk/tape drive. Turn it on and you're in business. Once your OKIMATE 10 is up and running, the "Learn-to-Print" software program (included) teaches you printer basics—the "Color Screen Print" disk (also included) automatically prints everything on the screen in a single stroke. As a matter of fact, most of your printing can be done with just one command.

Q: What's the printer like in operation?

A: In one word: easy! Incredibly easy! The ribbon comes in a "Clean Hands" cartridge. So it's as easy to change as the tape in your audio cassette player.

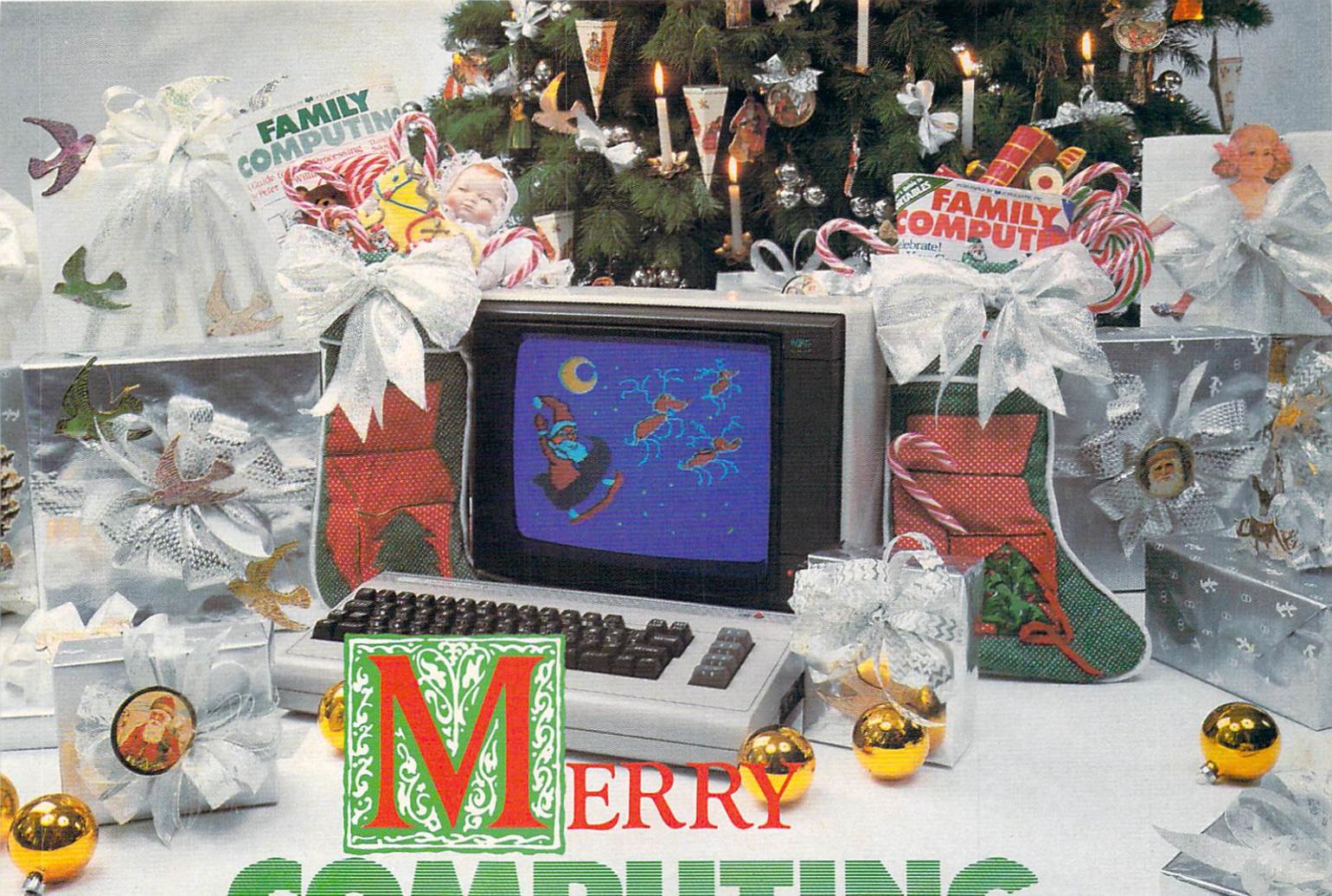


Q: What about reliability?

A: Okidata has built the reputation of its complete line of printers on quality, dependability and rugged construction. The OKIMATE 10 is no exception. Don't let its light weight and compact size fool you. This printer is not a toy. It's a workhorse.

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A **TERRIFIC GIFT BARGAIN**. Your first one-year gift is just \$19.97 — 33% off the cover price. Each additional

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COMPUTING CLINIC

SINGLE- AND DOUBLE-SIDED DISKS • HOT COCO • CARTRIDGES VERSUS DISKS FOR KIDS • HI-RES GRAPHICS

BY JEFFREY BAIRSTOW

Will a single-sided disk converted into a double-sided disk hurt the computer, the disk drive, or the disk?

CHUNG CHOI

Yorba Linda, California

I assume you are trying to use both sides of a floppy disk in a computer that has a single-sided disk drive. The second side of a single-sided disk can be used by cutting a new write-protect notch (the small rectangular notch in the side of the disk jacket) and an index hole (the little hole just off center), and flipping the disk over in the drive. This transformation won't hurt the computer or the disk drive, but may damage the disk. It's recommended only as a measure of last resort, or for backups. Single-sided disks are guaranteed to work on only one side; the other side may contain defects that make it impossible to use.

You can also use a single-sided disk in a double-sided drive (such as on the IBM PCjr) without harming anything. But, again, the results may be "iffy."

The top of my TRS-80 Color Computer and my Coleco ADAM printer both get hot after a short time of computing. Will this damage anything?

STEVE BLUM

Quartz Hill, California

Most computers do generate some heat in normal operation and are designed to operate this way. A Radio Shack technician suggests, though, that you point a small fan toward the computer's power supply if you notice overheating. It's very important not to cover up any vents on the computer or to pile books or papers on top of the machine. If air cannot circulate around the components inside, heat will build up and could burn out some of your com-

JEFFREY BAIRSTOW, a technical journalist who lives in West Redding, Connecticut, was a founder and managing editor of Computer Decisions magazine. He has also taught math and computer science in England. His family, including two preschoolers, uses a variety of computers.

puter's RAM, according to Radio Shack.

When buying games and educational software for young children, what are the advantages and disadvantages of disks and cartridges?

ROBERT J. BOROUGHS

Reno, Nevada

In our family, we have a 3-year-old and a 5-year-old who use computers, so my comments are based on their experiences. Both girls prefer to use cartridges because they can insert them directly into the computer (a TI-99/4A) without adult help, and the cartridges are self-loading so the programs can be started easily.

Our older daughter also knows how to use a disk-based computer and can read and type sufficiently well to start a program by herself. Nonetheless, she prefers the cartridges because "they don't mess up." That's to say, errors in typing cause fewer problems. We've never lost a cartridge but we have had disks damaged both electronically and physically.

The major disadvantage to cartridges is that you cannot store data on them, though some cartridge programs allow you to save to cassette or disk.

In all, I'd say that cartridges are distinctly preferable for younger children. The quality of the programs is comparable to disk-based software.

Where do programmers get the "I," "J," "K," etc. in statements like: FOR I=1 TO 1000: NEXT I?

SARAH JONES

Kankakee, Illinois

This pair of statements is simply a delay loop that makes the computer count from 1 to 1,000 before going on to the next instruction. "I" is a variable with a beginning value of 1. The NEXT instruction causes "I" to be increased from 1 to 2, and so on. The proper name for this is a FOR . . . NEXT loop, which allows a programmer to specify how many times a series of instructions should be repeated.

The choice of counter ("I" in this case) is often quite arbitrary, so any letter of the alphabet could be used unless that letter is already in use somewhere else in the program.

How can I use high-resolution graphics on a Commodore 64?

DARRELL STRICKLAND

Maxton, North Carolina

The Commodore 64 is well-suited to graphics displays. You can use the extended character set that includes built-in graphics characters (the shapes and symbols printed on the front of the keys). For more complex graphics, you can write programs that actually manipulate individual dots on the display screen. This is called "bit-mapped" graphics. And, you can write programs that manipulate sprites.

The extended character set graphics are described in the Commodore 64 manuals, but bit-mapped graphics and sprite manipulation are considerably more difficult. The subject is too complex to go into here; I recommend you read the excellent graphics chapter in *Your Commodore 64*, by John Heilborn and Ron Talbott (Osborne/McGraw-Hill, Berkeley, CA; \$14.95).

What binary digits (0s and 1s) represent the characters A-Z and 0-9?

DAVID YEE

Cambridge, Massachusetts

Many books on computer programming list the two most widely used binary representations of letters and digits. The two character sets are ASCII (American Standard Code for Information Interchange) and EBCDIC (Extended Binary Coded Decimal Interchange Code).

Most personal computers use a form of ASCII. EBCDIC is used mainly on IBM mini and mainframe computers. You'll find a full description and listing of both codes in *Webster's NewWorld Dictionary of Computer Terms*, Simon and Schuster (New York), \$5.95. And most microcomputer manuals list that computer's particular ASCII code.



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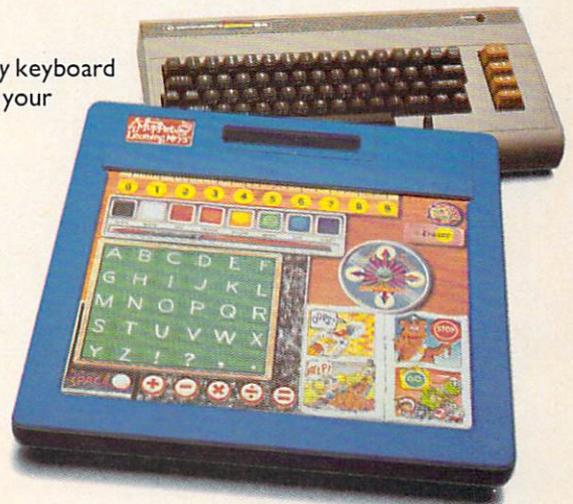
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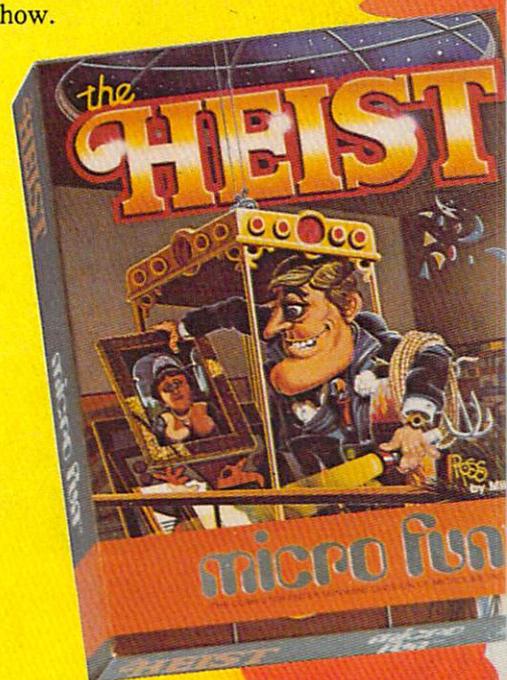
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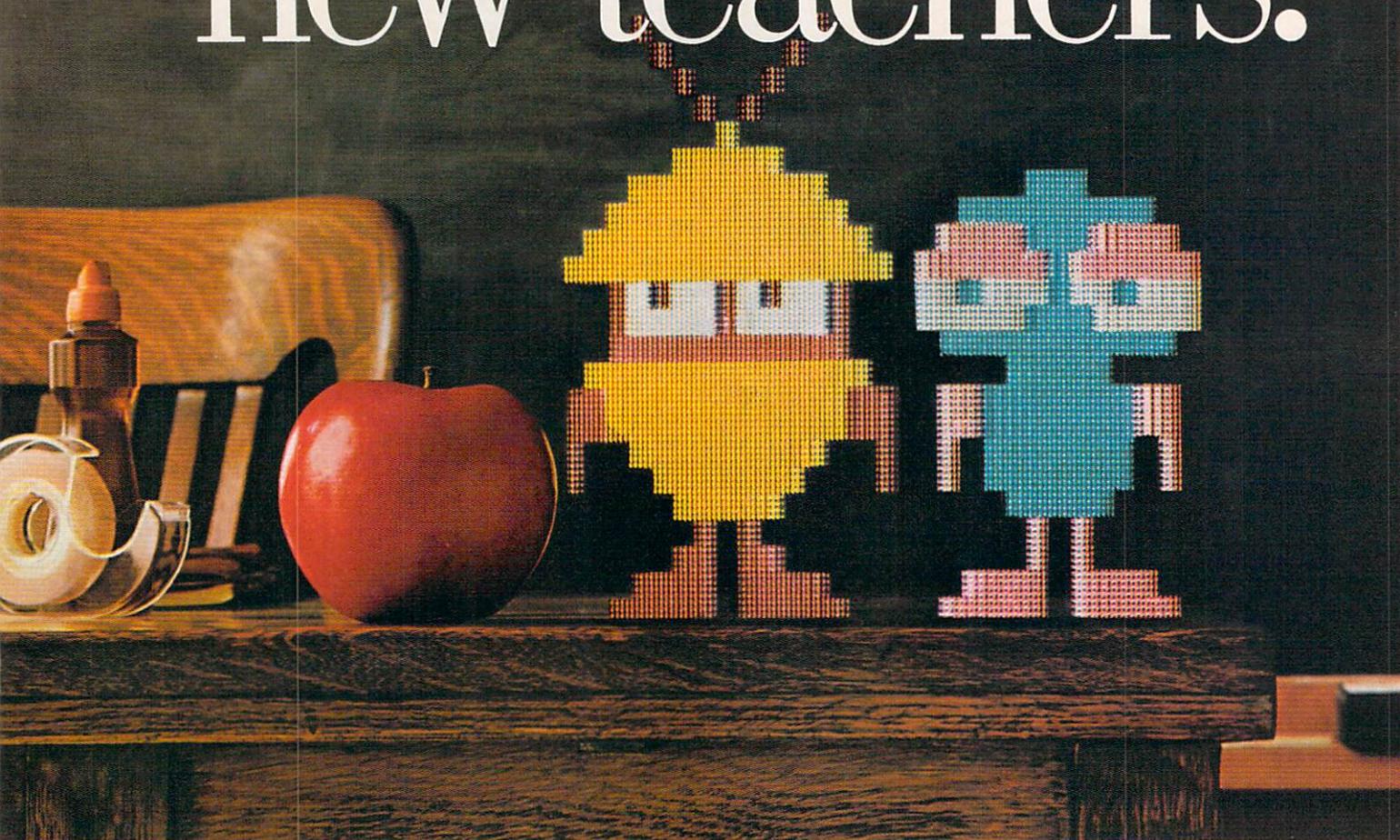
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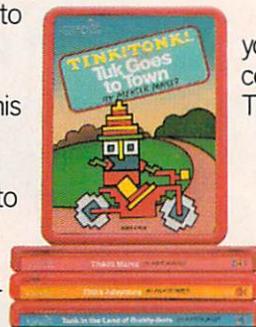
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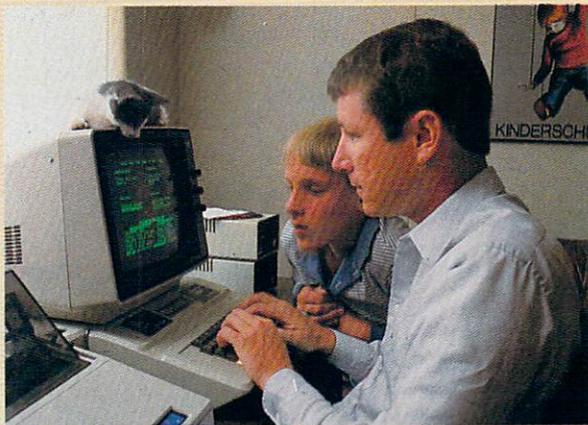
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Instead of wear out.

Life with Bachelor Father and His Computer

HOUSEHOLD CHORES FOR ONE ARE EASILY MANAGED; ADD TWO SONS AND TIME IS AT A PREMIUM. HERE'S HOW THE COMPUTER HELPS.

BY JON PATRICK HARPER



FAMILY COMPUTING recently received the following letter in the mail: "I am hoping you will consider writing a story about my son's high-school teacher, who, as a single parent of two teenage boys, uses his computer to help save time and energy after work. Mr. Harper is teaching at Don Bosco Technical Institute in Rosemead, California, raising two boys, driving 100 miles a day, studying for his master's, and performing all the duties of a mom and dad.

"As a working mother of four, I am very interested in how he has time for anything else besides teaching. Several of us mothers have talked to him and are envious of his skill and expertise in not wasting valuable time at home and that has prompted this letter to you. We were hoping you would write a story about this remarkable person so we could find out just how he uses his computer to simplify his life. He says he has everything on the computer from 30-minute meals for dinner, chores for the boys (which change weekly), to a printout sheet of his grocery list printed out in the order in which items appear in the aisles of his market.

"I hope you'll consider this a worthwhile story; so many of us waste our valuable time off running around needlessly in hopes of saving a dollar, only to return home tired, crabby, and still without an inkling of what to serve for dinner!

"Sincerely, Joann Komin, San Gabriel, California."

We called Mr. Harper, and asked him to tell us his story. Here is what he wrote . . .

Not too very long ago, I was a typical bachelor. Budgeting? I didn't know what the word meant. Why should I? I was a single man with a single checkbook, and if that was accurate within a few bucks either way, I was in good shape. My apartment was small and easily kept clean. Not orderly, but clean. I knew where everything was amidst the chaos. Laundry? No problem. I just let it pile up until it was almost hopeless. In a pinch I could buy something new (I had 5,000 pairs of socks).

And then, in 1977, I adopted two sons. The world suddenly became a more complicated place. The boys didn't just triple my work load, they increased it by a factor of nine. Or 10.

I'm often asked why I decided to adopt two older kids (we've been approved for number three). Why, I'm asked, did a (now) 31-year-old bachelor decide to adopt? There is no simple answer, although I can tell you precisely when I decided to adopt.

THE DECISION TO ADOPT

In 1973, just before I turned 20, I decided to combine my undergraduate German and psychology majors into something practical by working as a psychological caseworker in the beautiful Northern German city of Celle. While I was on the staff of an orphanage there, I saw a young boy accidentally struck by a staff member who was attempting to pull apart two fighting kids. The boy's name was Gerhard, and he was 12. He had been very badly abused before the state had removed him from his parents' control, and he hadn't spoken a word to anyone since. Of all the kids I could name who should never get hit, Gerhard was No. 1. He turned and fled.

After quiet was restored, I went looking for the boy. He had gone to his room, drawn the curtains closed, lain down on the bed, and pulled himself into a fetal position. He lay there with his thumb in his mouth and tears rolling softly down his cheeks. I could feel his pain and sense of betrayal. The staff member, who was

there to guarantee the justice he so desperately needed, had betrayed his trust, accident or not. For 20 minutes I talked with Gerhard, explaining that it was an accident, but I could get no response.

Five minutes later, as I stood in front of the window overlooking the grounds wondering what else I could do, I heard footsteps behind me. I felt a little hand slide into mine and pull me around. Gerhard looked up at me shyly, and said, "Danke." From that moment on he began opening up and I knew then that I was going to adopt kids.

After I finished my degree work in 1977, I returned home and started teaching at St. John Bosco High School in Bellflower, California, my alma mater. A month after my return, I applied to the Los Angeles County Department of Adoptions for my first son.

Now I have two boys of my own. Richie will be 16 come Dec. 7, Pearl Harbor Day. I often joke with him about his birthday being apropos: He's forever going off like a bomb! Richie is gregarious, outgoing, and brave. To this day, I do not understand why he was rejected at age 10 by an abusive mother.

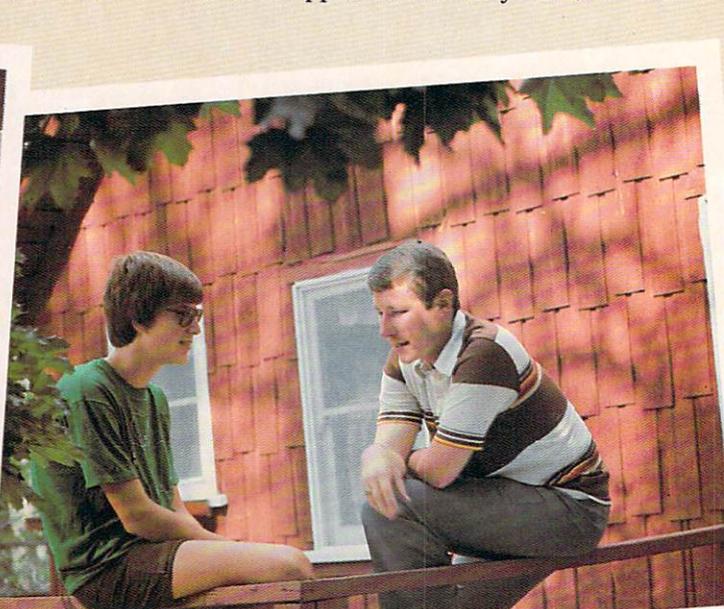
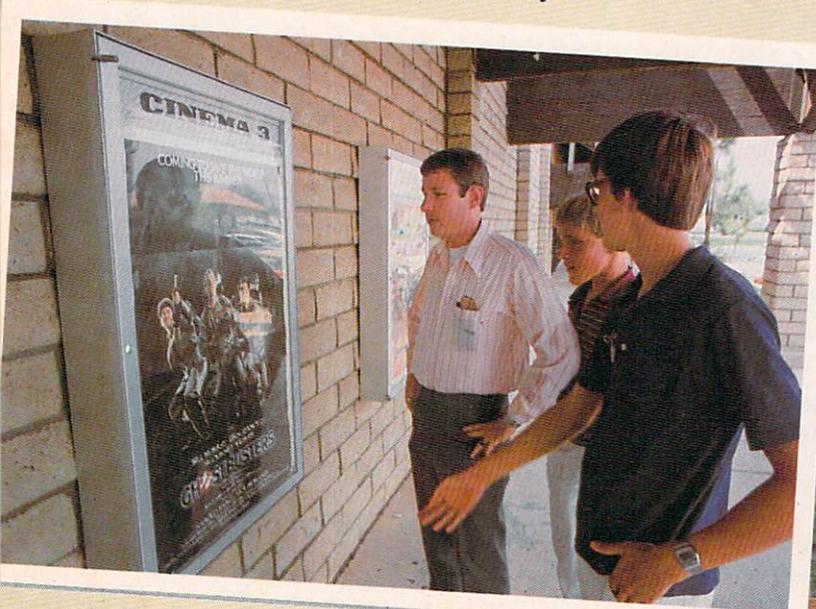
Patrick, 16, is the quiet, scholarly one. His interests range from arithmetic to the seven books of magic, and often at dinner we'll discuss everything from theater to quantum mechanics. Pat had been in 11 foster homes before he was entrusted to me.

LIFE BECOMES MORE COMPLICATED

With the boys' arrival, I not only had to remember my own errands, but Boy Scouts, doctor appointments, and meetings with the social worker, too. The occasional note stuck up on the refrigerator door became a flurry of paper. In fact, the refrigerator door disappeared beneath notices about school holidays and P.T.A. meetings. I bought one pocket calendar, then two. That didn't work. The one I needed was always somewhere else.

Time disappeared. Laundry—Oh, curse of

Thanks to the computer, Jon Harper now has three free weekends a month to spend with his sons—going to movies and having heart-to-heart talks.



the living! It had to be done often, for active boys change clothes more frequently than a fashion model. It seemed like I was spending every evening doing laundry, and we were still wearing our cleanest dirty clothes!

This was not why I adopted kids. I wanted to spend quality time with them while we were all still young enough to enjoy it. I shuddered at the thought that I might fritter away these precious years doing menial but necessary tasks and one day regret it. I had to get control of the scheduling, budgeting, and correspondence. And, I had an idea of how to do it. I promptly went out and bought the wrong computer. The year was 1979.

I knew what computers could do, but not how they do it. I knew nothing about programming, and still don't know too much. I'm not interested in reinventing the wheel; canned software suits me just fine. I went to an electronics store that sold computers on the side, and was sold a computer with 4K memory and a cassette recorder. I also bought a checkbook program on cassette.

The program was excruciatingly slow, extremely limited, and highly efficient. Instead of spending two hours at the end of the month reconciling my checkbook, it took me seven minutes. I had gained an hour and 53 minutes a month to spend with my sons! My head reeling with success, I gave the small computer to the boys (Patrick promptly disassembled it to see how it worked), and approached the whole thing with a bit more *savoir faire* as a result of my mistakes.

HOW I CHOSE MY SECOND COMPUTER

First I made a list of everything I wanted my computer to be able to do—based on what I'd read computers could do. I concluded that I would most likely be working with words (for word processing), pictures (for graphing), and relatively small numbers (for household accounting). That helped me narrow the selection.

Then I read every magazine with information about computer software, and I mean *every* one. I didn't worry about the technical stuff. I mostly scanned the promotional material to see which computers were best for what.

Next, I visited stores that specialized in software, not hardware. I asked the salespeople which computer they'd recommend to do the tasks I wanted. Eventually, I found a salesman I trusted, and since I bought the system he recommended, I've continued to buy all my software from him.

I started off with an Apple II plus with 48K memory and a single disk drive in March 1981. I soon expanded it to 64K, added a second disk drive, and purchased a dot-matrix printer. A letter-quality printer followed later.

When I got my computer home, I set aside an area that had some work space around it, and room for peripherals later. I knew that if I didn't allot my computer its own space I'd end

HOW I SELECTED MY COMPUTER

1. First, I sat down with a stack of blank paper. On the first sheet, I listed every room in the house and next to each room put a consecutive number.

2. Then I took another sheet of paper, and, looking at the room listed as No. 1, wrote every task performed there that I could think of. After I had run dry, I went on to room No. 2 on another sheet of paper, until I'd finished the whole house (including the garage and the yard).

3. Next, I grouped the similar tasks of each room under a letter heading (A,B,C,etc.). For example, in the kitchen, "menu planning," "cooking," and "baking apples" were all classified as "A" since they involved food. "Dishes," "floors," and "trash" all went under "B", since they involved kitchen chores. I did that for the rest of the rooms. Since I pay bills and balance my checkbook in the dining room, I classified those activities there.

4. When I thought I had everything classified, I asked Richie and Patrick if they could think of anything to add. They thought of some things I hadn't and I put their answers under the headings where they belonged.

5. Next I went through the list and put a big check next to all of the tasks that required planning, organization, or decision-making. It wasn't surprising to see that involved almost all of them. Next to those tasks I wrote an estimate of how much time they required over the span of a month.

6. Then I read the software reviews and advertisements in every computer magazine I could find, and tried to match my tasks with specific programs. I bought my Apple II plus because it had the greatest percentage of the software I could see myself using.

7. The next step was to choose the task I most wanted to master and to buy the software that would do it. That happened to be my checkbook. Budgeting came second. As I mastered my checkbook and budget, I added software (as my budget allowed) until I had the household under control. Now it's primarily a painless, often exciting process of fine-tuning a particular program. And the time it has saved me is spent with my growing sons.

up packing it away. And the whole point was to use it. I was right.

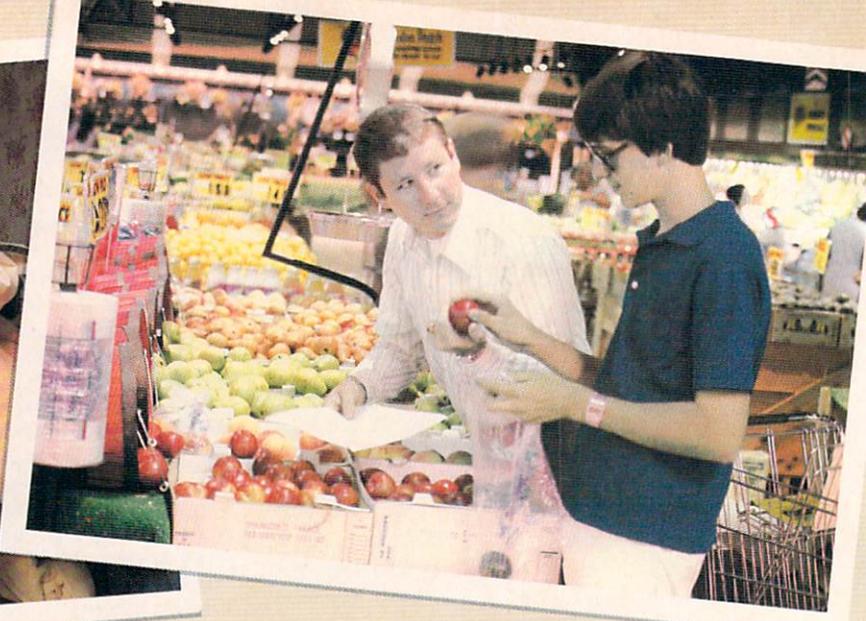
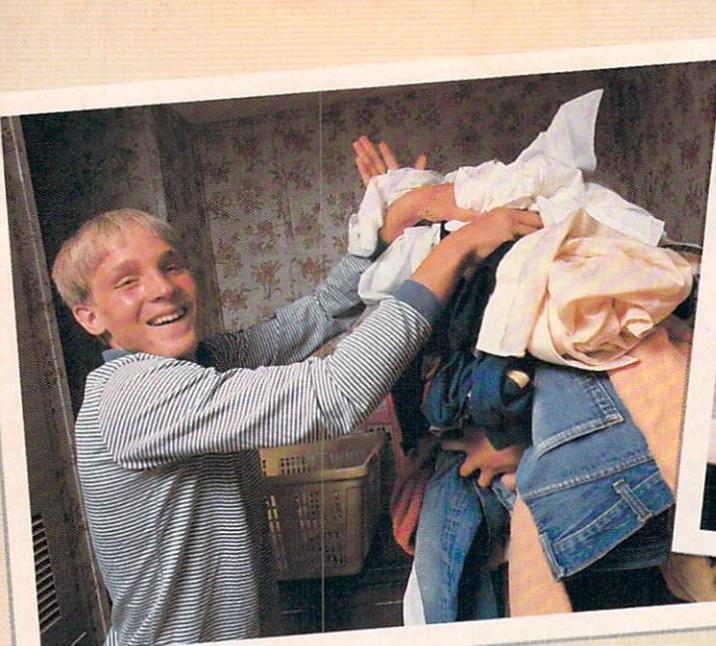
I started off with a single program that addressed my most pressing need: my checkbook. I stuck with that rascal until I had it down. (I've since gone on to a different program.) With that first success, I felt excitement as I began to regain control. While it wasn't an instantaneous process by any means, the boys began to sense the difference the computer was having on our lives. I started to have more and more free time to spend with them.

As I became ever more comfortable with the computer, I found myself asking, "I wonder if the computer could . . ." and had the good sense to follow up on this curiosity, because, more often than not, it could. And that's how I got to where I am.

Now, three years later, I use the computer

"I STARTED OFF WITH A SINGLE PROGRAM THAT ADDRESSED MY MOST PRESSING NEEDS."

JON PATRICK HARPER is now a dean and counselor at Don Bosco Technical Institute and is currently working on his master's in Marriage, Family, and Child Counseling. He lives in Sunnymead, California, with two adopted sons.



In the Harper household, Dad doesn't decide whose turn it is to do the laundry and the grocery shopping—the computer does.

about two hours and 15 minutes a week, just doing nuts-and-bolts-type stuff (menu planning, balancing my checkbook, etc.). I usually work on it after a leisurely breakfast on Saturday. Having a computer has given me about three free weekends a month, and that's time for the kids. Here's how the computer helps:

HOUSEHOLD CHORES

Before: With the boys' arrival, my life had become more home centered. Our house was often full of kids, for my sons' friends all felt welcome, and truly were. This was what having boys was all about. Nonetheless, it soon became obvious that more use meant more mess. Consider something as mundane as popcorn. Have you ever noticed that for every piece that reaches your mouth, three disappear into the carpet or slip between the sofa cushions? Boy! I did.

We decided on a team approach to the chores. Unfortunately, many times my fiat became the determiner of whose turn it was to vacuum, and some hard feelings resulted.

Now: I use the spreadsheet program, *VisiCalc*, to create weekly rotating, chore lists. Across the top of the spreadsheet I've entered the days of the week; down the left column the specific chores (DISHES, WINDOWS, etc.). The boys' names alternate under each day of the week for the daily chores, and rotate every other week on the weekly chores. All I have to do is input the date and select the week of chores I wish to print. Then I post the list on the refrigerator.

Benefits: This has saved me about an hour a week by the time you count in all the fights and battles: "But I did the windows last week, it's his turn!" The computer divides chores fairly and provides accountability.

MENU PLANNING

Before: When kids come home from school they attack the refrigerator like the Goths did Rome. You never know what's going to be left, so it's important to plan meals ahead

of time. But putting together a weekly menu was always a real chore, and our diet tended toward bachelor cuisine: Monday—peanut butter and crackers; Tuesday—peanut butter and chips; Wednesday—leftovers (peanut butter and fingers!).

Now: I pop the program *Kitchen Planner* into the computer and inform it I want to plan my family's meals for the next two weeks. A few seconds later a randomly generated menu with suggestions from different food groups comes up from a list of possibilities that came with the program, and some which I added myself. (For instance, my boys love eggs with mozzarella cheese, but hate green peas. So I instructed the program to have the former dish suggestion come up 30 times out of a 100, and the latter once every 2,300 times!)

Since at least one of us is always on a diet, I also use the program, *Dietician*. I enter the dish proposed by *Kitchen Planner* and *Dietician* informs me of its fat, carbohydrate, protein, sodium content, etc.

Recently I found myself faced with the gift of a refrigerator full of rutabagas. Since I don't own many cookbooks (I find them prohibitively expensive), I use the program *Micro/Cookbook*. I enter RUTABAGA and am given all the recipes that call for rutabagas (some came with the program, and some I've added myself).

Benefits: The computer saves me about five to six hours a month in the kitchen, since planning a menu takes time. Our meals have become more varied. Yet it's easy to allow for personal preference.

GROCERY SHOPPING

Before: I've always loathed grocery shopping. Once I got to the store there were endless searches through incomplete lists, and one result was a whole lot of impulse buying. So much for the budget!

Now: After I decide on my menu for the next two weeks with *Kitchen Planner*, I press a key, and the computer prints out a shopping

**"I FELT
EXCITEMENT
AS I BEGAN
TO REGAIN
CONTROL."**

list, with category groupings: meat products, fruits, vegetables, etc. When I got the program, I went to the local supermarket manager and asked him for a copy of his shelf layout plan. Then I altered the program so that the ingredients are on my list in the same order as they appear on the shelves. Now I just follow my shopping list from top to bottom.

Benefits: Where it used to take me two to two and a half hours to do one week's worth of grocery shopping (not to mention a trip to the store every other day for forgotten items), now I can do two week's worth of shopping in about 20 minutes, if the lines aren't too long.

BUDGET

Before: With the arrival of two sons, a million different unexpected but important items had to be budgeted for, ranging from shoes to baseball mitts, school clothes to Christmas gifts. To complicate matters, my income varies from school year to summer (when I work as a real-estate agent). This requires keeping separate records for tax purposes on such things as car use.

Now: I use *VisiCalc* for budgeting. First, I enter a month's net pay and expenses. (I list the actual amount when it's the same each month, such as car insurance. On the bills that vary, such as the telephone, I input an average from the last three months' costs.) Then I have the program subtract the monthly bills from my net pay. After I get up off the floor and regain my composure, I go back and start adjusting the amount that goes out in each pay period in order to eliminate the highs and lows in cash flow.

The day-to-day control of my budget is kept by my checkbook program, *Dollars and Sense*. I don't even bother to balance my checkbook on paper any more. At the press of a button my computer can do it for me! *Dollars and Sense* will also chart my budget on a household expense against what I'm actually spending.

I use *The Smart Checkbook* to print my checks (which saves me the time of making double entries: once on the check itself, and then in my checkbook). I also have the computer print the name and address of the recipient on the lower left-hand corner of the check, so I can pop the payment into a window envelope.

Benefits: "What if" changes are easy to make with a computer, and long-range budgeting (which I never used to do) is a breeze. I can update it in about 20 minutes every three months. And now, I can anticipate major expenses, such as the purchase of school clothes in September, and begin planning far in advance. And since I get paid by the school only 10 months out of the year, it's easy to distribute my income over 12 months, in the event that I don't work over the summer.

In addition to the time *Dollars and Sense* saves me each month in balancing my checkbook, it saves me three extra days around tax time of going back over a year's worth of ex-

penses. Now I just have my computer print out a list of all my checks under different categories, hand the lists over to my accountant, and go sailing.

BANKING

Before: Getting to my branch of Bank of America is a 20-mile trip along country roads. It can take up to 90 minutes, and since the bank opens at 10 a.m. and closes at 4 p.m., I found it nearly impossible to fit my banking in around my 8 to 5 working schedule. Add to that the time wasted in long bank lines.

Now: I do a lot of my transactions from my living room, using my Hayes Micromodem IIe. All I do is put my communications software disk into my drive, instruct my modem to call the bank, input my identification number and password, and I'm right in the bank (with nobody in line ahead of me)! Using the modem, I can write and send checks, transfer money from one account to another, and, among other things, see which checks have cleared without having to wait until the end of the month. There is also on-line assistance available from a teller, 24 hours a day.

Benefits: Not only do I save gas, but I can bank at my convenience rather than at the bank's. Now I do most of my banking on Saturday, or after 11 p.m. on weeknights. (And I think bank tellers act much more human over the computer than in person!)

GIFT SHOPPING

Before: Every Christmas, my bill at McDonald's looked like the national debt, since I supplied the boys with food money while I shopped for their gifts. By the time I completed my list, the last thing I wanted to do was see another human being.

Now: I subscribe to CompuServe, and come November, I just hook up to the national network with my modem, and shop on-line. (FAMILY COMPUTING featured this service, *Comp-U-Store*, in "A No-Hassle Way to Shop" in the December 1983 issue.) The gifts are delivered to my home, so all I have to do is go into my bedroom and wrap them!

Benefits: I can do my Christmas shopping in about 10 minutes. But the real savings is my peace of mind. Since I've been shopping on-line, I've found myself enjoying Christmas with the boys a whole lot more because I'm not exhausted from competing with crowds.

CORRESPONDENCE

Before: My correspondence increased substantially with the boys' arrival. Often I'd have to make duplicate copies of letters to relatives announcing, "We've grown by one! Born 1967; arrived 1978!" or of letters to the Department of Adoptions and schools.

Now: I use the word-processing program *PowerText*. I've set up formats for business and personal correspondence, memos, invitations, journal keeping, my master's thesis, etc.

**"THE BOYS
BEGAN TO SENSE
THE DIFFERENCE
THE COMPUTER
WAS MAKING
ON OUR LIVES."**

HOW I MANAGE— AT A GLANCE

Here are the programs I use on my Apple II plus to run my household. There are many similar programs on the market, so shop around first to find the ones that not only work on your computer, but are right for you. (*Before you start, you might want to read the software reviews in back issues of FAMILY COMPUTING.*)

PROGRAM	USE	BENEFIT
VisiCalc , available for Apple II plus/IIe/III, 64K; Atari 800, 32K; IBM PC/PCjr, 64K; TRS-80 Models II/4, 64K; III, 48K. (TRS-80 version marketed through Tandy/Radio Shack; Apple III version marketed through Apple; Atari version marketed through Atari.) \$250 (Apple II); \$99 (IBM). VisiCorp, 2895 Zanker Road, San Jose, CA 95134; (408) 946-9000.	Assigning chores.	Rotates chores fairly, provides accountability, and saves an hour of arguing a week.
	Budgeting.	Lets me make "What-if-?" changes in my long-range budget without time-consuming pencil-and-eraser changes.
Kitchen Planner , available for Apple. No further information available. Save-Soft Products, P.O. Box 24898, San Jose, CA 95154.	Menu planning.	Saves five to six hours a month and keeps our meals varied.
	Grocery shopping.	Lets me do two weeks' worth of shopping in 20 minutes, eliminates additional trips to the store, and cuts down impulse buying.
Dietician , available for Apple II (w/ Applesoft ROM)/II plus/IIe, 48K. \$59.95. Dietware, 810 Peakwood Drive, Suite 107, Houston, TX 77090; (713) 440-6943.	Menu planning.	Helps keep us aware of our calorie intake!
MicroCookbook , available for Apple II plus/IIe/IIc, 48K; IBM PC/PCjr, 64K. \$40. Virtual Combinatics, P.O. Box 755, Rockport, MA 01966; (617) 546-6553.	Menu planning.	Saves on the expense of cookbooks and can tailor meals around what I have, not what I need to buy.
Dollars and Sense , available for Apple II plus/IIe/IIc/Macintosh, 64K; IBM PC/PCjr, 64K. \$100 (Apple II); \$119 (Apple IIc); \$149 (Macintosh); \$179 (IBM). Monogram, 8295 S. La Cienega Blvd., Englewood, CA 90301; (213) 215-0529.	Budgeting.	Saves me nearly two hours a month balancing my checkbook, and three days a year preparing for tax time. Shows me, in instantaneous picture form, whether I'm sticking to my budget.
The Smart Checkbook , available for Apple II plus/IIe (w/CP/M), 56K; IBM PC, 64K/PCjr, 128K. \$149. Softquest, Inc., P.O. Box 3456, McLean, VA 22103; (703) 281-1621.	Budgeting.	Saves the time of double entries; once on the check itself, and then in the checkbook.
Smartcom I (communications software for use with Hayes Micromodem IIe), available for Apple II/II plus/IIe (w/ DOS 3.3, CP/M 2.2, or Pascal 1.1). \$119 (\$329 when sold with Micromodem IIe). Hayes Microcomputer Products Inc., 5923 Peachtree Industrial Blvd., Norcross, GA 30092; (404) 449-8791.	Banking.	Lets me do my banking at my convenience, rather than at the bank's.
Comp-U-Store , accessed by modem through CompuServe. CompuServe, 5000 Arlington Centre Blvd., Columbus, OH 43220; (614) 457-8600.	Gift shopping.	Lets me shop from home, and saves my peace of mind around Christmastime.
PowerText , available for Apple II plus/IIe/IIc/III, 64K; IBM PC, 128K. \$299 (Apple); \$399 (IBM). Beaman Porter, Inc., Pleasantridge Road, Harrison, NY 10528; (914) 967-3504.	Correspondence.	Cuts my correspondence time down by half.
PFS:file , available for Apple II/II plus, 48K; IIe/IIc, 64K; III, 128K; IBM PC/PCjr, 64K (w/ DOS 1.0). \$125 (Apple II); \$140 (IBM). Software Publishing Corp., 1901 Landings Drive, Mountain View, CA 94043; (415) 962-8910.	Storage.	Saves me the time and exasperation of endless searching, and cross references a collection into numerous categories, keeping long-forgotten items at my fingertips.
VisiSchedule , available for Apple II/II plus/IIe, 48K; III, 128K; IBM PC, 128K. \$149 (Apple II); \$195 (IBM); \$300 (Apple III). VisiCorp (see address under <i>VisiCalc</i> above).	Vacation planning.	Cuts my vacation planning time down by a third and eliminates forgotten items.

Benefits: I can do a letter in half the time it took me before. No more wasted minutes counting spaces in from the margin in an attempt to center a heading; now my computer does it for me! And the printer has eliminated trips to a store with a copy machine.

STORAGE

Before: Since all three of us like to read, we soon had more books lying about than the Library of Congress. The problem was finding the one we wanted. Was it on the bookshelves, in a closet, or in the cabinet?

Now: I use *PFS:file* to keep track of where our books are kept. I update the file every time I get a new book, about five to seven times a month. The program not only helps me know where a book in our collection of 800 is stored, but acts as a handy cross-reference system, since books can be called up by numerous keywords such as TITLE, SUBJECT, AUTHOR, PUBLISHER, and LOCATION. During the school year I use this program every day. (It also keeps track of our winter clothing, my files, etc.)

Benefits: The computer saves the time and exasperation of endless searching, but most of all it cross-references a collection into numerous categories, so long-forgotten items are at my fingertips.

VACATION PLANNING

Before: Last summer we bicycled from Hamburg to Göttingen, Germany. The year before that we toured 17 states in the U.S. Next summer we plan to hike through France. Planning vacations takes time, budgeting, and attention to detail, and if it's not done right it can quickly become an exercise in creative frustration. School vacations are set, the boys' long-range class assignments must be done beforehand or nobody goes anywhere, and costs can easily double.

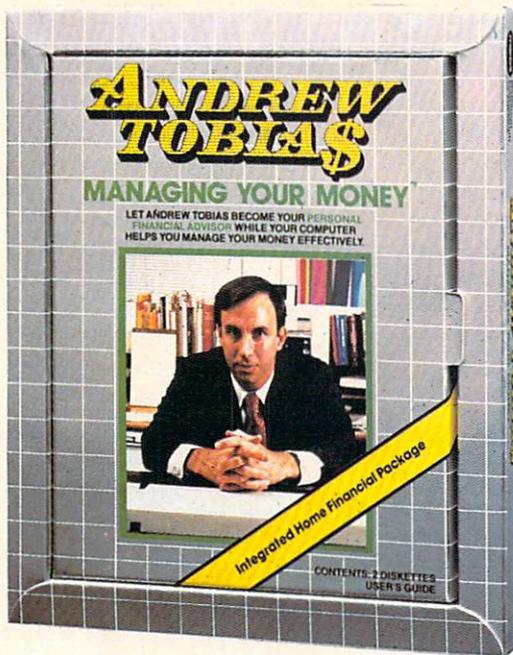
Now: I use *VisiSchedule* to help me break my vacation planning down into manageable, trackable segments: planning the route, assembling the equipment, etc. Then I put the planned departure date in. Next, I enter things in the order in which they must be done. For example, I must plan the route before I purchase tickets, but I must purchase tickets at least 90 days before departure, etc. *VisiSchedule* lets me know whenever there's a conflict, as well as who is responsible for what by when.

Benefits: The computer has cut trip planning time by a third, and we never find ourselves on a pack trip without a can opener! But most of all, we no longer leave for vacations already tired from last-minute rushing.

TIME TOGETHER

All of the programs that I use to run our single-parent household are canned ones which can be picked up off the store shelf. Yes, I've learned to program in the meanwhile, but I still have an aversion to reinventing the wheel. I use my programming knowledge only occasionally—to change a spoke—but that's about it.

I'm not a blind apostle of the computer. It's purely a tool. (Neither the boys nor I play games on the computer, although Pat loves video arcade games.) It's a powerful tool, one that gives us control and safeguards our time. And that's what our life together is all about. ☐



How to Manage Your Money? Get Organized!

BEST-SELLING AUTHOR ANDREW TOBIAS HAS TURNED HIS FINANCIAL KNOW-HOW INTO A POWERFUL MONEY-MANAGEMENT PROGRAM

BY NICK SULLIVAN

The subject of money makes me a little edgy, so I had a good case of the jitters on my way to see Andrew Tobias. I stopped off to get some papaya juice to calm my stomach. I imagined the author of *The Only Investment Guide You'll Ever Need* as some kind of financial high priest who would quiz me on annuities. Annuities?

As it turns out, Tobias is Mr. Straight Talk. Unlike most bankers and brokers, Tobias' big thing is to demystify money. I should have known. *The Only Investment Guide You'll Ever Need*, which has sold nearly 1 million copies since 1978, is straightforward, helpful, and fun. Both he and his new financial software, *Managing Your Money*, are no different.

The program (see accompanying review) is a powerful tool that keeps budgets, figures insurance needs, tracks portfolios, and calculates taxes. Along the way it manages to teach and advise, and explain arcane concepts such as annuities!

Tobias, now primarily an author, started out as a young tycoon. At Harvard, where he studied Slavic languages and literature, he was president of Harvard Student Agencies, a student-run company that produced the Let's Go travel series—student guides to Europe. When he graduated in 1968, Tobias was hired by National Student Marketing. "They said, 'If you could make \$1 million on one campus, just think what you could do on 2,000 campuses.'"

NSM's stock shot from 6 to 140, and Tobias held "paper profits" of \$400,000. "At 21, I was traveling around with a Youth Fare Card in one hand and an American Express card in the other." But then the bubble burst: The company's stock plunged back to 6, and the president went to jail. Tobias wrote about the

company's fall from grace, and started his now-successful career as a writer.

Tobias, 37, has also written *The Invisible Bankers*, an inside view of the insurance industry; *Fire and Ice*, a biography of cosmetics mogul Charles Revson; *The Funny Money Game*; and *Getting By on \$100,000 a Year (And Other Sad Tales)*. A new book, *Money Angles*, has just been published.

Managing Your Money is Tobias' first foray into software design. But the program carries with it the weight of much of his published work. Before Tobias had a chance to find out how little I knew about finance, I started asking questions and let him do the talking.

FC: What's the number one financial task for most people?

Tobias: People spend a lot of time paying bills, then reconciling their checkbook. I don't do that, but a lot of people do. I figure the bank knows how to add and subtract. People also spend a lot of time worrying about money in a very unorganized way.

FC: What's the primary benefit people will get out of *Managing Your Money*?

Tobias: It will help get them organized. And when you're organized financially, you're in control. You can make intelligent decisions. The program will also help people set goals and make plans to reach them. Make a plan and go.

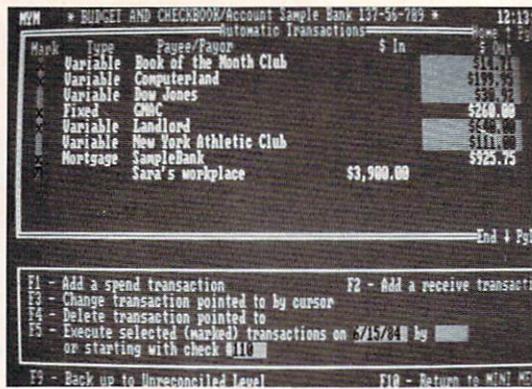
Sacrificing a night on the town to save \$75 or \$100 is a boring, depressing, and pointless thing to do—if it's a one-shot thing. But if it's part of a plan to put you in the black, or to contribute toward a long-term goal, then the sacrifice can be satisfying, almost pleasing.

FC: From the end-user's point of view, what's

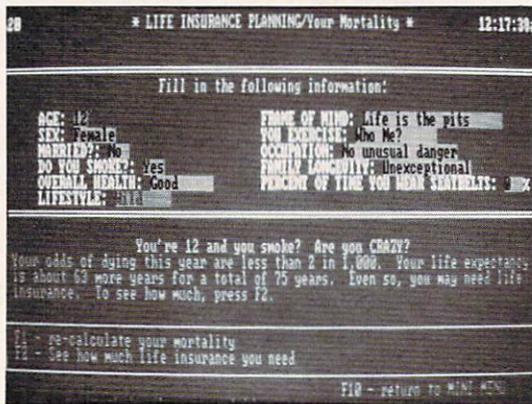
"AT 21, I WAS TRAVELING AROUND WITH A YOUTH FARE CARD IN ONE HAND AND AN AMERICAN EXPRESS CARD IN THE OTHER."

NICK SULLIVAN is features editor of FAMILY COMPUTING. His last article was "Apple Heads For Home" in the June issue.

In the BUDGET AND CHECKBOOK section of Managing Your Money you can list your creditors, and whether the regular payments are FIXED or VARIABLE. You then mark (with an "x") the bills you want to pay, and hit F5 (function key 5) to print out the checks.



In the LIFE INSURANCE PLANNING section you answer a few questions, then press F1 (to RE-CALCULATE YOUR MORTALITY) or F2 (to SEE HOW MUCH LIFE INSURANCE YOU NEED). (This mock screen is obviously just a sample.) Notice that in both these sample screens, and throughout most of the program, you can maneuver with one-key commands, all marked on-screen.



the difference between your book and your program?

Tobias: The book tells you things. The computer program does things. Every screen on this program jumps up and does something! Or, as I've become fond of saying, it's the difference between a cookbook and a fully equipped kitchen with a microwave and all the latest appliances.

I think the program delivers more value than the book. It has more impact on people. I don't mean that in any "holy mission" sense. I mean people might spend only five or six hours with one of my books, and get a few chuckles. But *Managing Your Money* is something people could use an hour a week for years.

FC: How do you use *Managing Your Money*?

Tobias: I use the program in two ways. I trade a lot in stocks—oh, not constantly, but every few days. From time to time I might want to see where I stand with short-term gains, long-term losses, etc. I might want to make a sale, for tax purposes, before the end of the year. So, if I check in the PORTFOLIO section of the program, I can see a record of the year's activity. The program will tell me where I stand financially—and it tells me in English where I stand on taxes. Something like, "With long-term gains of \$5,000 you will pay about \$1,800 in taxes. Strictly from a tax standpoint, it would make sense to take at least enough losses to wipe out your gains."

I also write checks with the program. It used to be that whenever I got a bill I'd pay it. It wasn't the greatest use of cash—you're supposed to wait 30 days and get interest on your

money—but it worked. Now, when I get a bill, I put it in a folder next to the computer. Then, every two weeks or so, I go through the folder and pay the bills. Since I've already written in the names of my regular creditors, like the phone company, and anyone else I've ever paid before, I never have to write the name on the check, write out the amount in English, or address the envelope. I just punch in 34.78 in the phone-bill category, make sure the checks set are straight in the printer, and hit the key. Out come 15 or 20 checks to be signed.

Plus, the check information automatically feeds into the BUDGET and TAX categories.

FC: How does this help you with your taxes?

Tobias: At tax time—I do my own—I can print out all my expenses organized by tax and budget category. For instance, this \$50 check to my answering service would show up, along with 11 others for the year, in the budget category I've labeled ANSWERING SERVICE. That would be one of several categories under the tax heading OTHER SCHEDULE C EXPENSES. My answering service is deductible as a business expense.

Even if people use an accountant to do their taxes, they still have to provide most of the information, so the program reduces what used to be a big project down to just a few keystrokes.

FC: Isn't it time-consuming to set up all your budget categories and enter the names and addresses of creditors, then boot up the computer and load checks into the printer every time you want to dash off a few checks?

Tobias: Of course. It's not practical to print out a single check: The real time-saver is to use the program to pay a week's or a month's bills all at once. Most of the data-entry work you do only once, though you can always go back and add or delete categories. And, don't forget that each time you make an entry in one category, it automatically hits the other pertinent parts of the program so that you always have a full and current financial picture.

FC: How useful is the program for people who don't know anything about money?

Tobias: The manual that comes with the program is purposely very thin, just a start-up guide. But within the program, there are more than 30,000 words in 180 pages of HELP screens. On some topics, such as life insurance, you can read three or four screens full. Or, in the financial calculator section of the program—we don't just calculate annuities or internal rates of return on real-estate investments—we tell you what these things mean.

FC: That's great! There's a small book inside the computer. Can you give an example of how the HELP screens might guide a neophyte through new financial territory?

Tobias: Say you see this apartment building building down on L Street. It costs \$250,000 and you're

"WHEN YOU'RE ORGANIZED FINANCIALLY, YOU'RE IN CONTROL. YOU CAN MAKE INTELLIGENT DECISIONS."

considering buying it with two friends as a tax shelter. You go to your brother-in-law the accountant and say, "Look, what do you think?" With the program you could answer a lot of the questions yourself by going to the RENTAL PROPERTY ANALYSIS section.

To figure out the value of a certain piece of property as a real-estate investment, you're asked to answer several questions. Say you didn't know what "depreciation" was. You could look that up on the HELP screen. So, even if you don't know the terminology, you can noodle around.

FC: How could you noodle around?

Tobias: Say you wanted to forget about the tax benefits, and consider the property on a straight economic basis. Just enter 0% in the TAX BRACKET slot. It might turn out that without the tax benefits you'd actually lose money on the deal, but in the 40-percent tax bracket you get an 8 percent annual return. That's an interesting thing to know, but very time-consuming to calculate by hand.

FC: In other words, you could learn a lot from this program without consulting an accountant or lawyer.

Tobias: I didn't say that. Well, actually it's true, but we strongly advise consulting a professional before taking any significant steps.

FC: It seems like you could play a lot of "What if" games with this program.

Tobias: Sure. Give yourself a hypothetical \$50,000 and play the market. Then go back after four months or four years and see where you stand. Or, go to the tax section and see—in seconds—the effect of getting a bonus, having a baby, or cramming as many deductible expenditures as possible into this year versus holding them for next year. It's a real time-saver when you're playing around with income averaging or the alternative minimum tax.

FC: Any financial tips, not necessarily computer-related, for our readers?

Tobias: No. 1, get organized. Everyone wants to, everyone talks about it—and most people don't.

No. 2, be realistic. Most people think that they're missing out on some big secret; that their money only brings 10 percent a year, but if Andy Tobias or Nick Sullivan had that same \$1,000 it would turn into \$4,000 overnight.

Consequently, people go looking for special deals and it's usually those who can least afford it who get into the worst deals. You know the type: You get a call from someone who says, "Coffee's going to go through the roof; I heard about it in Brazil. You can turn your \$2,800 into \$40,000." Instead, you lose your \$2,800. Mind you, that's an example of a "fringe" deal, but you've got to be careful with the Wall Street firms too.

FC: What's the best investment you ever made?

THE BOTTOM LINE: A REVIEW OF MANAGING YOUR MONEY

Managing Your Money is an extremely powerful program (for IBM PC, XT, AT, PCjr, and soon for Apple IIe and IIc) that assumes you have no knowledge about either money or computers. The accompanying documentation is thin and to the point—enough to get you started. Once inside the program, you can run through HELLO, NEW USER, a 20-minute introduction, and you're off. If you need future assistance, there are 180 HELP screens, and a book-length index.

Managing Your Money contains seven sections: 1) an electronic memo pad; 2) a checkbook, budget, and cash-flow program that prints checks and forms bar graphs; 3) a tax program that includes screens for tax Form 1040, W-4, and schedules A, B, C, D, E, and G) and insurance program that allows you to evaluate your life insurance needs and track your home and car insurance; 5) a financial calculator with analytical sections on loans, retirement, tax shelters, and rental property; 6) a portfolio manager that allows you to track your stocks, bonds, and options (and even the value of your coin or wine collections); and, 7) a net-worth calculator that can be customized for special assets.

Moving from one section to another is as simple as pressing a key, with instruction on-screen at all times. Printing what's on the screen and moving into calculator mode are also single-key commands.

BURIED TREASURES

You might buy a stand-alone checkbook/budget program, but you would probably never buy a separate life insurance program, or a program to analyze rental real estate. With *Managing Your Money*, they're there if you need them. In that sense, the program is a compact financial control center that will probably educate you and help expand your horizons.

The program is filled with helpful tidbits that draw on the experience of its authoritative author, Andrew Tobias. Like a chameleon, the computer suddenly turns from a number cruncher into a financial advisor. For example, once you're told how much life insurance coverage you need, it tells you how much you should ex-

pect to pay for it, and the names of two companies that offer good rates. In most cases, the computer talks to you in complete sentences, rather than just spouting hard numbers.

You can also set a budget for the year, allocating a certain amount in various categories. As the year forges onward and you make your monthly entries, you can check your spending against your budget. These records can later be dumped into the tax calculator. If you use the program to pay bills, you'll need special checks to fit your printer (about \$50 for 1,000).

EXTRAS

One of the "bells and whistles" in the budget section is the chart-making capability, which works best with a color monitor. Press a button, and you'll see a bar graph comparing expenses to budget. Similarly, a cash-flow projector vividly shows you when you dip into the red. Charts elsewhere in the program are less dramatic and less useful.

The support for *Managing Your Money* looks good. Tobias will be writing a quarterly newsletter for owners of the program, with tips on how to use it, and mentioning changes in tax laws. A communications option is expected sometime this fall, which will allow users equipped with modems to call up Dow Jones and other information services for stock prices, which can then be incorporated into the PORTFOLIO MANAGER section.

Managing Your Money is not the only program of its kind (watch for a complete rundown of home financial software in a future issue), nor have I tested all the competition. But, it is definitely one of the more engaging pieces of software I've ever used. It does mundane tasks quickly, and it allows you to do complex tasks that you might not otherwise attempt. Isn't that what computers are supposed to do? —N.S.

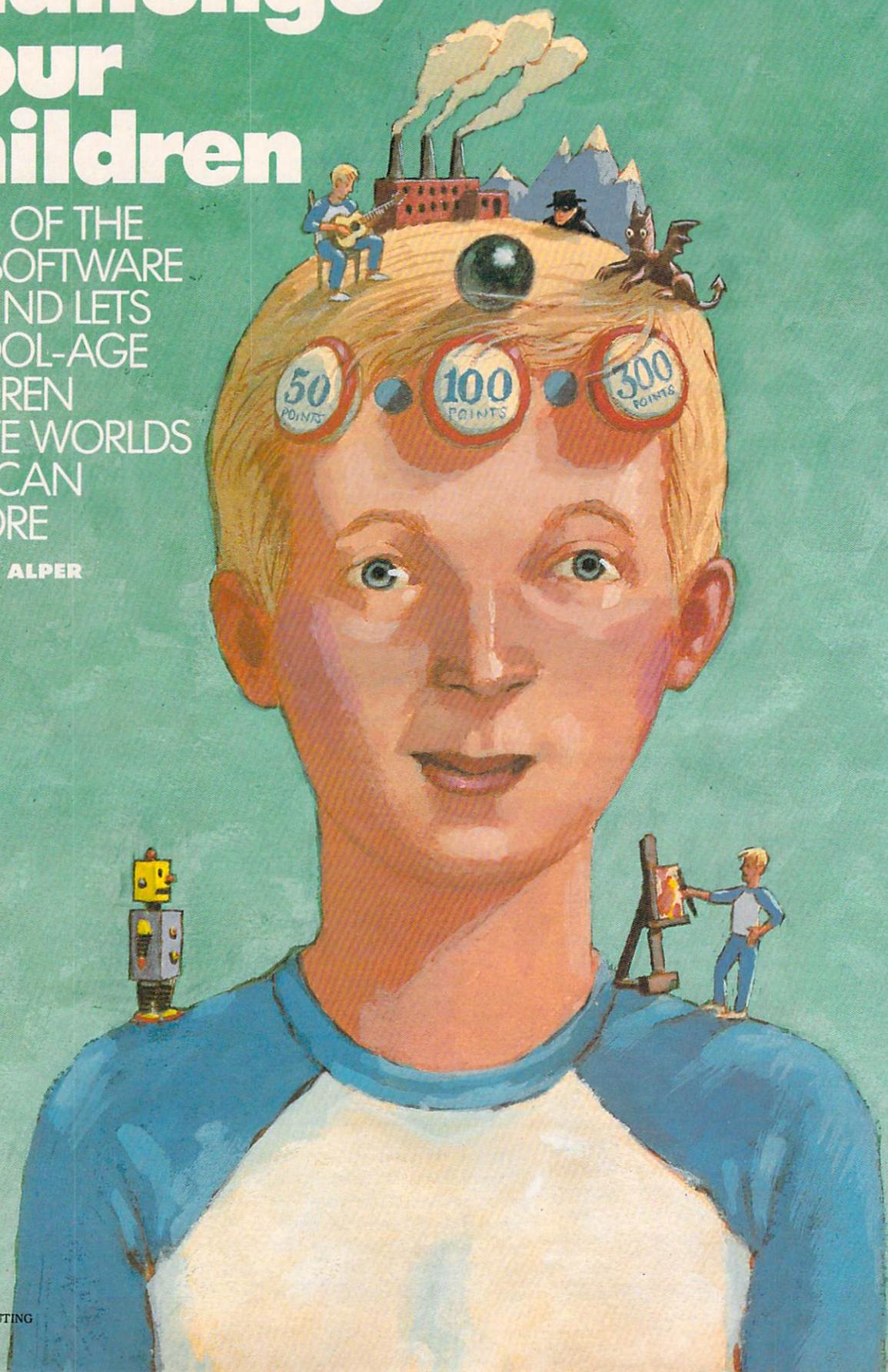
Managing Your Money, by MECA, available for IBM PC, AT, or XT (128K, one disk drive), and PCjr (256K); three disks, \$199.95. IBM PCjr version by IBM Corp., (128K, one disk drive); one cartridge, two disks, \$199.95.

Tobias: Buying this apartment [overlooking Central Park in Manhattan]. That was eight years ago when they said New York was going down the tubes. The second best may have been buying a condo in Miami last year. I got the idea when I saw a *Time* cover story saying Miami was going down the tubes. ☐

Software to Challenge Your Children

SOME OF THE BEST SOFTWARE AROUND LETS SCHOOL-AGE CHILDREN CREATE WORLDS THEY CAN EXPLORE

BY LYNNE ALPER



As the holiday season approaches, you may have already added a new computer game to the gift list for your child. For many parents out there, this may be the way your thinking is going: You don't want an arcade-style video-game. You want your children to learn at the same time they're having fun. But you don't want a classroom-style "drill-and-practice" program. What to do?

There's a wealth of alternatives—"fun-learning" programs that will entertain your children and teach them valuable thinking skills at the same time.

Although the subject matter varies widely—from math and science to art and humanities—these "fun-learning" programs have one thing in common. They provide an environment where kids can explore and experiment. Rather than present rigid questions that have a single solution, programs of this kind encourage children to think creatively, try out ideas, see what happens, and try again. The problem-solving skills gained are important for kids because the real world rarely presents situations where the answers are clear cut.

Following is a brief overview of the kinds of educationally valuable programs my three children (now ages 8 to 12) have enjoyed at home over the past four years (originally with a Commodore PET and more recently with an Apple IIe). Although some of them might be appreciated by children as young as 3, most require at least minimal reading ability to be used independently. Some are also challenging to adults and can be enjoyed by parents and children working together. Of course, what's covered here is just the tip of the iceberg. (See the accompanying list of favorites of three FAMILY COMPUTING reviewers.)

SIMULATIONS

Simulations are particularly well-suited to teach problem-solving skills. Because computers can store large quantities of information, they can simulate real-world activities as complex as running a small business or building a pinball machine. Of course, no simulation can exactly replicate an actual experience. But simulations can give children a rough feel for what it's like to enter a world that would be too dangerous or even physically impossible to experience in real life. Sometimes children may learn even more from simulations than from the real world, because they simplify the world and make it easier to focus on a few important variables.

Lemonade (Apple Computer Inc. and Commodore) is a classic simulation game suitable for children ages 7 and up. In *Lemonade*, the user is provided with a lemonade stand to run on Saturdays during the summer, along with a loan of \$2 to get started. The goal is to

pay back the loan and make a profit by the end of the summer.

Each Saturday, there are three decisions to be made: how many glasses of lemonade to make, how much to charge for each glass, and how many signs to buy to advertise the stand. But, as in real life, not all the variables can be controlled. Occasionally there may be unpredictable thunderstorms, or nearby street repairs may attract thirsty workers. At the end of each day—and at the end of the summer—the computer summarizes the profit or loss.

I've seen my own children engrossed in this game for long periods of time, sometimes competing against one another, sometimes working together against the computer. In fact, another advantage of problem-solving activities like *Lemonade* is that they encourage social interaction around the computer.

While *Lemonade* simulates economy in the real world, a newly released program called *Robot Odyssey* (The Learning Co.) uses the computer to simulate a part of the physical world that would otherwise be invisible. *Robot Odyssey* guides its users into the microscopic world of electronics where they can observe how current flows through electrical circuits. As they explore this world, kids learn how to combine wires and connectors of various kinds to design their own "integrated circuits" or "chips"—just like those used in computers.

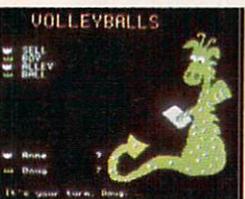
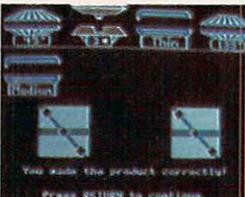
Once designed, these chips can then be wired inside robots. The challenge is to get the robots to respond to outside stimuli in a predictable way in order to accomplish a particular task. If, for example, a robot's batteries are running low, a child might decide to program it to automatically "grab" any "energy crystals" it encounters in its travels. In thinking through problems like this, kids are learning not just about electronics, but also about programming—how to break a task down into its component parts and devise a set of instructions that will accomplish it.

Because of its complexity, *Robot Odyssey* will probably appeal more to children ages 13 and up. For children as young as 7, *Rocky's Boots* (a predecessor to *Robot Odyssey*) also simulates the flow of electrical current and provides the tools to construct circuits.

Pinball Construction Set (Electronic Arts) is another excellent physical-world simulation with great color and sound that can be absorbing to children ages 9 and up. This program provides the tools to build video pinball machines from a selection of "bumpers," "flippers," and other parts. At any time, kids can stop to run a ball through the machine, see how it behaves, and then alter the game. If they like, they can even use effects that would be impossible in the real world—like invisible bumpers or zero gravity. As they play with this

COMPUTERS CAN SIMULATE REAL-WORLD ACTIVITIES AS COMPLEX AS BUILDING A PINBALL MACHINE.

LYNNE ALPER (and MEG HOLMBERG, who helped prepare this article) coauthored Parents, Kids, and Computers: Learning Adventures Beyond the Classroom; and Parents, Kids and the Commodore 64 (Sybex Computer Books).



Story Maker (Scholastic Software) allows kids to write 12-page stories, illustrated with drawings from the "graphics gallery" or of their own making.

Robot Odyssey (The Learning Co.) guides users through the microscopic world of electrical circuits. Kids can design their own "chips"—just like those used in computers.

In Factory (Sunburst), kids create their own assembly lines by combining machines in sequence. Raw materials enter from the left and emerge on the right as products.

Wizard of Words (Advanced Ideas, Inc) includes five word-challenge games that teach kids to spell.

simulation, kids learn in an intuitive way basic principles of mechanics and physics.

ADVENTURE GAMES

Computers can also be used to create vast imaginary worlds. There are a variety of these imaginary "adventure" games available for every brand of microcomputer (see "The Lure of Fantasy and Adventure Games" in the October 1983 FAMILY COMPUTING). While many of them use color, sound, and graphics, I've found the most engaging to be those that use only black-and-white text. The effect is like that of reading a good book that brings to mind vivid images of the landscape and the characters that inhabit it.

Among the most popular commercially available adventures is a series of three programs called *Zork*, which take the player into a vast, underground kingdom inhabited by thieves, trolls, and other dangerous creatures. By giving the computer instructions in full English sentences (like GO AROUND THE HOUSE), the player explores a maze of rooms and tunnels in a search for treasures that must be brought back to the surface.

Although the learning value of adventures like *Zork* may not be readily apparent, these games actually help kids develop a wide range of skills. Finding the way from one step to the next requires ingenuity and willingness to experiment. At the same time, to play a game well, players need to keep track of hundreds of miscellaneous pieces of information accumulated along the way, a task that draws on more methodical thinking. My 10-year-old son began to draw maps in order to consolidate these details into one cohesive picture, and this in itself is a valuable learning exercise.

Zork's extensive text descriptions also call on kids to read carefully and to remember what they've read. This means that to use it independently they'll need to be confident readers (at least fourth-grade level). But *Zork* and other complex adventure games can also be entertaining to younger children when they're played as a cooperative family activity. Because everything in these imaginary universes is new, they tend to put adults and kids on an equal footing.

For children in second through fifth grade, *Aegean Voyage* (Spinnaker) is a simpler, more structured adventure that makes use of vivid graphics and music. With a fleet of three ships, the child sails through a world of 16 islands gathering the clues that will lead to hidden treasures.

GAMES OF LOGIC

While simulations and adventure games provide open-ended worlds for kids to explore, other excellent learning programs pose well-defined puzzles designed to develop logical thinking and reasoning. For example, the award-winning program *Gertrude's Secrets* (The Learning Co.) presents geometric shapes

of various colors on the screen and asks the child to guess a secret rule that determines which pieces belong together. The rule might be ALL THE RED PIECES OF ONLY BLUE SQUARES. As they experiment to see what pieces go together, children are learning to observe "attributes" or characteristics of specific objects, and then to identify patterns or relationships between them. These are essential everyday skills that enable us to make sense of a complex world.

Another example of a well-designed logic game is *Factory* (Sunburst)—a learning program that gives kids practice in a particular kind of thinking known as "spatial reasoning." With this program, kids create their own assembly lines by combining machines in sequence. The raw materials are dark squares that enter the factory from the left and emerge on the right as "products." The machines are of three general types—"punchers" that punch holes in the square, "rotaters" that turn the square, and "stripers" that draw a line across the square.

Once children have experimented with the machines enough to understand what they do, they're ready to play the game. The program presents them with a final product that has been punched, rotated, and striped. The challenge is to come up with the sequence of machines (the factory) that made the product.

In order to solve the puzzle, kids have to visualize how the square moves in space, and determine which steps had to take place to turn it into the final product. Then they have to translate these steps into a sequence of machines. This kind of reasoning is basic to a variety of real-life professions such as engineering and architecture.

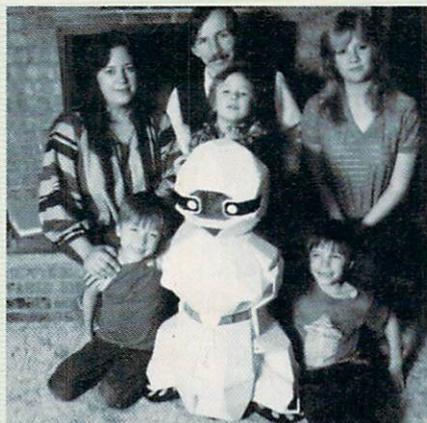
THE COMPUTER AND ART

Just as word-processing programs let kids experiment with words and make changes easily (see "Word Processing: For Kids, Too," in this month's Home-School Connection), computer art and graphics programs make it possible to experiment freely with color and design. Although computer art can't (and shouldn't) replace mixing paints and moving a brush on paper, the computer makes it possible to achieve some unique effects that would be difficult or impossible on paper. For example, with some programs, children can ask the computer to make multiple mirror images as they draw, creating a mandala-like effect.

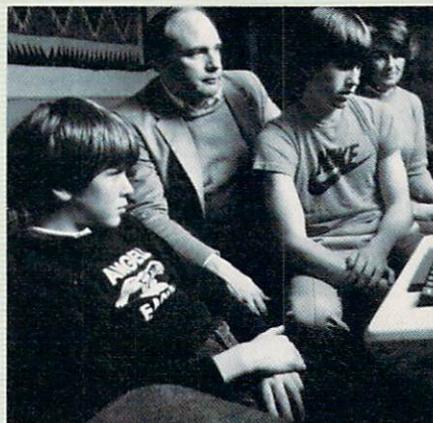
At this writing, one of the most sophisticated but easy-to-use graphics tools available for microcomputers is the KoalaPad and its *Koala Painter* program. The KoalaPad is a hand-held plastic tablet about the size of a book, which attaches to the computer. By pressing the surface of the pad with a stylus, kids can draw designs on the computer's screen with lines of a chosen width and color. Then by selecting colors from a "palette" on the screen, they can direct the computer to fill enclosed areas with a single color or even a multi-

WHAT'S FUN AND TEACHES, TOO?

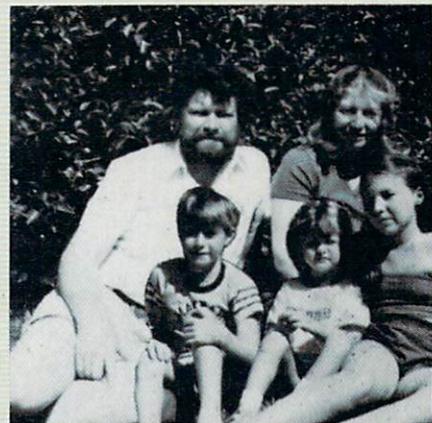
Educational software can entertain and teach at the same time. FAMILY COMPUTING reviewers BETSY BYRNE, MARLENE ANN BUMGARNER, and TONY MORRIS survey the roster of programs their families reach for regularly.



PHOTOGRAPH BY TOM O'BRIEN



PHOTOGRAPH BY ANDREW SACHS



BY BETSY BYRNE

Here's a secret my husband and I discovered shortly after we bought our Commodore 64. Children think that everything done on a computer is a game. Our three youngest kids, ages 6-8, seem to feel that if the computer is involved, it has to be fun.

The first program that the kids and I explored together was *Zortek and the Microchips* (Commodore). *Zortek* (formerly *Gortek*) introduces kids to the Commodore 64 or VIC-20 computer. Although the program is recommended for children 10 and up, the boys had no trouble using it when they were 6, with a little help from me. Armed with our new skills and the knowledge that we were protecting *Zortek's* planet from a bunch of nasties by increasing our programming knowledge, we learned about PRINT statements and memory locations, and before long, were writing simple BASIC programs.

Then came *Kidwriter* (Spinnaker), a magical "story processor" for children which they can use to create their own illustrated storybook on disk. Budding young authors have 99 different objects (people, buildings, animals, vehicles, shapes, letters, and more) to compose their pictures with, eight to a page. After designing an illustration, the children create text to go with their picture, which can be saved to disk and played back later (with a cheerful tune), in sequence with other pages of their story. Before we knew it, Timmy and James (and sometimes Molly) were offering to read us bedtime stories they had written and illustrated with *Kidwriter*.

With *Pipes*, our kids spent hours connecting all the houses in a small town to the local water tower. Choosing from a bewildering array of angles, joints, straight pieces, and valves, they sometimes even completed the job sans leaks, with some pipe-purchasing money left!

Many a crayon has been broken, and numerous papers torn up in frustration by a small would-be artist whose abilities did not match his, or her inner vision. With *Koala Painter* (Koala Technologies), for the Koala Pad, suddenly round circles, square squares, and very straight straight lines were within our children's grasps.

BY TONY MORRIS

Our family is hard to please, especially when it comes to educational software. My kids look for fun, and I look for content.

Spellicopter (DesignWare), for instance, combines spelling and flying a helicopter in a winning program. Given a sentence with one word missing, you must pick up scrambled letters one at a time, fly each one back to your home base as quickly as possible without running into any obstacles, and then return for the next letter until you've correctly spelled the missing word. In addition to the 400 words included on the disk, you can add your own, using *Spellicopter* to learn foreign-language vocabulary, names, or dates. It's as flexible as it is educational. DesignWare's *Math Maze* does for math skills what *Spellicopter* does for spelling.

When kids can play games and not know they're learning, then you've struck gold. Our kids spent hours with *Master-Type* without realizing what was up. Blast alien invaders by typing correctly, before their missiles destroy your command ship.

On top of basic skill-building, we've found software that encourages kids to write. *That's My Story* (Learning Well) gives you 12 starter plots out of which you fashion your own branching stories. Each plot's twist leads to more twists, which friends can read and "play."

Imagine shrinking to almost nothing and entering a blood vessel to journey through the body. Navigating safely in *Microbe* (Synergistic Software) is tough enough as it is, but at the same time you must defend against attacking microorganisms and maintain fuel and oxygen supplies, while learning all about anatomy.

Music may not spring to mind when thinking of education and the computer. *Songwriter* (Scarborough Systems) will change all that. A gentle, engaging introduction to music, it works like a player piano and helps kids learn to link notes' visual patterns with sounds.

Finally, in a category by itself, *Microzine* (Scholastic) is a magazine on a disk. Each "issue" contains an interactive story and some sort of utility program introducing one of the computer's many applications, such as data-base management and a host of other engaging extras.

BY MARLENE ANNE BUMGARNER

It's beginning to look as if 8-year-old John is finally, and voluntarily, moving from arcade-type games to software with a little more substance.

Three that he enjoys are *Ranch* and *Grandma's House* (both Spinnaker), which allow him to arrange pictures on the screen, and *Gertrude's Secrets* (The Learning Co.), which presents logic puzzles and lets him redraw shapes used in the games. He thoroughly enjoys writing and illustrating colorful stories with *Story Maker* (Scholastic), and he's even taken to writing notes to his grandparents using the simple word processor contained in HesWare's *Type 'n' Write*.

By leaning towards games that let him exercise some measure of control over the program (instead of the computer demanding things of him), John is coming to view the computer as a real tool. With *Ranch*, he places characters, buildings, smoke, fences, etc., on the screen and moves them around until he's happy with the color and balance. He's designing an environment, learning about spatial relations, and much more.

While John enjoys playing alone, seventh-grader Doña plays her favorite computer games with someone else. Her current favorites are *Wizard of Words*, *Square Pairs*, and *Presidential Fever*, a new game we received for the IBM PC. One of the reasons she likes *Wizard of Words* is because she can occasionally beat me at it. Scrabble is one of her favorite board games, and *Wizard* contains games with Scrabble-like features, as well as a version of the ever-popular Hangman.

Doña and I use *Square Pairs* (Scholastic), a computer version of the TV show "Concentration," to quiz each other on just about anything.

Presidential Fever (Data Win) is well timed for an election year. Gaining points is based on the Electoral College system, and the winner is awarded either the party nomination or the Presidency itself.

It asks questions about the states. Gamers are asked to name the post-office abbreviation or spell out in full the state's name, capital, and largest cities, and, in the higher levels, are asked geographical, economic, and current-events facts.

SOFTWARE COMPANIES Mentioned in Article

Advanced Ideas, Inc., 2550 Ninth St., Suite 104, Berkeley, CA 94710; (415) 526-9100.

Wizard of Words, for Apple II series, 48K; IBM PC/PCjr, 128K (w/color card and DOS 1.1, 2.0, or 2.1). Version planned for Commodore 64. \$39.95 (disk).

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010.

Lemonade (now on *Elementary, My Dear Apple* disk in Apple Education Classics Series), for Apple IIe, 64K and IIc, 128K. \$20 (two disks).

Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380; (215) 431-9100.

Zortek and the Microchips, for Commodore 64 (disk) and VIC-20, 5K (cassette). \$24.95 (disk and cassette).

Creative Software, 230 E. Caribbean Drive, Sunnyvale, CA 94089; (408) 745-1655.

Pipes, for Commodore 64, VIC-20, 8K; IBM PC/PCjr, 64K. \$29.95 (disk, VIC-20: cartridge).

Data Win, P.O. Box 60995, Terminal Annex, Los Angeles, CA 90060; (213) 250-0196.

Presidential Fever, for IBM PC/PCjr, 128K. \$39.95 (disk).

DesignWare, 185 Berry St., Bldg. 3, Suite 158, San Francisco, CA 94107; (415) 546-1866.

Math Maze, for Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; IBM PC/PCjr, 64K (w/color card). \$39.95 (disk).

Spellicopter, for Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; IBM PC/PCjr, 64K. \$39.95 (disk).

Educational Audio Visual, 17 Marble Ave., Pleasantville, NY 10570; (914) 769-6332.

Weather Command, for Apple II/II plus/IIe, 48K. \$39.95 (disk).

Electronic Arts, 2755 Campus Drive,

San Mateo, CA 94403; (415) 571-7171.

Pinball Construction Set, for Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; IBM PC, 64K and PCjr, 128K. \$40 (disk).

HesWare, 150 N. Hill Drive, Brisbane, CA 94005; (415) 468-4111.

Type 'n' Write, for Commodore 64. \$29.95 (disk).

Infocom, Inc., 55 Wheeler St., Cambridge, MA 02138; (617) 492-1031.

Zork, for Apple II series, 48K; Atari Home Computers, 48K; Commodore 64 (available through Commodore); IBM PC/PCjr, 48K; TI-99/4A, 48K; TRS-80 Models I/III, 48K (available through Radio Shack). \$39.95 (disk).

Koala Technologies Corp., 3100 Patrick Henry Drive, Santa Clara, CA 95050; (408) 986-8866.

KoalaPad, for Apple (\$125); Atari Home Computers, Commodore (\$99); IBM (\$150).

Koala Painter, for Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; IBM PCjr, 48K. \$99 (C 64: disk); \$110 (Atari, C 64: cartridge); \$125 (Apple, IBM: disk).

Learning Company, 545 Middlefield Road, Suite 170, Menlo Park, CA 94025; (415) 328-5410.

Bumble Games, for Apple II series, 48K; Atari 800/1200XL, 48K; Commodore 64. \$39.95 (disk).

Bumble Plot, for Apple II series, 48K; Commodore 64. \$39.95 (disk).

Gertrude's Secrets, for Apple II series, 48K. \$44.95 (disk).

Robot Odyssey, for Apple II series, 48K. \$49.95 (disk).

Rocky's Boots, for Apple II series, 48K; Commodore 64. \$49.95 (disk).

Learning Well, 200 S. Service Road, Roslyn Heights, NY 11577; (800) 645-6564.

That's My Story, for Apple II series, 48K. \$59.95 (disk).

Scarborough Systems Inc., 25 N. Broadway, Tarrytown, NY 10591; (914) 332-4545.

MasterType, for Apple II series, 48K; Atari Home Computers, 32K and 16K; Commodore 64; IBM PC/PCjr, 64K. \$39.95 (disk; Atari 16K: cartridge).

SongWriter, for Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; IBM PC/PCjr, 64K. \$39.95 (disk).

Scholastic Software, 730 Broadway, New York, NY 10003; (212) 505-3000.

Microzine, for Apple II plus/IIe/IIc, 48K. \$39.95/issue (disk).

Square Pairs, for Apple II plus/IIe/IIc, 48K; Atari Home Computers, 16K and 32K; Commodore 64; VIC-20, 13K; TI-99/4A, 16K. \$19.95 (Atari, 16K; Commodore; TI-99/4A: cassette); \$24.95 (Apple; Atari, 32K; C 64: disk).

Story Maker: A Fact and Fiction Tool Kit, for Apple II plus, 64K; Apple IIe (w/extended 80-column card)/IIc, 128K. \$39.95 (disk).

Spinnaker Software Corp., 1 Kendall Square, Cambridge, MA 02139; (617) 494-1200.

Aegean Voyage, for Commodore 64. \$32.95 (cartridge).

Grandma's House, for Apple II series, 48K; IBM PC/PCjr, 64K. \$29.95 (disk).

Kidwriter, for Apple II series, 48K; Commodore 64. \$26.95 (C 64 disk); \$29.95 (Apple disk).

Ranch, for Commodore 64. \$32.95.

Sunburst Education, 39 Washington Ave., Pleasantville, NY 10570; (800) 431-6616.

Factory, for Apple II series, 48K; Atari Home Computers, 48K; Commodore 64; TRS-80 Color Computer, 32K. \$39.95 (disk).

Synergistic Software, 830 N. Riverside Drive, Suite 201, Renton, WA 98055; (206) 226-3216.

Microbe, for Apple II series, 48K. \$44.95 (disk).

color pattern. Children as young as 3 can begin making their own designs within minutes. At the same time, its capabilities are extensive enough for accomplished artists. (*George Booth does his cartoons* for FAMILY COMPUTING on a *KoalaPad* with *Koala Painter*.) For this reason, the *KoalaPad* can be shared by the whole family.

CHOOSING THE RIGHT PROGRAM FOR YOUR CHILD

Since buying just a few commercial programs may cost nearly as much as your computer, you'll want to consider how long the program will hold your child's interest. Generally, programs that call for open-ended experimentation and creativity (like those described above) will grow with your children and be used for many months. But there are other features to look for as well.

Some programs (like *Bumble Plot* and

Bumble Games, from The Learning Co.) offer varying levels of difficulty, so that once children have mastered a concept, they can move on to a more challenging variation of the same game. Other programs may offer kids a chance to make up their own games (as does *Square Pairs*, from Scholastic).

Finally, when trying out a program, ask yourself whether it will suit your child. As with any activity, children's interests and styles at the computer will vary. Some enjoy games that put them under a time pressure, while others would rather work in a relaxed way. Some will have little patience for directions, while others will want more structure as they learn.

Try to find a computer or toy store where your kids can try out a program with you. If it isn't fun for them, no matter how educational it might be, they probably won't use it. Fortunately, there's plenty of software around that satisfies both these needs. ☐

Star★Cards

The Sporting Life

Collecting baseball cards is a tradition that's lasted for generations, and now we've added a new set of stats to include... computer chronicles! Read on to find out how some of your favorite athletes are using their computers—off the field.

BY BOB CONDOR

(The first in a series of stories about celebrities and their computers.)

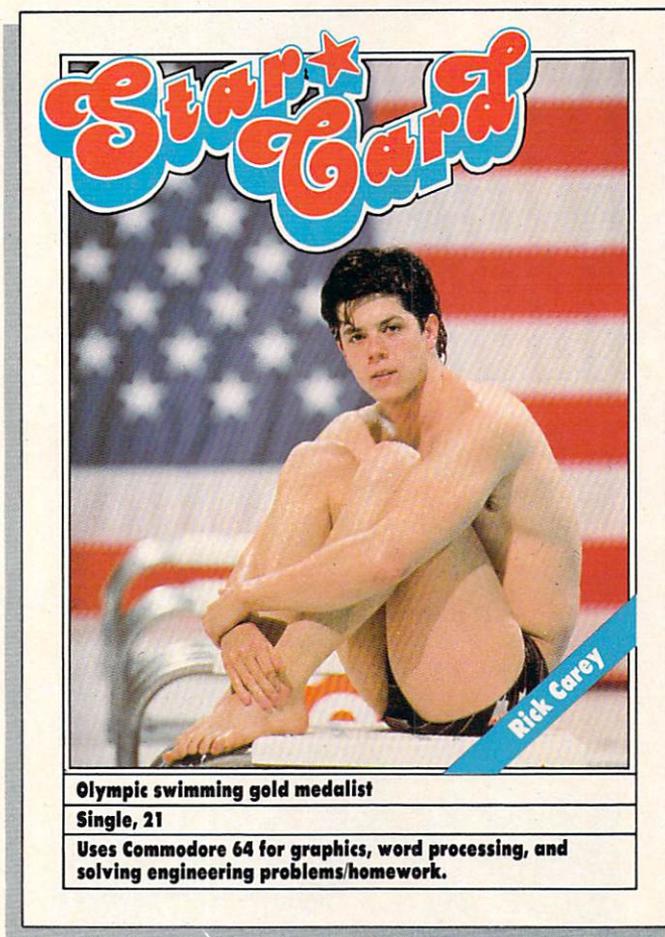
Computers. They've been a part of pro football chalk talks for about 10 years. And it's no secret that computer printouts have a say in more than half a dozen major league dugouts. In tennis, No. 1 ranked Martina Navratilova has revolutionized a highly traditional sport by using a personal computer to analyze her training habits and prescribe match strategy.

But what about away from the court or playing field? Are elite athletes, like the rest of us mere mortals, discovering how useful computers can be at home?

The answer is Yes. As more and more athletes have been accepting the computer as part of sports, they've been responding to the sensibility of the computer at home. Some use them to organize their personal lives and finances. Others find an educational use. And some simply turn them on to relax and play games. But they all agree: Computers are important in today's world.

Here's a look at five athletes who don't think championship trophies are the only valuable hardware in the house.

BOB CONDOR is the managing editor of *Sportswise* magazine in New York. He wrote last month's cover story, "The Never-ending Season of Sports Software."



A Star★Card for Rick Carey, an Olympic swimmer. The card features a photograph of Carey sitting on a pool deck with an American flag in the background. The "Star★Card" logo is at the top. A blue banner at the bottom right of the photo reads "Rick Carey". Below the photo, the text reads: "Olympic swimming gold medalist", "Single, 21", and "Uses Commodore 64 for graphics, word processing, and solving engineering problems/homework."

RICK CAREY, Olympic Swimmer

Rick Carey's mother likes hot-air balloons. So, one day Rick sat down in front of his Commodore 64, inserted his Logo software, and began "drawing" his mom a present. "It took me about five hours to get the balloon just right," he recalls, "but it was worth it. It turned out pretty cool . . . and my mom really liked it . . ."

Rick's mother, Jean, also

shares her son's pride in the three gold medals he won in the Summer Olympic Games in Los Angeles. And in the numerous titles he's snagged as the star swimmer for the University of Texas, a perennial collegiate powerhouse.

Rick has completed three full years at U.T., majoring in aerospace engineering. His C 64 has been a big help with his classes, saving him precious time during training. "The



computer is great for word processing, typing up papers, and other assignments," he explained last spring. "And I use it to take the drudgery out of doing structural engineering problems. These problems—let's say you are assigned 10—are all very similar in the nature of their solution, but the subtle twists take a lot of time. So instead of doing all the repetitive paperwork, I just do the first problem, write a quick program, then solve the rest of them in about half the time."

Still, Rick would rather wrestle with the Logo graphics than do his homework. "When I first started using Logo it was a lot of work," he says. "But it's the kind of language that the more you use it, the better you get at it. Now I find doing the graphics to be relaxing, something to take my mind off swimming and school."

Like many students his age (21), Rick was introduced to computers in a high-school class. "All we had was one terminal with a keypunch and a modem," he says about his Bedford, New York, high-school class. "It was interesting, but limited." Soon after that, his parents, both teachers, purchased a TI-99/4A to use at home. Rick played around on it, and last year he bought his Commodore, complete with a high-quality printer. "I think you're going to be 'handicapped' in a few years if you

PHOTOGRAPHS BY CRAIG MOLEHOUSE/SPORTS ILLUSTRATED

don't know how to use a computer," he says. "It'll be like not being able to read, or write, or use the telephone."

**LARRY HANEY,
Coach,
Milwaukee Brewers**

As a well-traveled major-league catcher, Larry Haney was one of those ballplayers who did everything just to stay with the big club. He was the classic team player, whether he was warming up pitchers in the bullpen, playing once a week as the backup catcher, or helping to steal the other team's signs. In all, he was with five different teams in 12 seasons, including three separate stints with the Oakland A's.

Now, in his seventh year as bullpen coach of the Milwaukee Brewers, Larry is still looking for that little something extra to help his ball club. He thinks he's found it with an Apple IIe, which he recently purchased.

Larry had planned to use his computer to design a system to scout all the players in the American League. "I wanted to study which hitters hurt us most in what situations." But he found it easier to use the club's data, and now plans to use *VisiCalc* to keep statistics on his own.

But Larry doesn't think his Apple will be fruitful just between the foul lines. "My family is very involved with the computer," he says. "We'll use it for much more than baseball." His wife, Connie, took computer courses last winter to understand the basics, so she and Larry could work with their three sons, Chris, 16; Kevin, 14; and Keith, 9. Connie learned to use *AppleWriter* in her classes; now she's a school volunteer who uses a computer to help with planning and record-keeping. This past summer, Larry hired a private tutor to work with him and his son—Keith worked on BASIC programming and Larry studied *VisiCalc*. And Chris, not surprisingly, uses a program to organize his baseball-card collection. "It's good for them to have access to a computer at home," says Larry, whose sons are proud to say their dad played in the 1974 World Series. "All three have their computer labs at school; this way they have some hands-on experience to support what they're learning."

Larry didn't make any quick decisions about which computer to buy. He consulted with several baseball types, including Steve Boros, former manager of the Oakland A's, an ad-

vocate of applying computer analysis to baseball strategy. Of course, Larry also studied product literature and chatted with computer-store salespeople near his family's home in Barboursville, Virginia.

"I think there's a place for computers in baseball," Larry says when asked why skeptics remain unconvinced about blending bytes with box scores. "Certainly, they will never replace the human mind. Computers are simply there to help the coach, not get rid of his job. The computer's capacity for storing and retrieving baseball information is outstanding."

Larry is equally enthusiastic about computers in the home. "We plan to take advantage of the Apple in many different ways," he says. "Society is such that it'll be important, especially for my sons, to know about computers. And the sooner you get your kids started, the better off they'll be."

**DWAYNE MURPHY,
Centerfielder,
Oakland A's**

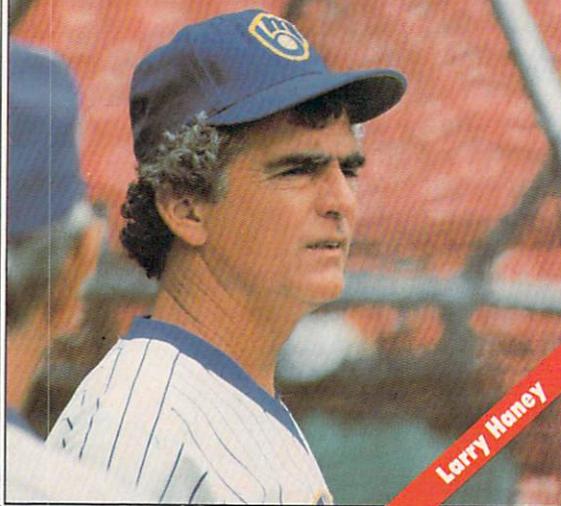
Funny how things happen sometimes. Last summer, Dwayne Murphy, star centerfielder for the Oakland A's, found himself playing less often because the team's computer indicated he wasn't hitting well against certain pitchers or in certain situations. He wasn't happy about the computer having a say in making out the lineup card, and he let club officials know he didn't believe in such an application on the playing field.

But that didn't stop Dwayne and his wife, Brenda, from buying an IBM PC for Christmas last year. "We decided the family needed one," Murphy says. "Our kids use it a lot for learning. They work with subjects like reading, spelling, and word identification, and they also play games."

The Murphys live in Danville, California, outside of Oakland, and they have three children: Dwayne Jr., 12; Scott, 9; and Christina, 4. All three use the computer regularly, and have access to computers at school. "They're definitely getting use out of it," Dwayne says. And it seems to help them with their schoolwork. I'm happy about that."

What about Dwayne? Does he use the PC? "Oh sure. I play the big mystery games. I've finally solved *Deadline* [by Infocom]. I worked it for months . . . Man, I put a lot of hours into it. After solving it, I immediately went out and bought *Infidel* [another adventure

**Star★
Card**



Bullpen coach, Milwaukee Brewers

Married, 41, three children

Uses Apple IIe for baseball statistical analysis. Family uses it for educational programs.

PHOTOGRAPH BY LARRY STODI/TIMMILWAUKEE BREWERS

**Star★
Card**



Centerfielder, Oakland A's

Married, 29, three children

Uses IBM PC to play mystery/adventure games. Kids use educational software and play some games.

PHOTOGRAPH BY MICHAEL ZAKARIS/OAKLAND A'S

game by Infocom). I get up early in the morning when the team's in town and work on the game until about two o'clock when it's time to eat before going out to the ballpark. Using the computer helps me relax; I don't think about anything but solving the mystery."

Last season, a computer caused Dwayne Murphy some anxiety. But what a difference a year makes—this season, he reversed the pattern and used it to stay loose.

ANDREA JAEGER, Tennis Star

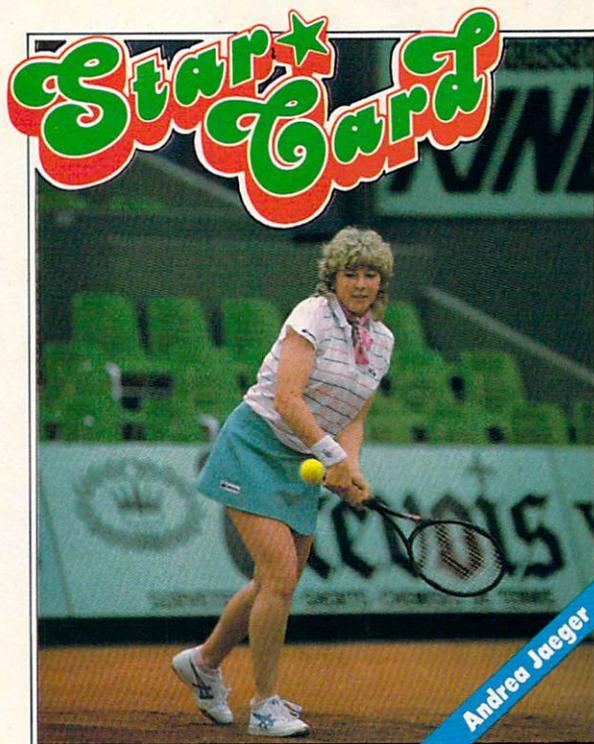
Andrea Jaeger started her professional tennis career at age 14, becoming the youngest player ever to be seeded at Wimbledon. She's won the U.S. Clay Court Championships, played in a Wimbledon final, and twice reached the semifinals of the U.S. Open. Since 1981, she's been one of the top five names in women's tennis. And two years ago, she helped design a five-bedroom home for her family in Largo, Florida, paying for the house with tennis winnings. All of this is hardly the stuff of your typical teenager.

Yet, in some ways, that's all 19-year-old Andrea wants to be: another one of the crowd, wearing shades and listening to Michael Jackson on her Walkman. Her use of a computer brings her a little closer to the normal life that stardom often makes impossible. The computer is her friend; it doesn't ask for an autograph or point a curious finger. Computer time is quiet time.

"I keep personal things on file," she says of her TRS-80, which she keeps in her Florida bedroom. "Things like names, addresses, phone numbers, birthdays. I also write notes to myself." Perhaps not so coincidentally, Andrea is known on the Women's Tennis Association circuit as someone who gives thoughtful gifts to other players and tour officials on special occasions.

Andrea also uses her computer for tennis purposes. She files specific information about good and bad points played in her tournament matches, and she keeps an overall narrative about her reactions to a competition. Before traveling to upcoming tourneys, she reviews her files of impressions and details on opponents and playing sites. Periodically, she phones the WTA offices to receive hard figures and statistical data about her head-to-head successes against certain players.

"When I'm home, I spend at least a couple of hours a day on

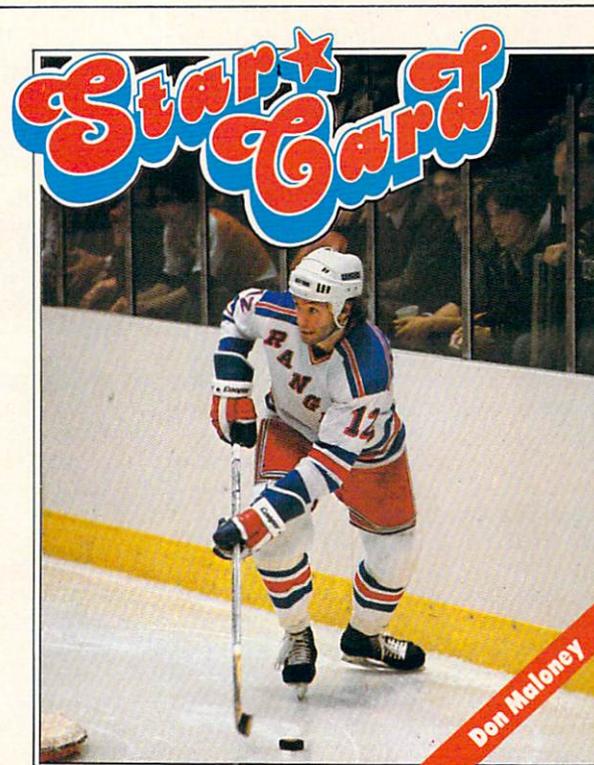


Women's tennis star

Single, 19

Uses TRS-80 for personal record-keeping and organizing. Also to analyze opponents, and her own performance.

PHOTOGRAPH BY CAROL L. NEWSON



Left wing, New York Rangers

Single, 26

Uses Apple IIe for personal finances and word processing.

PHOTOGRAPH: NEW YORK RANGERS

the computer, between personal things and tennis," Andrea says. "And when I get back from the tournaments, I have to catch up on everything."

Last winter, Andrea was forced to sit out three months with a severe case of tendinitis in her right shoulder. She found her computer a comfort. "It kept me company while I was recuperating," she explains. "I really used it a lot."

When she retires from tennis, she plans to go right on using her computer. She also says she'd like to be a CIA agent. Given this, is she already storing information on her computer which she might use to solve an important case some day? "I'll never tell," she says, laughing.

DON MALONEY, Left Wing, New York Rangers

Don Maloney may spend his winters gliding and sliding on the rinks of the National Hockey League, but he's on firmer footing during the summer with his Apple IIe. "I took a course in computers a couple of years ago," explains the Rangers player. "I wanted to get in on the ground floor of the future."

Don, who was the most valuable player in last year's NHL All-Star game, keeps his Apple in the spare bedroom of his condominium in suburban New York. He uses it almost daily during the off-season to monitor his personal finances, help with correspondence, and sometimes just to learn more about computers. "I have *Speed File*, *AppleWriter*, and *VisiCalc*," he says. "I like to keep track of where my money is, what it's doing. The computer makes it a lot easier. I can do things that would take too much time by hand. For instance, *VisiCalc* lets me set up hypothetical real-estate investments; you can ask 'What if?' and the program calculates interest, return on investment, and things like that."

The 26-year-old Lindsay, Ontario, native says that mastering the computer, like learning the finer points of ice hockey, doesn't come easily. "It takes time to understand what are the best-suited uses for your computer," he says, "and you have to have a genuine interest in the computer to gain its full benefits."

What about the other players? Says Don: "Well, a few have gone out and taken a course. But to tell you the truth, most of the guys are more interested in video games." 

BUYER'S GUIDE TO MONITORS

DO YOU NEED ONE? IF SO, WHICH ONE?

BY KEN COACH



Some computer companies advertise that you need only plug their computer into your TV and start computing. And, for many computer owners, that works just fine. But if you're doing serious work with text, numbers, or graphics, you may well be looking for a better way. There is one: a monitor.

Some people can work with a TV for hours without problems, but eyestrain and frustration are all-too-common side effects of using a TV for serious work. That's because TV sets weren't designed to work with computers. They simply don't produce a sharp enough picture or good enough contrast. Sharpness and high contrast really help when you're sitting in front of a screen for long periods of time.

TVs also tend to suffer from interference. That's because the computer's signal doesn't go straight into the TV—it has to be sent through an "RF converter" box, which transmits it into the TV, where it has to compete with whatever stray broadcast signals are floating around.

One other reason many households add a monitor: With a monitor, there's no hassle when you're computing and someone comes along to watch MTV.

FOUR KINDS OF MONITORS

You're likely to encounter four types of computer monitors: monochrome, composite color, RGB, and combination. Here's a description of each:

Monochrome. Monochrome means one color, and that's what you get—usually green or amber against a black background. Amber screens have become popular because many people believe they're easier on the eyes. But there's no real scientific evidence to back that up—it seems to be a matter of personal preference. And amber monitors often cost a bit more than green ones.

Monochrome monitors tend to have quite sharp displays, and they're generally the least expensive—commonly available for less than \$200.

KEN COACH of New York City is a TV producer and a journalist specializing in computer topics.

Composite Color. A composite color monitor is essentially a color TV set that can't pick up TV programs and has been souped up to offer better color and a sharper display. Some offer only slightly better pictures than a typical color TV; others look much better. (It doesn't always depend on price.) Composite color monitors share one major limitation with TV sets: They can't clearly display more than 40 characters per line. Of course, they solve the problem of TV interference. Most cost \$300 to \$400.

RGB. The sharpest color monitors are so-called "RGB" monitors. RGB stands for "red, green, blue," the basic colors all TVs and monitors use to produce a color picture. With RGB monitors, unlike regular TVs and composite color monitors, each of the three primary colors gets its own signal. The result is a much sharper image and more clearly defined color. Many—though not all—RGB monitors can clearly display 80 characters per line.

A GUIDE TO THE CHART

A growing number of companies are offering an increasingly broad variety of monitors. We can't cover them all, so we've listed a representative sample of popular models as a starting point for comparison shopping.

Price: This is the manufacturer's suggested retail price and serves as a guide for comparison only.

Size: Measured diagonally in inches, as with TV sets. A large screen may be better for games, but it is not necessarily better for working with text.

Bandwidth: Measured in megahertz (MHz). The higher the bandwidth, the sharper the edges of the screen image.

Graphics Resolution: Measured in pixels or lines. Either way, the higher the number, the sharper and clearer the monitor.

Character Display: The number of characters that can be displayed. 80×24 or 80×25 is considered standard for serious word-processing or spreadsheet work, but no monitor will display more characters or lines than your computer can produce.

Sound: Does the monitor have sound?

CLOSE-UP: MORE THAN 50 COMPUTER MONITORS

Manufacturer/ Model	Price	Size	Bandwidth	Graphics Resolut.	Charact. Display	Sound
MONOCHROME (Green)						
Amdek Video 300	\$179	12"	18 MHz	960×800	80×25	N
Apple Monitor II	\$229	12"	18 MHz	900 lines	80×25	N
Comrex CR-5400	under \$100	9"	20 MHz	800 lines	80×25	N
Comrex CR-5600	under \$150	12"	20 MHz	1,000 lines	80×25	N
Dynax GM-120	\$199	12"	20 MHz	600 lines	80×25	N
IBM Monochrome Display	\$275	11.5"	16.27 MHz	350×720	80×25	N
Leading Edge Gorilla HRG	\$99	12"	18-22 MHz	800 lines	80×25	N
NEC JB-1270MA	under \$200	12"	NA	800 lines	80×25	N
Panasonic TR-120MIPA	\$220	12"	20 MHz	1,100 lines	80×25	Y
Sakata SG-1000	\$129	12"	18 MHz	900 lines	80×25	N
Sanyo DM2112N	\$118	12"	15 MHz	600 lines	80×25	N
Sharp 12M-15BU	\$199	12"	18 MHz	640×200	80×25	N
Taxan 115	\$169	12"	20 MHz	1,000×262	80×25	N
MONOCHROME (Amber)						
Amdek Video 300A	\$199	12"	18 MHz	960×800	80×25	N
Leading Edge Gorilla HRG	\$110	12"	18-22 MHz	800 lines	80×25	N
Panasonic TR-120MDPA	\$240	12"	20 MHz	1,100 lines	80×25	Y
Sakata SA-1000	\$159	12"	18 MHz	900 lines	80×25	N
Sanyo DM2212N	\$118	12"	15 MHz	600 lines	80×25	N
Sharp 12M-15BUA	\$199	12"	18 MHz	640×200	80×25	N
Taxan 116	\$179	12"	20 MHz	1,000×262	80×25	N
Zenith ZVM-124	\$199	12"	22 MHz	720×350	80×25	N
COMPOSITE						
Amdek 300	\$350	13"	18 MHz	260×300	40×25	Y
Commodore 1702	\$299	13"	NA	320 lines	40×25	Y
Comrex CR-6500	under \$325	13"	10 MHz	260×300	NA	Y
GE Computer Monitor/TV	under \$375	13"	4 MHz	320 lines	60×32	Y
Hitachi CM 1481	\$340	13"	3.7 MHz	260×300	32×24	Y
NEC 1215	\$399	12"	NA	250 lines	40×25	Y
Panasonic CTF-1349M	\$419	13"	7 MHz	380 lines	40×25	Y
Proton 600M	\$650	19"	4.7 MHz	376 lines	40×25	Y
Sakata SC-100	\$329	13"	18 MHz	280×300	40×25	Y
Sanyo DMC5500	\$359	13"	5 MHz	350×350	64×25	Y
Sharp 13M-31U	\$399	13"	3 MHz	280×350	40×25	Y
Taxan 220	\$349	13"	6 MHz	"TV standard"	60×25	Y
RGB						
Apple Color 100	\$599	12"	25 MHz	600 lines	80×25	N
Comrex CR-6600	under \$300	13"	12 MHz	380×240	80×25	N
Comrex CR-6800	under \$650	14"	22 MHz	750×400	80×25	N
Dynax Fortis FC10	\$599	13"	30 MHz	640×200	80×25	N
IBM PC Color Display	\$680	13"	14 MHz	200 vertical	80×25	N
IBM PCjr Color Monitor	\$429	13"	15 MHz	320×200	40×25	Y
Panasonic DT-H103	\$753	10"	15 MHz	760×570	80×25	Y
Princeton HX-12	\$695	12"	15 MHz	690×240	80×25	N
Sakata SC-200	\$649	13"	15 MHz	640×240	80×25	N
Sanyo CRT-70	\$745	12"	18 MHz	640×200	80×25	N
Sharp 12M-22U	\$549	12"	15 MHz	640×200	80×25	N
Taxan 400	\$349	12"	15 MHz	380×262	80×25	N
COMBINATION (bandwidth and character display measured in RGB mode unless specified)						
Amdek 500	\$525	13"	18 MHz	560×240	80×25	Y
Panasonic DTM-140	\$699	14"	15 MHz	350 lines	80×25	Y
Panasonic DT-D1300	\$500	13"	NA	450×240	40×25	Y
Panasonic CTF-1465R	\$719	14"	7 MHz	660 dots	80×25	N
Sanyo DMC6600	\$425	13"	5 MHz	420×240	80×25	Y
*Sanyo CRT-36	\$199	12"	18 MHz**	640×200**	80×25**	N
Sears Model 4084 TV/Monitor	\$340	13"	NA	480 lines	80×25	Y
Sony KX-1901A	\$850	19"	NA	450 lines	80×25	Y
Taxan 210	\$349	12"	6 MHz***	380×262***	40×24***	Y
Teknika MJ-22	\$499	13"	18 MHz	506×240	80×25	Y
Zenith ZVM-135	\$599	13"	20 MHz	640×240	80×25	Y

All specifications provided by manufacturer. NA means specifications were not available. *Black and white/composite only. ** Measured in monochrome. *** Measured in composite.

RGB monitors are expensive; most cost more than \$400. And only a few of the computers sold primarily for home use can be hooked to an RGB monitor without a special interface card. (One that can be is the IBM PCjr.) Others, such as the Apple IIe and IBM PC, will work with an RGB monitor if you add a card. Most inexpensive computers, including Radio Shack, Atari, and Commodore models, generally can't be hooked to an RGB monitor.

Combination. Some newer monitors will work in both composite color and RGB modes, and a few have "color kill" switches to allow a reasonably good monochrome display as well. A few will even work as TVs (although you can now buy a separate tuner, the Taxan TV Tuner 305, which will turn any composite color monitor into a TV).

With the exception of RGB monitors, which may require a special interface card, most monitors are easily connected to most computers. Don't forget to tell your dealer which computer you have, and ask whether the monitor comes with the cable you need.

WHICH KIND FOR ME?

If you know what you want to use your computer for, you'll have a good idea whether you need a monitor, and if so, which one. There will be exceptions, of course, but this chart is a good starting point:

Primary Use	Type of Monitor
Games	TV, or composite color monitor with sound
Graphics/Art	Ideally, an RGB monitor; if not, high-quality composite color
Light word processing or business (40-column display)	Monochrome or high-quality composite color
Heavy word processing or business (80-column display)	Monochrome or high-quality RGB

ABOUT THE PICTURE

The resolution of your screen display starts not in the monitor or TV, but in your computer. It's your computer that determines, for example, how finely the image on your screen can be drawn. More expensive computers such as the IBM PC can produce more highly detailed displays than less-expensive computers like the Atari 800XL and Commodore 64. Before buying a very expensive monitor, make sure your computer can take full advantage of it.

How can you judge a monitor from its specifications? Here are two ways:

1. Bandwidth. This is the rate at which the picture on a screen is drawn, and it's measured in millions of cycles per second (megahertz, or MHz). The higher the bandwidth, the sharper the edges of each letter. TV sets generally have a bandwidth of no more than about 3.8 MHz, which is fine for the evening news, but not very good for computer data. Monitors can have bandwidths of 30 MHz and up.

2. Graphics resolution. The number of dots the screen displays across and down is measured in pixels. For example, a monitor might display 480 x 240 pixels. If a color monitor can display the same or slightly more pixels than your computer, consider buying it. As of now, no inexpensive, home-oriented computer can display more than 320 x 200 pixels. More expensive computers can go higher; the IBM PC and PCjr each display 640 x 200 pixels.

ABOUT SOUND

Unlike TVs, not all monitors come with a speaker and amplifier for producing sound. Though most personal computers can generate sound, they generally need an external speaker and amplifier. If you use your computer

for arcade games or music applications, either make sure your monitor has sound, or be certain you have another way to get sound out of your computer. Two alternatives are to buy a small separate speaker or to hook your computer into your stereo system.

LOOKING AT MONITORS

Choosing a monitor is a highly subjective project. There's no substitute for looking at monitors and judging them for yourself. Here's how.

1. It's best to test the monitor on the same type of computer you're buying it for.

2. Fill the screen with characters. "M"s or "H"s are especially good. Here's a very simple program to do this:

```
10 FOR X=1 TO 2000
20 PRINT "H";
30 NEXT X
RUN
```

3. With the screen full, make sure all characters are clear. If you're testing a color monitor, use the computer's controls to test different background and character colors. Examine the letters closely. Watch out for colored fringes or "halos" around the letters, particularly the ones in the corners. Also watch out for letters that flicker or vibrate. Stand back to make sure the lines of letters don't appear bent at either end of the screen.

4. Clear the screen and move the cursor rapidly across it. If you see a trail or "ghost" of the cursor as it moves, the monitor may not be good for applications that employ rapidly changing images.

5. If possible, load at least one program you'll be using with the monitor, and see how you like the display. If you don't have your own software with you, try the store's demonstration program. Watch the monitor both from close range and from a bit farther away.

6. Move the monitor around to see if it reflects glare from overhead lights. Remember that if the monitor does reflect glare, the store probably located it so as to minimize the problem. If glare is a problem, see if the monitor can be tilted to avoid it. ☐

ADDRESSES:

Amdex Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007; (312) 364-1180. **Apple Computer Inc.**, 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010. **Commodore Computers**, 1200 Wilson Drive, West Chester, PA 19380; (215) 431-9100. **Comrex International**, 3701 Skypark Drive, Suite 120, Torrance, CA 90505; (213) 373-0280. **Dynax**, 6070 Rickenbacker Road, Commerce, CA 90040; (213) 727-1227. **General Electric Video Products Division**, Portsmouth, VA 23705; (800) 626-2000. **Hitachi Sales Corp. of America**, 401 W. Artesia Blvd., Compton, CA 90220; (213) 537-8383. **IBM**, P.O. Box 1328, Boca Raton, FL 33432; (305) 272-2662. **Leading Edge Products**, 21 Highland Circle, Needham Heights, MA 02194; (800) 343-6833. **NEC Electronics**, 1401 Estes Ave., Elk Grove Village, IL 60007; (312) 228-5900. **Panasonic Consumer Division**, 6550 Katella Ave., Cypress, CA 90630; (714) 895-7290. **Panasonic Industrial Co.**, One Panasonic Way, Secaucus, NJ 07094; (800) 222-0584. **Princeton Graphic Systems**, 170 Wall St., Princeton, NJ 08540; (609) 683-1660. **Proton**, 737 W. Artesia Blvd., Compton, CA 90220; (213) 638-5151. **Sakata USA**, 651 Bonnie Lane, Elk Grove Village, IL 60007; (800) 323-6647. **Sanyo Electric, Inc.**, 1200 W. Artesia Blvd., Compton, CA 90220; (213) 537-5830. **Sears, Roebuck & Co.**, Dept. 703-BSC 4015, Sears Tower, Chicago, IL 60684; (312) 875-8306. **Sharp Electronics**, 10 Sharp Plaza, Paramus, NJ 07652; (201) 265-5600. **Sony Consumer Products Co.**, Sony Drive, Park Ridge, NJ 07656; (201) 930-1000. **Taxan Corp.**, 18005 Cortney Court, P.O. Box 8698, City of Industry, CA 91748; (213) 810-1291. **Teknika Electronics Corp.**, 353 Route 46 W., Fairfield, NJ 07006; (201) 575-0380. **Zenith**, 1000 Milwaukee Ave., Glenview, IL 60025; (312) 391-7000.

If you write or call any of the above manufacturers, please let them know you received your information from FAMILY COMPUTING.

ANNOUNCING

FAMILY COMPUTING'S 1ST

"COMPUTING FAMILY OF THE YEAR" CONTEST

GRAND PRIZE:

An exotic family getaway to a
CLUB MED
resort with
computer facility

FIRST PRIZE:

A complete
COMPUTER
system

SECOND PRIZE:

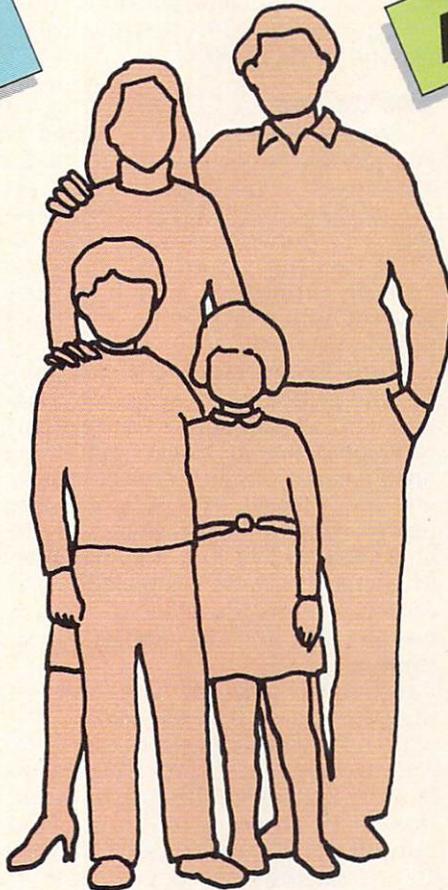
A PRINTER

FOURTH PRIZE:

A MONITOR

THIRD PRIZE:

Awards worth \$250 each—
including modems, graphics
tablets, joysticks, light pens,
software, books, disks, and
computer accessories



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

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

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

1. Describe the most efficient, rewarding, and/or creative ways the family uses its computer. If software is used, tell us which kinds.
2. Explain the ways each family member uses the computer. List their names and ages.
3. Does the family ever use the computer together? To do what?
4. When and why did the family decide to buy a computer? What kind of computer did the family buy?
5. Has the computer lived up to its original expectations? Has its use evolved with time?
6. In what ways has the computer most benefited the family?
7. Do the children use a computer in school? Is the computer at home used for educational purposes? If so, how?

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

CONTEST RULES:

1. You must submit at least 1,000 words, but not more than 2,000. Send typed manuscripts or computer printouts, if possible.
2. Scholastic Inc. employees and advisory-board members, and members of their families, are not eligible.
3. All entries and photographs become the property of Scholastic Inc., which reserves the right to use them in publications and promotions. Unfortunately, Scholastic Inc. will not be able to acknowledge your entries. Entries and photographs will not be returned.

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

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

6. No cash substitutions for prizes.

HOW TO ENTER:

Nominating letters should be mailed to: Suzette Harvey, COMPUTING FAMILY OF THE YEAR CONTEST, c/o FAMILY COMPUTING, Scholastic Inc., 730 Broadway, New York, NY 10003.

Deadline: All entries must be postmarked by March 15, 1985.

Judges: All entries will be judged by a panel of Scholastic employees.

Winners: The winners will be announced in the September 1985 *FAMILY COMPUTING*.

FAMILY COMPUTING

730 Broadway, New York, NY 10003

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

COMMODORE PLUS/4

THIS "PRODUCTIVITY" COMPUTER COMES WITH BUILT-IN SOFTWARE AND A POWERFUL BASIC

BY LOUIS R. WALLACE

EDITOR'S NOTE: This preview of the new Commodore Plus/4 is based on testing a "preproduction" model, one of the first Plus/4s available.

Commodore Business Machines, which claims to have sold more than 2 million VIC-20s and 1 million Commodore 64s, is calling its new Plus/4 computer a "productivity" machine. It's aimed at the 14 million people who run small businesses out of their homes, according to Commodore.

The Plus/4 comes complete with four programs built-in—a word processor, spreadsheet, data base, and graphing program. These programs, called 3-PLUS-1, are "integrated," which means they are designed to share data and even work together on the screen. With 64K of user memory, an excellent extended BASIC, and a moderate price (under \$400), the Plus/4 is a machine that people are going to notice.

KEYBOARD

The Plus/4's keyboard layout is an improvement over the 64's, as it now has two CTRL (control) keys, and a new ESC (escape) key. The eight function keys are still there (on four dual-function keys), except they lie on the top rather than along the side of the keyboard. Four separate cursor-control keys replace two. All of these improvements make the computer easier to use and more powerful.

In the back are various types of connection ports for joysticks (two), cassette-tape recorder, video monitor or TV, disk drives, modem, and printer. There's also a port for plug-in ROM cartridges. Like the C 64, the Plus/4 does not use standard inter-

faces, so that connecting peripherals made by manufacturers other than Commodore requires a special cable or connecting device.

SOFTWARE

When you turn on the computer you get the message: COMMODORE BASIC 3.5 60671 BYTES FREE. You also get the message: 3-PLUS-1 ON KEY F1. Pressing "F1" (function key 1) and RETURN will put you in the word-processing program, which is the gateway into the Plus/4's integrated software system.

Word Processing. The word-processing program is a standard package, with all the expected text-editing functions: it can insert and delete lines, search for and replace words, and move blocks of text. It will also justify, center, and number pages, and allow you to link files together. This link command is absolutely necessary, as you are allowed a maximum of 100 lines in memory at one time.

A problem with the word-processing program is that the screen displays only 40 characters at one time. And though you may scroll sideways to write and view 80-character lines, this can be annoying to the eyes, and difficult to edit—you can't, for instance, see the whole page at once.

The beauty of this integrated software, however, is that at any time you can go from one program to another, without information loss. You can exit the word processor and jump to the spreadsheet with the simple command TC (to computation).

Spreadsheet. Electronic spreadsheets are modeled after accounting sheets, with many rows and columns on which accountants make calculations and keep records. With a spreadsheet you can accomplish tasks as simple as balancing a checkbook, or as complex as handling a payroll. The spreadsheet in the Plus/4 measures 50 rows by 17 columns, or 850 cells. That's enough for most

simple business needs, but it's not unusual to need much more. For example, *Multiplan* for the C 64 has more than 16,000 cells.

One wonderful feature of the 3-PLUS-1 software is that you can have both the word processor and the spreadsheet on the screen at the same time. This is done by using the HA (half-screen) command, and is used when preparing to send data from the spreadsheet to a document already in the word processor. Information from the data base, such as the names and addresses of people or on your mailing lists, can also be transferred to the word processor.

Data base. The data base is called *File Manager*, which is a program to store, search, and retrieve data. It can be accessed by the command TF (to *File Manager*) from either the word processor or the spreadsheet.

A data base stores information in a series of fields, which makes up a record. The *File Manager* allows for a total of 38 characters in each field with 17 fields in each record. And you can have up to 999 different records on a single data disk, enough for most small-business applications. *File Manager* will search for as little as one character, such as all names with an "A."

Graph. Also built-in is a graphing program that takes data from the spreadsheet and automatically creates charts and graphs for you. These graphics are made using character symbols (such as * and =), though not high-resolution graphics or even the special Commodore graphics set, as you might expect. There's method to this madness, however, as the charts can be printed on any printer, dot matrix or daisy wheel—something impossible with high-resolution screens or special character sets.

All four built-in programs are useful, but all have limitations, mostly regarding the amount of data or size of document they can store at one time. These limitations are offset in

LOUIS R. WALLACE, who lives in Gainesville, Florida, is a former president of the Gainesville Commodore Users' Group. His last article was "Buyer's Guide to Disk Drives," in the September issue.

part by the high degree of integration between the programs, and also by the fact that all three can keep information in memory at once.

In addition to the built-in software, Commodore says it is readying 20 more business programs, and some educational and game packages, for the Plus/4. Unfortunately, none but the simplest programs developed for the C 64 will run on the Plus/4 as is—a serious weakness. The C 64 has an extremely large and varied software base. How much better it would have been if the Plus/4 could use C 64 software!

PROGRAMMING

The Plus/4 has got some treats for programmers. It comes with BASIC 3.5, which has all of the C 64's BASIC commands plus an additional 45 commands and statements. The new BASIC commands include disk control statements such as DIRECTORY, COPY, BACKUP, HEADER (to initialize a disk), DLOAD (disk load), and DSAVE (disk save).

You also can program the special function keys with a new statement called KEY that will define the keys as anything you wish. And it also has a JOY command for writing joystick routines into programs. Other commands give the programmer a greater degree of control over a program. These useful commands include DO WHILE, DO UNTIL, and IF . . . THEN . . . ELSE.

Finally, there's a HELP statement that will list a program line with an error and cause that part of the statement to blink.

Along with the other built-in software is TEDMON, a machine-language "monitor" that allows you to write small machine-language programs, or examine and modify memory locations. You cannot do this on most microcomputers without buying an assembler software package. TEDMON comes with its own set of commands, such as A (assemble), D (disassemble), etc.

GRAPHICS/SOUND

The Plus/4 has a 40-column display, definitely a drawback for a business-oriented computer. It has the same Commodore graphics characters as the C 64, and the same 16 text, border, and background colors. However, on the Plus/4 each color can have its luminance individually set at one of eight levels. There are five graphics modes, including "high resolution" and "multicolor high-resolution." To make these graphics easy to

PLUS/4 vs. C 64



The Plus/4 (shown above) costs more than the C 64, runs different software, and is aimed at a home-business market. Even though the Plus/4 is a totally different computer, people still want to know what distinguishes it from the big-selling C 64. Here's a quick checklist.

ADDED FEATURES

- Built-in word-processing, data-base, graphing, and spreadsheet software
- 16 colors, 8 luminances (128 colors)
- "Window" capability
- 45 new BASIC commands and statements to control graphics, sound, etc.
- Four arrow-shaped cursor keys
- Three new keys (ESCAPE, FLASH, and second CONTROL)
- Built-in "monitor" called TEDMON (to write machine-language programs)

OMITTED FEATURES

- Sprite graphics
- Music synthesizer (SID chip)

SHARED FEATURES

- Commodore graphics-character set
- 1541 disk drive, 1702 monitor
- 40-column screen display
- Cartridge port
- 64K user memory

use in programs, the Plus/4 contains over a dozen graphics commands. These include GRAPHIC (mode), COLOR, BOX, CIRCLE, DRAW (line), CHAR (type on high-resolution screen), and PAINT.

While the Plus/4 does not have the sprite graphics that the 64 is famous for, it has added a few special features of its own. One is the FLASH key, which will make any character or statement blink on and off. Another is the ability to define "windows" (small boxes) of any size on the screen, and selectively enter data in them. You can also change the scale of the graphics display by using the SCALE command.

With all these features, some exciting business software may be written for the Plus/4.

The Plus/4 does not have the C 64's legendary music synthesizer (the SID chip), but then again, neither do any other computers. However, the Plus/4

does have two-voice sound and commands to use them. These are the VOL and SOUND commands, which allow you to play limited music or make sound effects. While not as advanced as the C 64 or Atari sound, it's better than that of the TRS-80 Color Computer, VIC-20, or Apple II computers.

PERIPHERALS

The Plus/4 can't use C 64 software, but it can use C 64 hardware. Almost all of the C 64 peripherals will work with the Plus/4. These include the 1541 disk drive, the 1702 color monitor, and Commodore printers.

Beyond this, Commodore says it's developing an entire new line of products for the Plus/4, including the DPS 1101 letter-quality printer (132 columns, 18 characters per second). And there is a new color monitor, the 1802, which is probably a 1702 with a new exterior to match the Plus/4.

DOCUMENTATION

One major drawback to the Plus/4 users' guide is the lack of an index, so that you have to flip through the book to find an answer to a specific problem. For instance, you cannot look up "disk commands," and turn to the given page.

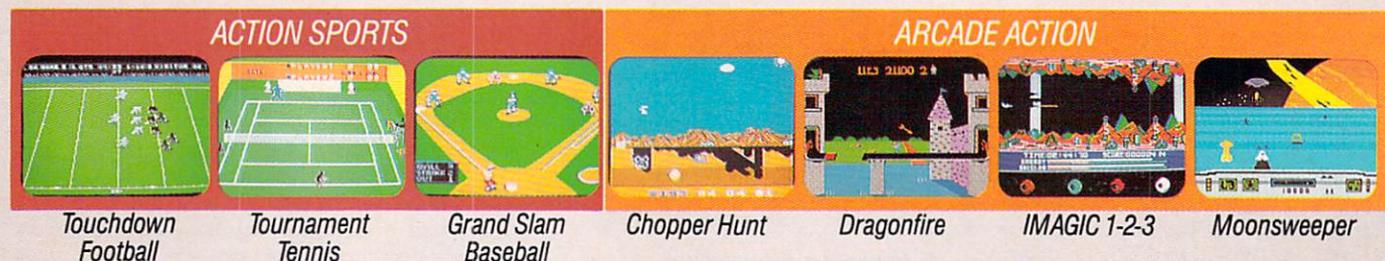
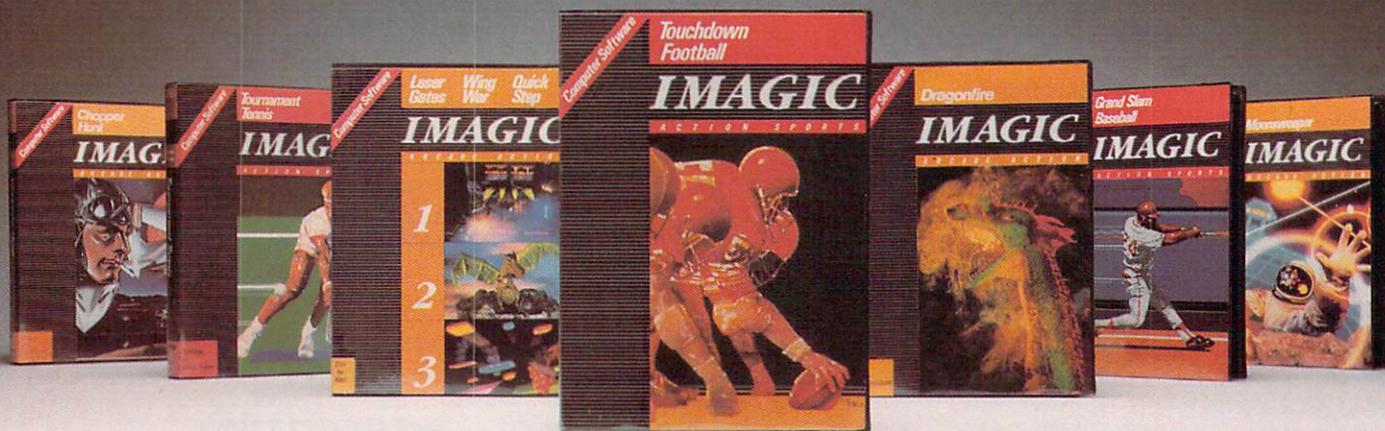
However, the documentation has enough technical information for most users. Each 3-PLUS-1 program has a complete step-by-step tutorial section. Those programmers who wish to dig deep into the machine will have to purchase the *Plus/4 Programmers' Reference Guide*.

SUMMARY

While reviewing the Plus/4, I demonstrated it to several computer users, including dealers. Every one of them agreed it was a remarkable machine. They also agreed that the C 64 could do everything the Plus/4 could, even though several commercial programs, BASIC language extensions, and other utilities (on disk or cartridge) would be required. Even then, some user memory would be lost in the process.

The Commodore Plus/4 is definitely a computer for home- or small-business use, and could provide a lot of help at a very low cost. It can't do what an IBM PC with Lotus 1-2-3 can—but a Plus/4 system will cost significantly less. Were it not for the lack of software, the Plus/4 could hold its own against all computers in its price range, and even some that cost more. As it is, anyone operating a home business on a shoestring would be wise to give it a long look. **FC**

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the PROGRAMMER

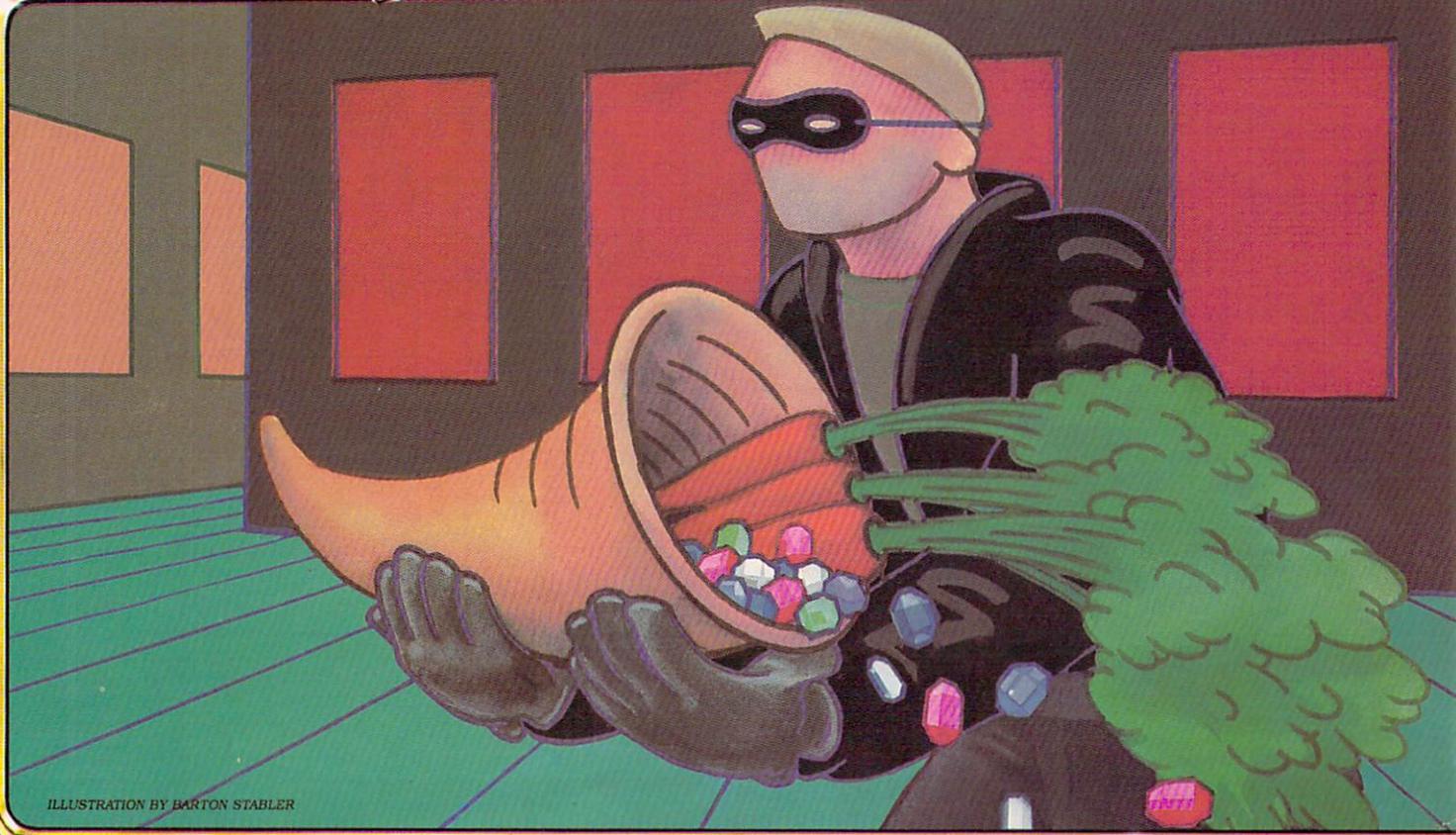


ILLUSTRATION BY BARTON STABLER

★ N O V E M B E R ★

AUTUMN PROGRAMS

Page 75

A personal note to tuck into this year's holiday cards; and a *Cornucopia* overflowing with autumn fruits and vegetables.

PUZZLE

Page 94

A missing gem, a private eye in disguise, some faulty evidence, and an alibi. Can you solve the mystery?

READER-WRITTEN PROGRAM

Page 100

Save time and hassle with our *Mailing List* program. For the Apple.

PROGRAMMING P.S. Page 92 Sorry, we goofed! Corrections and enhancements to previous programs.

ILLUSTRATION BY JIM CHERRY III

Cherry

HOLIDAY UPDATE

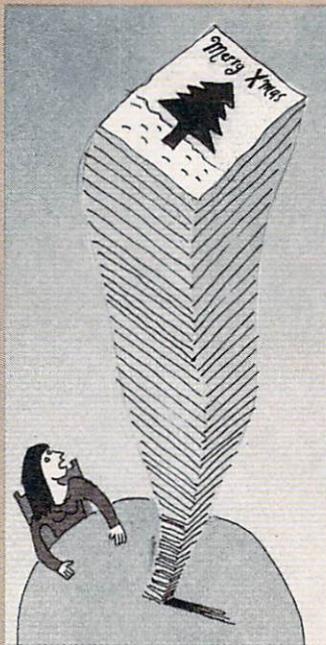
BY JOEY LATIMER

Christmas is just around the corner, but is your stack of unsigned cards still leaning over on your desk like the Tower of Pisa? Do you wring your hands and sigh as you wonder where you'll get the time to jot a personal note in each? After all, you haven't seen the Kendalls or the Smiths in over a year, and they'd love to hear what's new with your family.

Now your computer can help ease your workload with this personalized year-end summary note that can be inserted into your holiday card or mailed separately. All you have to do is hook up your printer, RUN the program, and enter some information.

Each member of your family (12 maximum) will be asked to input their most unusual, difficult, rewarding, and pleasurable experiences of 1984. Then you'll be asked to specify the holiday (Christmas, Chanukah, etc.) and, last of all, to type in the name of the note's recipient. Position your printer to start printing at the top of the page and press "P" to print the note. You can print as many copies as you wish, naming a new recipient each time. When you've finished, press "Q" to quit, and head for the nearest mailbox!

Version notes: As shown



here, *Holiday Update* will center your message vertically on standard 8½-inch × 11-inch paper, which is 66 lines deep. Depending on the number of lines in your message, you may be able to modify the program to use paper of a different length by changing the value of variable "s" (set initially to 66) in line 30. Try changing "s" to 48 so that the program works with 5-inch × 8-inch paper, or experiment with different settings of your own.

The TI-99/4A version of *Holiday Update* is set up to work with a parallel printer. If you have a serial printer, change line 590 to read OPEN #1: "RS232".

ADAM & Apple/Holiday Update

```

10 HOME
30 S = 66
40 PRINT "*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE QUESTIONS."
70 PRINT "PRESS <RETURN> AFTER"
80 PRINT "EACH REPLY."
90 PRINT
100 INPUT "WHAT IS YOUR LAST NAME?";NS
110 PRINT
120 PRINT "HOW MANY PEOPLE AND PETS ARE"
130 PRINT "IN THE ";NS;" FAMILY";
140 INPUT HM
150 IF HM > 12 THEN PRINT "I CAN ONLY HANDLE 12 NAMES
.":GOTO 110
    
```

```

160 DIM P$(HM),L$(HM,4)
170 PRINT
180 PRINT "ENTER THE NAME OF EACH"
190 PRINT NS;" FAMILY MEMBER. IF IT'S"
200 PRINT "A PET, BE SURE TO SAY"
210 PRINT "WHAT KIND (E.G., RAGS THE DOG)."

```

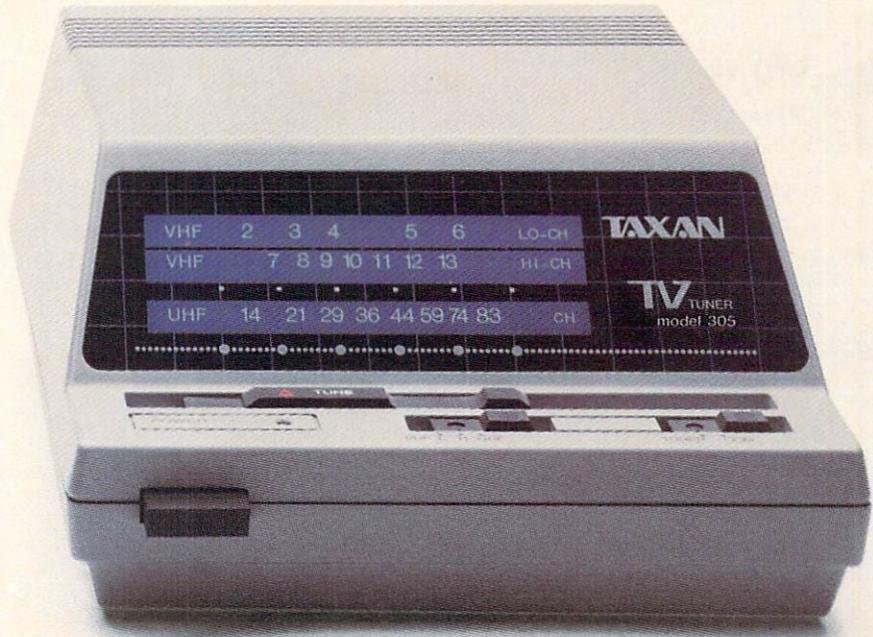
A partial list of programs now available on your composite monitor.

60 Minutes. Hill Street Blues. Magnum P.I. You see, with TAXAN's new TV tuner, you can turn your composite monitor into a television set. A set with the better color and quality unique to computer monitors.

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THE ONE TO WATCH

AUTUMN PROGRAMS

Atari/Holiday Update

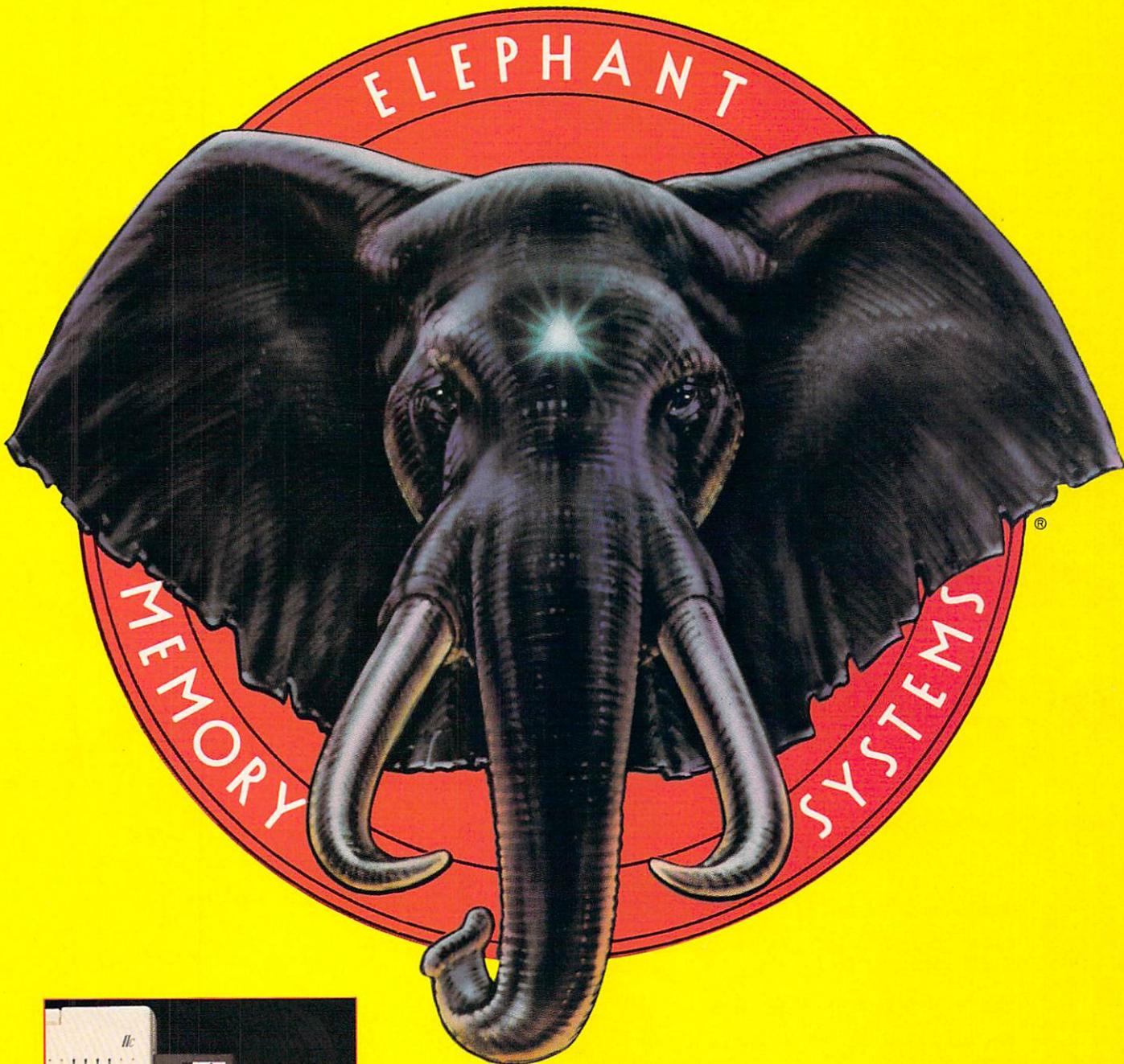
```
10 DIM A$(38),F$(38),H$(38),N$(38),T$(11)
20 OPEN #1,4,0,"K:"
30 S=66
40 PRINT CHR$(125);
50 PRINT "*HOLIDAY UPDATE*"
60 PRINT
70 PRINT "PLEASE ANSWER THE QUESTIONS."
80 PRINT "PRESS <RETURN> AFTER EACH REPLY."
90 PRINT
100 PRINT "WHAT IS YOUR LAST NAME?";
110 INPUT N$
120 PRINT
130 PRINT "HOW MANY PEOPLE AND PETS ARE"
140 PRINT "IN THE ";N$;" FAMILY?";
150 TRAP 150
160 INPUT HM
170 TRAP 40000
180 IF HM>12 THEN PRINT "I CAN ONLY HANDLE 12 NAMES.":
GOTO 120
190 DIM P$(HM*38),L$(HM*152),PP(HM,1),LP(HM,4),LL(HM,4)
200 PRINT
210 PRINT "ENTER THE NAME OF EACH"
220 PRINT N$;" FAMILY MEMBER. IF IT'S"
230 PRINT "A PET, BE SURE TO SAY"
240 PRINT "WHAT KIND (E.G., RAGS THE DOG)."
```

```
250 PRINT
260 FOR X=1 TO HM
270 PRINT N$;" #";X;
280 INPUT A$
290 IF A$="" THEN A$=" "
300 PP(X,0)=LEN(P$)+1
310 P$(PP(X,0))=A$
320 PP(X,1)=LEN(P$)
330 NEXT X
340 FOR T=1 TO 4
350 READ T$
360 FOR X=1 TO HM
370 PRINT CHR$(125);
380 PRINT "IN TWO SCREEN LINES OR LESS,"
390 PRINT "DESCRIBE THE MOST ";T$
400 PRINT "THING THAT ";P$(PP(X,0)),PP(X,1))
410 PRINT "DID IN 1984."
420 PRINT "PRESS <RETURN> WHEN DONE."
430 PRINT
440 PRINT P$(PP(X,0)),PP(X,1));" ";
450 INPUT A$
460 IF A$="" THEN A$=" "
470 LP(X,T)=LEN(L$)+1
480 L$(LP(X,T))=A$
490 LL(X,T)=LEN(L$)
500 NEXT X
510 NEXT T
520 PRINT CHR$(125);
530 PRINT "WHAT IS THE HOLIDAY?"
540 PRINT "(E.G., CHRISTMAS)?"
550 PRINT
560 PRINT "THE HOLIDAY IS ";
570 INPUT H$
580 PRINT
590 PRINT "WHO IS THIS NOTE FOR?"
600 PRINT "(E.G., SMITH FAMILY, DEBBIE)?"
610 PRINT
620 INPUT F$
630 PRINT CHR$(125);
640 PRINT "WHEN YOUR PRINTER IS READY,"
650 PRINT "PLEASE PRESS ANY KEY.:"
660 GET #1,K
670 FOR X=1 TO (S-14-HM*4)/2
680 LPRINT
690 NEXT X
700 LPRINT "DEAR ";F$;" ,"
710 LPRINT
720 LPRINT "HERE'S A LIST TO TELL YOU MORE"
```

Commodore 64 & VIC-20/Holiday Update

```
10 PRINT CHR$(147);
30 S=66
40 PRINT "*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE"
70 PRINT "QUESTIONS. PRESS"
80 PRINT "<RETURN> AFTER EACH"
90 PRINT "REPLY."
100 PRINT
110 PRINT "WHAT IS YOUR LAST NAME?"
120 INPUT N$
130 PRINT
140 PRINT "HOW MANY PEOPLE AND"
150 PRINT "PETS ARE IN THE"
160 PRINT N$;" FAMILY?";
170 INPUT HM
180 IF HM>12 THEN PRINT "I CAN ONLY HANDLE":PRINT "12
NAMES.":GOTO 130
190 DIM P$(HM),L$(HM,4)
200 PRINT
210 PRINT "ENTER THE NAME OF"
220 PRINT "EACH FAMILY MEMBER."
230 PRINT "IF IT'S A PET, BE"
240 PRINT "SURE TO SAY WHAT KIND"
250 PRINT "(E.G., RAGS THE DOG)."
```

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AUTUMN PROGRAMS

```
460 PRINT "(E.G., CHRISTMAS)?"
470 PRINT
480 PRINT "THE HOLIDAY IS ..."
490 INPUT HS
500 PRINT
510 PRINT "WHO IS THIS NOTE"
520 PRINT "FOR (E.G., DEBBIE,"
530 PRINT "SMITH FAMILY)?"
540 PRINT
550 INPUT FS
560 PRINT CHR$(147);
570 PRINT "WHEN YOUR PRINTER"
580 PRINT "IS READY, PLEASE"
590 PRINT "PRESS ANY KEY."
600 GET KS
610 IF KS="" THEN 600
620 OPEN 4,4
630 CMD4
640 FOR X=1 TO (S-14-HM*4)/2
650 PRINT
660 NEXT X
670 PRINT "DEAR ";FS;","
680 PRINT
690 PRINT "HERE'S A LIST TO TELL YOU MORE"
700 PRINT "OF WHAT WE DID IN '84:"
710 PRINT
720 PRINT
730 FOR T=1 TO 4
740 FOR X=1 TO HM
750 PRINT P$(X);" ";L$(X,T)
760 NEXT X,T
770 PRINT
780 PRINT
790 PRINT "HAVE A WONDERFUL ";HS;" HOLIDAY!"
800 PRINT
810 PRINT
820 PRINT "LOVE,"
830 PRINT
840 PRINT TAB(3);"THE ";NS;" FAMILY"
850 FOR X=1 TO (S-14-HM*4)/2
860 PRINT
870 NEXT X
880 PRINT#4
890 CLOSE 4
900 PRINT CHR$(147);
910 PRINT "PRESS <Q> TO QUIT"
920 PRINT "OR <P> TO PRINT"
930 PRINT "ANOTHER NOTE."
940 GET KS
950 IF KS="Q" THEN PRINT CHR$(147);:END
960 IF KS="P" THEN PRINT CHR$(147);:GOTO 510
970 GOTO 940
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

IBM PCs/Holiday Update

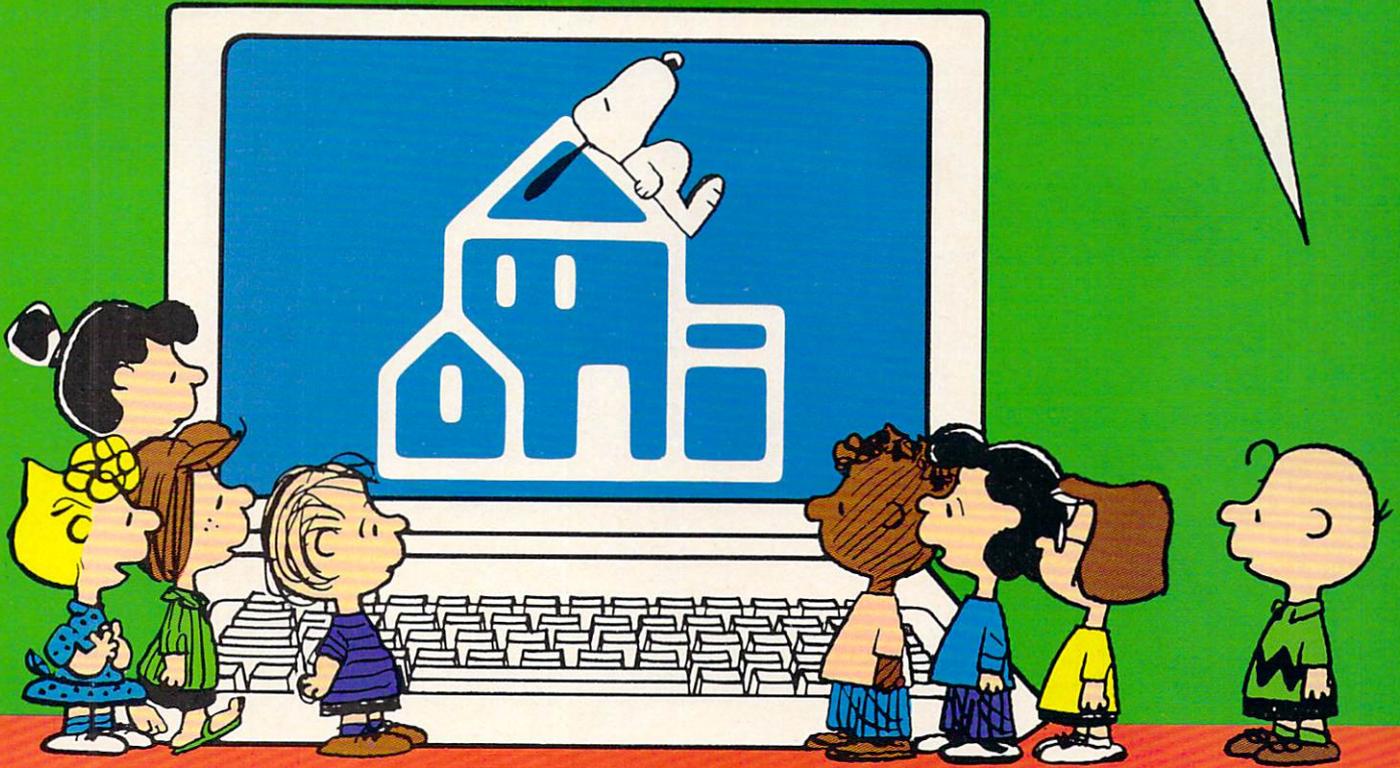
```
10 WIDTH 40
20 CLS
30 S=66
40 PRINT TAB(10);"*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE QUESTIONS."
70 PRINT "PRESS <ENTER> AFTER EACH REPLY."
80 PRINT
90 INPUT "WHAT IS YOUR LAST NAME";NS
100 PRINT
110 PRINT "HOW MANY PEOPLE AND PETS ARE IN THE"
120 PRINT NS;" FAMILY";
130 INPUT HM
140 IF HM>12 THEN PRINT "I CAN ONLY HANDLE 12 NAMES.":
GOTO 100
150 DIM P$(HM),L$(HM,4)
160 PRINT
170 PRINT "ENTER THE NAME OF EACH ";NS
180 PRINT "FAMILY MEMBER. IF IT'S A PET, BE SURE"
190 PRINT "TO SAY WHAT KIND (E.G., RAGS THE DOG)."
```

```
210 FOR X=1 TO HM
220 PRINT NS;" #";X;
230 INPUT P$(X)
240 NEXT X
250 FOR T=1 TO 4
260 READ TS
270 FOR X=1 TO HM
280 CLS
290 PRINT "IN TWO SCREEN LINES OR LESS, DESCRIBE"
300 PRINT "THE MOST ";TS;" THING THAT ";P$(X)
310 PRINT "DID IN 1984. PRESS <ENTER> WHEN DONE."
320 PRINT
330 PRINT P$(X);" ";
340 INPUT L$(X,T)
350 NEXT X,T
360 CLS
370 PRINT "WHAT IS THE HOLIDAY"
380 PRINT "(E.G., CHRISTMAS)?"
390 PRINT
400 INPUT "THE HOLIDAY IS ";HS
410 PRINT
420 PRINT "WHO IS THIS NOTE FOR"
430 PRINT "(E.G., SMITH FAMILY, DEBBIE)?"
440 PRINT
450 INPUT FS
460 CLS
470 PRINT "WHEN PRINTER IS READY,"
480 PRINT "PLEASE PRESS ANY KEY."
490 KS=INKEY$
500 IF KS="" THEN 490
510 FOR X=1 TO (S-14-HM*4)/2
520 LPRINT
530 NEXT X
540 LPRINT "DEAR ";FS;","
550 LPRINT
560 LPRINT "HERE'S A LIST TO TELL YOU MORE"
570 LPRINT "OF WHAT WE DID IN '84:"
580 LPRINT
590 LPRINT
600 FOR T=1 TO 4
610 FOR X=1 TO HM
620 LPRINT P$(X);" ";L$(X,T)
630 NEXT X,T
640 LPRINT
650 LPRINT
660 LPRINT "HAVE A WONDERFUL ";HS;" HOLIDAY!"
670 LPRINT
680 LPRINT
690 LPRINT "LOVE,"
700 LPRINT
710 LPRINT TAB(3);"THE ";NS;" FAMILY"
720 FOR X=1 TO (S-14-HM*4)/2
730 LPRINT
740 NEXT X
750 CLS
760 PRINT "PRESS <Q> TO QUIT"
770 PRINT "OR <P> TO PRINT ANOTHER NOTE."
780 KS=INKEY$
790 IF KS="Q" OR KS="q" THEN CLS:END
800 IF KS="P" OR KS="p" THEN CLS:GOTO 420
810 GOTO 780
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

TI-99/4A/Holiday Update

```
10 CALL CLEAR
20 DIM P$(12),L$(12,4)
30 S=66
40 PRINT TAB(6);"*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE"
70 PRINT "QUESTIONS. PRESS <ENTER>"
80 PRINT "AFTER EACH REPLY."
90 PRINT
100 PRINT "WHAT IS YOUR"
110 INPUT "LAST NAME? ";NS
120 PRINT
```

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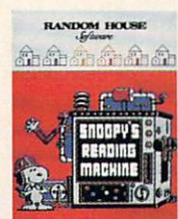
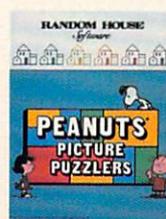
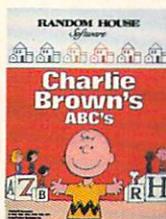
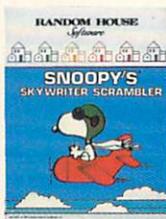
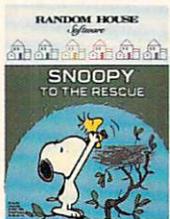
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†For Apple II+, IIe, IIc. Soon for Commodore 64—disk drive only. (Trademarks of Apple Computer, Inc. & Commodore Electronics Ltd.) © 1984 Random House, Inc. All rights reserved.

AUTUMN PROGRAMS

```
130 PRINT "HOW MANY PEOPLE AND"
140 PRINT "PETS ARE IN THE"
150 PRINT N$;" FAMILY";
160 INPUT HM
170 IF HM<=12 THEN 200
180 PRINT "I CAN ONLY HANDLE 12 NAMES."
190 GOTO 120
200 PRINT
210 PRINT "ENTER THE NAME OF EACH"
220 PRINT "FAMILY MEMBER. IF IT'S A"
230 PRINT "PET, BE SURE TO SAY WHAT"
240 PRINT "KIND (E.G., RAGS THE DOG)."
```

```
890 CALL KEY(3,K,ST)
900 IF (K=81)+(K=113)THEN 940
910 IF (K<>80)*(K<>112)THEN 890
920 CALL CLEAR
930 GOTO 500
940 CALL CLEAR
950 END
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Holiday Update

```
30 LET S=66
40 DIM T$(4,11)
50 LET T$(1)="UNUSUAL"
60 LET T$(2)="DIFFICULT"
70 LET T$(3)="REWARDING"
80 LET T$(4)="PLEASURABLE"
90 PRINT TAB 8;"*HOLIDAY UPDATE*"
100 PRINT
110 PRINT "PLEASE ANSWER THE QUESTIONS."
120 PRINT "PRESS <ENTER> AFTER EACH REPLY."
130 PRINT
140 PRINT "WHAT IS YOUR LAST NAME?"
150 INPUT N$
160 PRINT
170 PRINT "HOW MANY PEOPLE AND PETS ARE"
180 PRINT "IN THE ";N$;" FAMILY?"
190 INPUT HM
200 IF HM<=12 THEN GOTO 230
210 PRINT "I CAN ONLY HANDLE 12 NAMES."
220 GOTO 160
230 DIM P$(HM,20)
240 DIM L$(HM,4,80)
250 LET S=(S-15-HM*4)/2
260 CLS
270 PRINT "ENTER THE NAME OF EACH"
280 PRINT N$;" FAMILY MEMBER. IF IT"
290 PRINT "IS A PET, BE SURE TO SAY WHAT"
300 PRINT "KIND (E.G., RAGS THE DOG)."
```



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AUTUMN PROGRAMS

```
670 PRINT
680 PRINT "WHO IS THIS NOTE FOR"
690 PRINT "(E.G., SMITH FAMILY, DEBBIE)?"
700 INPUT F$
710 CLS
720 PRINT "WHEN YOUR PRINTER IS READY,"
730 PRINT "PLEASE PRESS ANY KEY."
740 IF INKEY$="" THEN GOTO 740
750 FOR X=1 TO S
760 LPRINT
770 NEXT X
780 LPRINT "DEAR ";F$;","
790 LPRINT
800 LPRINT "HERE IS A LIST TO TELL YOU MORE"
810 LPRINT "OF WHAT WE DID IN EIGHTY-FOUR:"
820 LPRINT
830 LPRINT
840 FOR T=1 TO 4
850 FOR X=1 TO HM
860 LPRINT P$(X, TO CODE P$(X,20));" ";L$(X,T, TO CO
DE (L$(X,T,80)))
870 NEXT X
880 NEXT T
890 LPRINT
900 LPRINT
910 LPRINT "HAVE A WONDERFUL ";H$
920 LPRINT "HOLIDAY."
930 LPRINT
940 LPRINT
950 LPRINT "LOVE,"
960 LPRINT
970 LPRINT TAB 3;"THE ";N$;" FAMILY"
980 FOR X=1 TO S
990 LPRINT
1000 NEXT X
1010 CLS
1020 PRINT "PRESS <Q> TO QUIT"
1030 PRINT "OR <P> TO PRINT ANOTHER NOTE."
1040 LET K$=INKEY$
1050 IF K$="Q" THEN GOTO 1090
1060 IF K$("<"P" THEN GOTO 1040
1070 CLS
1080 GOTO 680
1090 CLS
1100 STOP
```

TRS-80 Color Computer/Holiday Update

```
10 CLS
20 CLEAR 5000
30 S=66
40 PRINT TAB(5);"*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE QUESTIONS."
70 PRINT "PRESS <RETURN> AFTER"
80 PRINT "EACH REPLY."
90 PRINT
100 INPUT "WHAT IS YOUR LAST NAME";N$
110 PRINT
120 PRINT "HOW MANY PEOPLE AND PETS ARE"
130 PRINT "IN THE ";N$;" FAMILY";
140 INPUT HM
150 IF HM>12 THEN PRINT "I CAN ONLY HANDLE 12 NAMES."
:GOTO 110
160 DIM P$(HM),L$(HM,4)
170 PRINT
180 PRINT "ENTER THE NAME OF EACH"
190 PRINT N$;" FAMILY MEMBER. IF IT'S"
200 PRINT "A PET, BE SURE TO SAY"
210 PRINT "WHAT KIND (E.G., RAGS THE DOG)."
```

```
220 PRINT
230 FOR X=1 TO HM
240 PRINT N$;" #";X;
250 INPUT P$(X)
260 NEXT X
270 FOR T=1 TO 4
280 READ T$
290 FOR X=1 TO HM
```

```
300 CLS
310 PRINT "IN TWO SCREEN LINES OR LESS,"
320 PRINT "DESCRIBE THE MOST ";T$
330 PRINT "THING THAT ";P$(X)
340 PRINT "DID IN 1984."
350 PRINT "PRESS <RETURN> WHEN DONE."
360 PRINT
370 PRINT P$(X);" ";
380 INPUT L$(X,T)
390 NEXT X,T
400 CLS
410 PRINT "WHAT IS THE HOLIDAY"
420 PRINT "(E.G., CHRISTMAS)?"
430 PRINT
440 INPUT "THE HOLIDAY IS ";H$
450 PRINT
460 PRINT "WHO IS THIS NOTE FOR"
470 PRINT "(E.G., SMITH FAMILY, DEBBIE)?"
480 PRINT
490 INPUT F$
500 CLS
510 PRINT "WHEN YOUR PRINTER IS READY,"
520 PRINT "PLEASE PRESS ANY KEY."
530 K$=INKEY$
540 IF K$="" THEN 530
550 FOR X=1 TO (S-14-HM*4)/2
560 PRINT#-2
570 NEXT X
580 PRINT#-2,"DEAR ";F$;","
590 PRINT#-2
600 PRINT#-2,"HERE'S A LIST TO TELL YOU MORE"
610 PRINT#-2,"OF WHAT WE DID IN '84:"
620 PRINT#-2
630 PRINT#-2
640 FOR T=1 TO 4
650 FOR X=1 TO HM
660 PRINT#-2,P$(X);" ";L$(X,T)
670 NEXT X,T
680 PRINT#-2
690 PRINT#-2
700 PRINT#-2,"HAVE A WONDERFUL ";H$;" HOLIDAY!"
710 PRINT#-2
720 PRINT#-2
730 PRINT#-2,"LOVE,"
740 PRINT#-2
750 PRINT#-2,TAB(3);"THE ";N$;" FAMILY"
760 FOR X=1 TO (S-14-HM*4)/2
770 PRINT#-2
780 NEXT X
790 CLS
800 PRINT "PRESS <Q> TO QUIT"
810 PRINT "OR <P> TO PRINT ANOTHER NOTE."
820 K$=INKEY$
830 IF K$="Q" THEN CLS:END
840 IF K$="P" THEN CLS:GOTO 460
850 GOTO 820
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

TRS-80 Model III/Holiday Update

```
10 CLEAR 5000
20 CLS
30 S=66
40 PRINT TAB(20);"*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE QUESTIONS. PRESS <ENTER> A
FTER EACH REPLY."
70 PRINT
80 INPUT "WHAT IS YOUR LAST NAME";N$
90 PRINT
100 PRINT "HOW MANY PEOPLE AND PETS ARE IN THE ";N$;"
FAMILY";
110 INPUT HM
120 IF HM>12 THEN PRINT "I CAN ONLY HANDLE 12 NAMES.":
GOTO 90
130 DIM P$(HM),L$(HM,4)
140 PRINT
150 PRINT "ENTER THE NAME OF EACH ";N$;" FAMILY MEMBER
```

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AUTUMN PROGRAMS

```

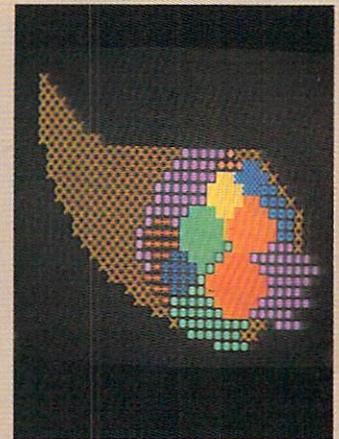
IF IT'S"
160 PRINT "A PET, BE SURE TO SAY WHAT KIND (E.G., RAGS
THE DOG)."
170 PRINT
180 FOR X=1 TO HM
190 PRINT NS;" #";X;
200 INPUT PS(X)
210 NEXT X
220 FOR T=1 TO 4
230 READ TS
240 FOR X=1 TO HM
250 CLS
260 PRINT "IN ONE SCREEN LINE OR LESS, DESCRIBE THE MO
ST ";TS
270 PRINT "THING THAT ";PS(X);" DID IN 1984. PRESS <E
NTER> WHEN DONE."
280 PRINT
290 PRINT PS(X);" ";
300 INPUT LS(X,T)
310 NEXT X,T
320 CLS
330 PRINT "WHAT IS THE HOLIDAY (E.G., CHRISTMAS)?"
340 PRINT
350 INPUT "THE HOLIDAY IS ";HS
360 PRINT
370 INPUT "WHO IS THIS NOTE FOR (E.G., SMITH FAMILY, D
EBBIE)";FS
380 CLS
390 PRINT "WHEN YOUR PRINTER IS READY, PLEASE PRESS AN
Y KEY."
400 KS=INKEY$
410 IF KS="" THEN 400
420 FOR X=1 TO (S-14-HM*4)/2
430 LPRINT
440 NEXT X
450 LPRINT "DEAR ";FS;" ,"
460 LPRINT
470 LPRINT "HERE'S A LIST TO TELL YOU MORE"
480 LPRINT "OF WHAT WE DID IN '84:"
490 LPRINT
500 LPRINT
510 FOR T=1 TO 4
520 FOR X=1 TO HM
530 LPRINT PS(X);" ";LS(X,T)
540 NEXT X,T
550 LPRINT
560 LPRINT
570 LPRINT "HAVE A WONDERFUL ";HS;" HOLIDAY!"
580 LPRINT
590 LPRINT
600 LPRINT "LOVE,"
610 LPRINT
620 LPRINT TAB(3);"THE ";NS;" FAMILY"
630 FOR X=1 TO (S-14-HM*4)/2
640 LPRINT
650 NEXT X
660 CLS
670 PRINT "PRESS <Q> TO QUIT OR <P> TO PRINT ANOTHER N
OTE."
680 KS=INKEY$
690 IF KS="Q" OR KS="q" THEN CLS:END
700 IF KS="P" OR KS="p" THEN CLS:GOTO 370
710 GOTO 680
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE

```

CORNUCOPIA

BY JOEY LATIMER

While you're decorating the house this Thanksgiving in preparation for the relatives' arrival, don't overlook your computer! After you've hung the dried corn ears on the front door and created a table centerpiece of pumpkins and gourds, RUN this program and watch that age-old symbol of abundance, the cornucopia, appear on your screen, overflowing with autumn fruits and vegetables!



Commodore 64 version of Cornucopia.

ADAM & Apple/Cornucopia

```

9 REM --CLEAR SCREEN AND SET FOR GRAPHICS--
10 HOME
20 GR
29 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
30 FOR X = 1 TO 10
40 READ KO,F,T
50 COLOR= KO
60 FOR RO = F TO T
70 READ A,B
80 HLINE A,B AT RO
90 NEXT RO,X
99 REM --DRAW DETAILED AND IRREGULAR PARTS--
100 FOR X = 1 TO 3
110 READ KO,T
120 COLOR= KO
130 FOR Y = 1 TO T
140 READ CO,RO
150 PLOT CO,RO
160 NEXT Y,X
170 GOTO 170
1000 DATA 13,1,33,3,3,3,4,3,5,3,6,3,7,3,8,3,9
1010 DATA 3,10,4,11,4,12,4,14,4,17,4,26,5,27
1020 DATA 5,28,5,29,6,30,6,31,7,31,7,32,7,32
1030 DATA 8,32,8,32,9,32,9,32,10,31,10,31,11,31
1040 DATA 12,17,13,17,15,17,16,19,18,26
1050 DATA 1,14,34,21,23,20,22,19,22,18,21
1060 DATA 17,19,17,18,16,17,16,17,16,23
1070 DATA 16,23,16,24,16,24,17,25,17,26
1080 DATA 17,26,18,26,18,26,18,25,20,25
1090 DATA 21,24,22,23
1100 DATA 12,14,22,24,26,23,27,23,28,22,29
1110 DATA 22,28,23,27,24,28,24,27,24,25
1120 DATA 3,20,35,31,31,28,31,26,31,24,31
1130 DATA 25,31,25,31,26,30,27,30,27,30
1140 DATA 27,31,27,32,26,31,26,32,27,31,28,30
1150 DATA 29,29,11,18,23,20,21,19,22,18,23,18,23,19
1160 DATA 22,20,21,3,24,26,18,19,17,20,18,19
1170 DATA 13,16,19,25,26,24,27,24,27,25,26
1180 DATA 11,18,20,29,30,28,30,29,30
1190 DATA 9,22,25,27,28,26,29,26,29,27,28
1200 DATA 12,26,31,22,24,21,25,21,25,21,25,22
1210 DATA 24,23,23,2,21,27,27,29,28,27,29,28
1220 DATA 30,30,30,26,31,31,31,28,32,30,33
1230 DATA 33,33,28,34,31,35,29,21,31,21,24
1240 DATA 23,30,23,25,25,31,25,29,26,33,36,28,37
1250 DATA 3,5,35,35,27,36,32,36,30,37,32,38
1260 DATA 9,13,17,27,18,29,20,29,19,31,21,30
1270 DATA 21,32,23,33,22,34,24,35,23,36,21,36
1280 DATA 25,37,16,23

```

Apple IIe/c • Atari
Commodore 64
IBM PCjr

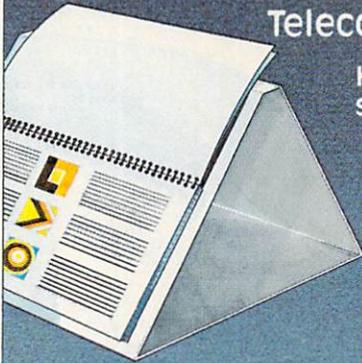
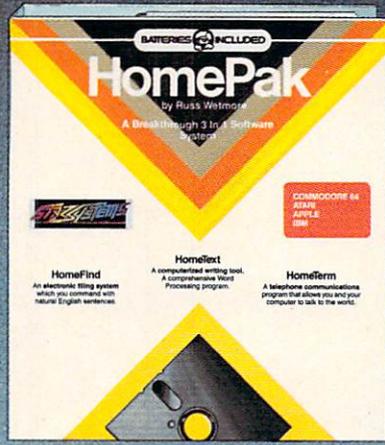
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AUTUMN PROGRAMS

Atari/Cornucopia

```
9 REM --RESERVE SPACE IN HIGH MEMORY--
10 S=(PEEK(106)-4)*256
20 POKE 106,S/256
30 GRAPHICS 17
39 REM --REDEFINE CHARACTERS A THROUGH I--
40 FOR X=S+264 TO S+335
50 READ SH
60 POKE X,SH
70 NEXT X
79 REM --RESET CHARACTER SET POINTER--
80 POKE 756,S/256
89 REM --MAIN DRAWING LOOP--
90 FOR X=1 TO 20
100 READ KO,F,T
110 COLOR KO
120 FOR RO=F TO T
130 READ A,B
140 PLOT A,RO
150 DRAWTO B,RO
160 NEXT RO
170 NEXT X
179 REM --WAIT FOR KEYPRESS--
180 POKE 764,255
189 REM --IF KEY IS PRESSED, RETURN SYSTEM TO NORMAL--
190 IF PEEK(764)<>255 THEN POKE 756,224:GRAPHICS 0:END
200 GOTO 190
1000 DATA 197,231,125,60,60,125,231,197,0,60,126,126
1010 DATA 126,126,60,0,60,126,255,255,255,255,126,60
1020 DATA 168,1,148,33,148,1,84,34,3,15,31,63,127,127
1030 DATA 255,255,192,240,248,252,254,254,255,255,255
1040 DATA 255,127,127,63,31,15,3,255,255,254,254,252
1050 DATA 248,240,192,255,255,255,255,255,255,255,255
1060 DATA 65,0,22,0,0,0,1,0,2,0,3,0,4,1,5,1,13,1,14,2
1070 DATA 15,2,16,2,16,2,17,3,17,3,17,4,17,4,17,5,17
1080 DATA 5,17,6,17,6,7,7,7,8,15,11,12,226,11,23,14
1090 DATA 14,13,14,13,16,13,15,13,14,8,8,8,8,8,9,8,10
1100 DATA 8,13,9,14,13,14,14,15,194,7,23,11,11,10,11
1110 DATA 10,11,9,13,8,13,8,11,8,8,8,8,8,8,8,9,12
1120 DATA 10,12,10,15,14,16,15,17,15,17,17,18,99,8,23
1130 DATA 14,14,14,15,14,15,15,16,15,16,15,15,16,16
1140 DATA 15,16,16,16,16,16,15,17,16,17,17,17,9,10,10
1150 DATA 10,11,11,68,12,23,12,12,11,12,11,12,11,13
1160 DATA 11,12,10,11,10,10,10,10,9,9,9,10,9,10,10,11
1170 DATA 233,8,8,12,13,105,13,15,9,10,9,10,9,10,73
1180 DATA 16,18,14,14,13,15,14,14,229,7,7,12,12,101
1190 DATA 12,12,9,9,69,16,16,13,13,230,7,7,13,13,102
1200 DATA 12,12,10,10,70,16,16,15,15,231,9,9,12,12
1210 DATA 103,16,16,9,9,71,18,18,13,13,232,9,9,13,13
1220 DATA 104,16,16,10,10,72,18,18,15,15
```

Commodore 64/Cornucopia

```
10 PRINT CHR$(147);
19 REM --SET SCREEN BORDER AND BACKGROUND TO BLACK--
20 POKE 53280,0
30 POKE 53281,0
39 REM --MAIN DRAWING LOOP--
40 FOR X=1 TO 13
50 READ CH,KO,F,T
60 FOR RO=F TO T
70 READ A,B
80 FOR CO=A TO B
89 REM --POKE SCREEN WITH CHARACTER--
90 POKE 1024+CO+40*RO,CH
99 REM --POKE COLOR MEMORY WITH COLOR--
100 POKE 55296+CO+40*RO,KO
110 NEXT CO,RO,X
120 GOTO 120
1000 DATA 86,9,1,23,3,3,3,4,3,5,3,6,3,7,3,9,4
1010 DATA 27,4,28,4,29,5,30,5,31,6,32,7,32,7
1020 DATA 32,8,32,9,13,10,14,11,14,13,15,14
1030 DATA 16,16,17,18,28,26,27,81,4,7,17,19
1040 DATA 23,18,22,17,22,16,21,16,21,15,19,15,18,14
1050 DATA 14,14,14,14,15,15,15,81,13,15,24,24,24,23
```

```
1060 DATA 23,22,22,21,21,20,21,18,22,18,23,19,26,20
1070 DATA 25,23,26,81,4,15,22,29,31,27,33,28,34,29
1080 DATA 33,29,32,28,33,27,31,30,32
1090 DATA 160,7,9,12,23,24,22,25,22,23,24
1100 DATA 160,5,12,17,20,22,19,23,19,23,19,23,20
1110 DATA 22,21,21,102,14,8,10,26,27,25,28,26,27
1120 DATA 160,8,11,15,26,27,25,28,24,29,24,29,25,28
1130 DATA 160,2,16,21,24,26,23,27,22,28,22,28,23,27
1140 DATA 24,26,87,6,10,14,28,29,28,30,29,31,30,31
1150 DATA 30,31,88,6,16,19,18,19,17,20,17,20,18,19
1160 DATA 42,2,13,20,16,17,15,18,15,18,16,17
1170 DATA 16,16,15,16,16,17,17
1180 DATA 90,10,7,8,24,24,23,25
```

IBM PC w/Color Graphics Adapter & IBM PCjr/Cornucopia

```
9 REM --SET SCREEN WIDTH AND ENABLE COLOR BURST--
10 WIDTH 40
20 SCREEN 0,1
29 REM --CLEAR SCREEN AND SET TO BLACK--
30 KEY OFF
40 COLOR 0,0
50 CLS
60 LOCATE ,,0
70 FOR X=1 TO 13
79 REM --MAIN DRAWING LOOP--
80 READ CH,KO,F,T
90 COLOR KO
100 FOR RO=F TO T
110 READ A,B
120 FOR CO=A TO B
130 LOCATE RO,CO
140 PRINT CHR$(CH);
150 NEXT CO,RO,X
160 GOTO 160
1000 DATA 88,6,1,23,3,3,3,4,3,5,3,6,3,7,3,9,4
1010 DATA 27,4,28,4,29,5,30,5,31,6,32,7,32,7
1020 DATA 32,8,32,9,13,10,14,11,14,13,15,14,16
1030 DATA 16,17,18,28,26,27,3,5,7,17,19,23,18
1040 DATA 22,17,22,16,21,16,21,15,19,15,18,14
1050 DATA 14,14,14,14,15,15,15,3,10,15,24,24
1060 DATA 24,23,23,22,22,21,21,20,21,18,22,18
1070 DATA 23,19,26,20,25,23,26,3,5,15,22,29,31
1080 DATA 27,33,28,34,29,33,29,32,28,33,27,31
1090 DATA 30,32,219,14,9,12,23,24,22,25,22,25
1100 DATA 23,24,219,2,12,17,20,22,19,23,19,23
1110 DATA 19,23,20,22,21,21,176,1,8,10,26,27
1120 DATA 25,28,26,27,219,12,11,15,26,27,25,28
1130 DATA 24,29,24,29,25,28,219,4,16,21,24,26
1140 DATA 23,27,22,28,22,28,23,27,24,26,79,1
1150 DATA 10,14,28,29,28,30,29,31,30,31,30,31
1160 DATA 5,1,16,19,18,19,17,20,17,20,18,19,42
1170 DATA 4,13,20,16,17,15,18,15,18,16,17,16
1180 DATA 16,15,16,16,17,17,4,12,7,8,24,24
1190 DATA 23,25
```

TI-99/4A/Cornucopia

```
9 REM --CLEAR SCREEN AND SET BACKGROUND COLOR--
10 CALL CLEAR
20 CALL SCREEN(2)
29 REM --DEFINE 14 SPECIAL CHARACTERS--
30 FOR X=1 TO 14
40 READ SH$,CH,SE,KF,KB
50 CALL CHAR(CH,SH$)
60 CALL COLOR(SE,KF,KB)
70 NEXT X
79 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
80 FOR X=1 TO 4
90 READ CH,F,T
100 FOR RO=F TO T
110 READ CO,EX
120 CALL HCHAR(RO,CO,CH,EX)
```

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AUTUMN PROGRAMS

```

130 NEXT RO
140 NEXT X
149 REM --DRAW DETAILED AND IRREGULAR PARTS--
150 FOR X=1 TO 36
160 READ CH,RO,CO
170 CALL HCHAR(RO,CO,CH)
180 NEXT X
190 GOTO 190
1000 DATA A801942194015422,96,9,6,1
1010 DATA 003C7E7E7E7E3C00,104,10,4,1
1020 DATA 003C7E7E7E7E3C00,112,11,14,1
1030 DATA C5E77D3C3C7DE7C5,120,12,12,1
1040 DATA 030F1F3F7F7FFFFF,128,13,11,1
1050 DATA C0F0F8FCFEFEFFFF,136,14,11,1
1060 DATA FFFF7F7F3F1F0F03,144,15,11,1
1070 DATA FFFF7F7F3F1F0F03,152,16,11,1
1080 DATA FFFFFFFFFFFFFFFF,95,8,11,1
1090 DATA 030F1F3F7F7FFFFF,39,1,7,1
1100 DATA C0F0F8FCFEFEFFFF,47,2,7,1
1110 DATA FFFF7F7F3F1F0F03,55,3,7,1
1120 DATA FFFF7F7F3F1F0F03,63,4,7,1
1130 DATA FFFFFFFFFFFFFFFF,64,5,7,1
2000 DATA 120,2,22,3,1,3,2,3,3,3,4,3,5,3,8,4,20
2010 DATA 4,21,4,22,5,22,5,23,6,23,7,22,7,22,8
2020 DATA 21,9,20,10,14,11,3,13,2,14,1,15,7
2030 DATA 104,9,24,15,4,14,3,13,5,13,3,13,3
2040 DATA 13,4,13,4,13,5,13,2,14,2,14,1,15,1
2050 DATA 15,5,17,3,18,3,20,2,96,10,23,17,2,18
2060 DATA 2,18,1,18,2,17,5,17,4,18,9,17,9
2070 DATA 16,10,15,9,16,9,20,6,22,4,24,2,112,9
2080 DATA 23,19,5,19,6,20,6,19,8,20,8,22,6,26
2090 DATA 2,27,1,26,2,25,4,23,6,24,4,26,2
2100 DATA 26,3,27,3,39,10,20,64,10,21,47
2110 DATA 10,22,64,11,20,64,11,21,64,11,22
2120 DATA 55,12,20,64,12,21,63,12,22,39,18,17
2130 DATA 64,18,18,47,18,19,64,19,17,64,19,18
2140 DATA 64,19,19,55,20,17,64,20,18,63,20,19
2150 DATA 128,12,16,136,12,17,144,13,16,152,13,17,128
2160 DATA 16,15,136,16,16,144,17,15,152,17,16,128,15
2170 DATA 21,95,15,22,95,15,23,95,15,24,136,15,25,144
2180 DATA 16,21,95,16,22,95,16,23,95,16,24,152,16,25

```

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

```

9 REM --DS CONTAINS PICTURE DATA--
10 LET DS="136,1,19,2,2,2,3,2,4,2,5,3,6,3,8,3,10,4,22,
4,23,4,24,5,25,5,25,6,25,7,25,8,25,9,25,10,15,12,16,14,
18,52,9,21,17,22,16,23,15,24,15,24,15,24,15,24,
16,24,16,25,17,26,19,27,20,23,22,24,23,11,19,19,21,20,
21,20,21,19,21,17,22,18,18,18,23,19,23,20,21,6,9,11,18,
21,18,21,20,20,128,11,18,17,18,16,19,16,19,17,18,20,2
1,19,22,19,22,20,21,"
19 REM --SET DATA POINTERS FOR SIMULATED 'READ'--
20 LET P1=4
30 LET P2=1
38 REM --MAIN DRAWING LOOP--
39 REM --EACH 'GOSUB 1000' RETURNS ONE NUMBER--
40 FOR X=1 TO 5
50 GOSUB 1000
60 LET CH=D
70 GOSUB 1000
80 LET F=D
90 GOSUB 1000
100 LET T=D
110 FOR R=F TO T
120 GOSUB 1000
130 LET A=D
140 GOSUB 1000
150 LET B=D
160 FOR C=A TO B
170 PRINT AT R,C;CHR$(CH);
180 NEXT C
190 NEXT R
200 NEXT X

```

```

210 GOTO 210
999 REM --SIMULATED READ/DATA SUBROUTINE--
1000 IF DS(P1)="," THEN GOTO 1030
1010 LET P1=P1+1
1020 GOTO 1000
1030 LET D=VAL DS(P2 TO P1-1)
1040 LET P2=P1+1
1050 LET P1=P2+1
1060 RETURN

```

TRS-80 Color Computer/Cornucopia

```

9 REM --CLEAR SCREEN AND SET TO BLACK--
10 CLS(0)
19 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
20 FOR X=1 TO 7
30 READ KO,F,T
40 FOR RO=F TO T
50 READ A,B
60 FOR CO=A TO B
70 PRINT@CO+32*RO,CHR$(KO);
80 NEXT CO,RO,X
89 REM --DRAW DETAILED AND IRREGULAR PARTS--
90 FOR X=1 TO 5
100 READ KO,CO,RO
110 PRINT@CO+32*RO,CHR$(KO);
120 NEXT X
130 GOTO 130
1000 DATA 159,0,14,0,0,0,2,0,4,1,6,1,8
1010 DATA 2,10,2,23,3,25,3,26,4,27,5,27
1020 DATA 6,27,8,27,10,14,12,17
1030 DATA 233,7,15,16,19,15,20,13,16
1040 DATA 13,17,13,19,14,21,15,21,18,22,19,20
1050 DATA 217,7,14,20,23,21,25,21,26
1060 DATA 20,26,20,26,24,26,22,27,23,25
1070 DATA 255,8,10,18,19,17,20,18,19
1080 DATA 223,11,13,16,17,15,18,16,17
1090 DATA 159,10,12,22,23,21,24,22,23
1100 DATA 191,12,14,20,21,19,22,20,21
1110 DATA 225,17,15,225,22,15
1120 DATA 209,26,15,210,28,14
1130 DATA 210,29,15

```

TRS-80 Model III/Cornucopia

```

9 REM --CLEAR SCREEN--
10 CLS
19 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
20 FOR X=1 TO 6
30 READ CH,F,T
40 FOR RO=F TO T
50 READ A,B
60 FOR CO=A TO B
70 POKE 15360+CO+64*RO,CH
80 NEXT CO,RO,X
89 REM --DRAW DETAILED AND IRREGULAR PARTS--
90 FOR X=1 TO 28
100 READ CH,CO,RO
110 POKE 15360+CO+64*RO,CH
120 NEXT X
130 GOTO 130
1000 DATA 191,0,13,7,7,7,8,7,10,8,13,8,16,9,20,10,25
1010 DATA 11,45,12,48,13,49,15,49,17,49,20,26,25,31
1020 DATA 239,8,15,28,32,25,28,25,28,25,29,28,34,32
1030 DATA 34,30,34,33,36,42,8,15,33,39,36,38,36,39
1040 DATA 35,36,35,35,35,38,36,41,41,43,64,8,14,40
1050 DATA 45,39,48,40,48,43,48,43,49,39,50,44,47,191
1060 DATA 9,9,41,42,191,11,12,39,40,39,40,184,29,9
1070 DATA 180,35,9,175,29,10,159,35,10,130,30,11,129
1080 DATA 34,11,139,31,11,135,33,11,184,37,11,180,42
1090 DATA 11,139,37,12,135,42,12,190,38,11,189,41,11
1100 DATA 175,38,12,159,41,12,160,40,8,144,43,8,139

```

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AUTUMN PROGRAMS

```
1110 DATA 40,9,135,43,9,188,41,8,188,42,8,191,46,11
1120 DATA 191,46,12,184,45,11,180,47,11,139,45,12
1130 DATA 135,47,12
```

VIC-20/Cornucopia

```
9 REM --RESERVE SPACE IN HIGH MEMORY--
10 POKE 52,24
20 POKE 56,24
30 CLR
39 REM --RESET CHARACTER SET POINTER--
40 POKE 36869,254
50 PRINT CHR$(147);
59 REM --SET SCREEN COLOR TO BLACK--
60 POKE 36879,8
69 REM --REDEFINE SPACE CHARACTER--
70 FOR X=6400 TO 6407
80 POKE X,0
90 NEXT X
99 REM --REDEFINE CHARACTERS @ THROUGH E--
100 FOR X=6144 TO 6191
110 READ SH
120 POKE X,SH
130 NEXT X
139 REM --MAIN DRAWING LOOP--
140 FOR X=1 TO 22
150 READ CH,KO,F,T
160 FOR RO=F TO T
170 READ A,B
180 FOR CO=A TO B
190 POKE 7680+CO+22*RO,CH
200 POKE 38400+CO+22*RO,KO
210 NEXT CO,RO,X
220 GOTO 220
1000 DATA 168,1,148,33,148,1,84,34
1010 DATA 3,15,31,63,127,127,255,255
1020 DATA 192,240,248,252,254,254,255,255
1030 DATA 255,255,127,127,63,31,15,3
1040 DATA 255,255,254,254,252,248,240,192
1050 DATA 197,231,125,60,60,125,231,197
2000 DATA 5,7,0,21,0,0,0,1,0,2,0,2,0,3
2010 DATA 1,4,1,5,1,7,1,10,2,14,2,15
2020 DATA 2,16,3,17,3,18,4,18,5,18
2030 DATA 5,18,6,18,7,18,8,8,9,9,10,11
2040 DATA 81,5,10,22,11,13,10,14,9,12
2050 DATA 8,12,8,9,8,9,8,10,8,9,8,9
2060 DATA 9,10,10,11,12,13,13,14
2070 DATA 81,6,10,22,14,14,15,15,15,16
2080 DATA 15,17,15,17,16,17,17,17,17,17
2090 DATA 14,17,16,18,16,19,17,18,18,19
2100 DATA 81,2,14,22,13,14,13,15,12,13
2110 DATA 13,13,13,13,14,15,15,15,15,16,15,15
2120 DATA 1,5,16,16,14,14,2,5,16,16,15,15
2130 DATA 3,5,17,17,14,14,4,5,17,17,15,15
2140 DATA 6,6,16,17,16,16,16,16
2150 DATA 1,7,12,12,13,13,2,7,12,12,14,14
2160 DATA 3,7,13,13,13,13,4,7,13,13,14,14
2170 DATA 1,2,14,14,10,10,2,2,14,14,11,11
2180 DATA 3,2,15,15,10,10,4,2,15,15,11,11
2190 DATA 1,4,17,17,10,10,2,4,17,17,11,11
2200 DATA 3,4,18,18,10,10,4,4,18,18,11,11
2210 DATA 0,3,13,21,11,11,12,12,12,12,11,11
2220 DATA 12,12,12,12,11,13,12,14,14,14
```

PROGRAMMING P.S.

Corrections to previous months' programs—and enhancements suggested by our readers

Commodore 64/Proto and the Dormirians (April, pages 100-102)

Line 470 should read

```
470 MS="YOU'RE STUCK ON DORMIR UNTIL NEXT WEEK.":GOTO 500
```

TI-99/4A/Liberty Bell (July, page 58)

Gail Rich of Indianapolis, Indiana, and her 4-year-old son discovered a way to improve the sound of our *Liberty Bell* program. A richer, more bell-like tone can be achieved by adding lines 281-284 as shown:

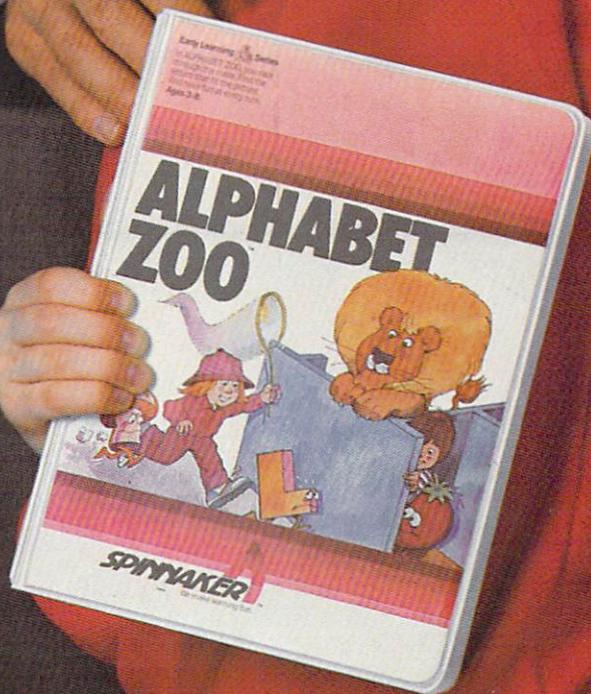
```
281 FOR V=0 TO 28 STEP 4
282 CALL SOUND(-100,340,V)
283 NEXT V
284 CALL SOUND(-100,340,28)
```

TIPS TO THE TYPIST

1. When you type program lines into your computer, be sure to copy them *exactly* as written. Numbers, punctuation marks, and spaces are very important!
 2. Remember to press RETURN or ENTER *after* every completed program line.
 3. Run the program when you finish typing it in by typing RUN and pressing the RETURN or ENTER key. If the computer gives you an error message, don't panic. Mistakes can be fixed. List the program by typing the word LIST and
- pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.
4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.
 5. When all else fails . . . turn off the computer and relax.

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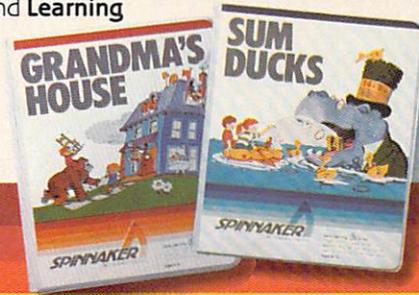
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THE CASE OF THE MISSING LAPIS LAZULI

Can You Solve The Mystery?

PUZZLE BY PETER FAVARO

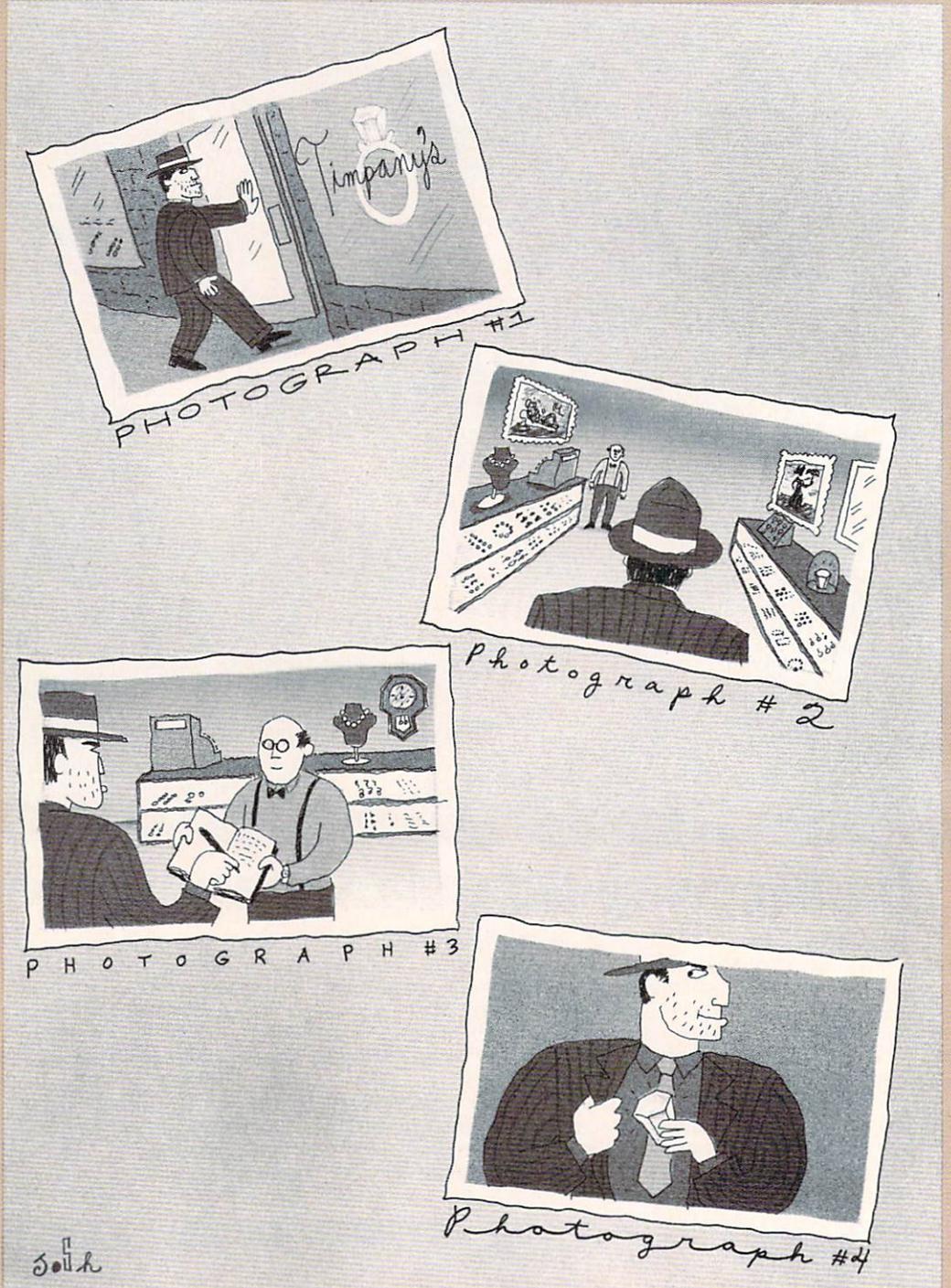
PROGRAM BY STEVEN C.M. CHEN

Savoring her latest victory, Lynette Leighton leaned back in her chair long enough for a fresh wisp of perfume to sweeten the air in her musty office. As the saying goes, Lynette had legs that went from here to there and back again. Her large black eyes sparkled as bright as the stolen stones she was hired to recover.

There was a quick knock on the glass door that read "Lynette Leighton, Private Eye—Specializing In Rare Gem Thefts." Lynette's protege, James, walked into the office with his usual aplomb, spilling the contents of his coffee cup all over his shoes. Half out of breath, James said with some urgency that Lynette was being called out of town on another case by a wealthy diamond merchant in Geneva, Switzerland. Lynette nodded toward the folder of photographs on her desk, and asked James if he could manage to close up the Larson case.

"No problem," said James as he deftly caught his cuff link in the drawer of Lynette's desk, cleanly removing his shirt sleeve from his arm and emptying the contents of her desk onto the floor in one swift move.

The Larson case had gone off as smooth as silk. Frank ("Fingers") Larson, alias Louis ("Lefty") Bourgenion, was a high-class jewel thief who had always eluded Lynette. That morn-



ing, shortly after 9 a.m., Lynette had dressed as a wealthy, camera-laden tourist and trailed Fingers. This time she had him nailed, with two crisp shots of Fingers entering

Timpany's jewelry store, one of him signing the guest book with an assumed name, and another of him slipping the flawless 29-carat lapis lazuli into his jacket.

LATER THAT DAY ...

When James arrived at the police station with the evidence, Fingers snickered and said, "I got an alibi. See what da clock sez in dese photos? I wuz on a

PETER FAVARO, PH.D., is a contributing editor to FAMILY COMPUTING. His inspiration for this puzzle came from the dinner table stories told by his father, a retired New York City detective. STEVEN C.M. CHEN is a contributing technical editor to FAMILY COMPUTING.



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plane goin' to visit my poor sick auntie in Florida and I got da ticket to prove it."

Sure enough, Fingers' story checked out. There was no way he could have been in two places at once. Fingers offered: "Maybe dere's two people in dis world as handsome as me, heh, heh."

The authorities had no choice but to release Fingers in 24 hours, since they hadn't actually caught him with the lapis lazuli in hand. James could hardly fathom the notion that Lynette might have slipped up. He was so stymied he drove directly into an open manhole on his way back from the police station.

Back in the office, James tried reaching Lynette in Geneva—to no avail. By the time she returned the next day, Fingers would be released. This was one case James would have to solve

by himself. His only hope was to reexamine the photographs for some clue that would place Fingers at the scene of the crime at the correct time.

HOW TO PLAY

Set your computer to all uppercase letters before running the program. Use your computer as a magnifying glass. First select photograph 1, 2, 3, or 4, and then type in the name of the object you would like to examine more closely.

To examine another object in a photograph, type "E." To select a new photograph, type "S." The computer will supply you with only one piece of evidence that is crucial to solving the mystery.

When you are ready to guess, type "G." If you guess incorrectly, type "H" for help. The solution will appear next month.

Base Version (TRS-80 Color Computer)/The Missing Lapis Lazuli

```
10 CLEAR 900: DIM ES(11): WL=32: WX=6: TRU=-1: TL=0: CLS
20 FOR I=1 TO 11: D$="": READ A: FOR J=1 TO A: READ TS
30 C=ASC(LEFT$(TS,1))-64: FOR Z=2 TO LEN(TS)
40 N=ASC(MID$(TS,Z,1))-C: IF N+C<65 THEN 60
50 Y=N+TRU*26*(N<65): GOTO 70
60 Y=N+TRU*33*(N<32)
70 D$=D$+CHR$(Y): NEXT Z: D$=D$+" ": NEXT J
80 ES(I)=LEFT$(D$,LEN(D$)-1): NEXT I
90 CLS: RS="CHOOSE THE PICTURE YOU WOULD"
100 RS=RS+" LIKE TO EXAMINE (1, 2, 3, OR 4). "
110 GOSUB 1000: PRINT: PRINT "NUMBER? ";
120 PS=INKEY$: IF PS<"1" OR PS>"4" THEN 120
130 CLS: NS="PICTURE #": PS: GOSUB 2000: PRINT: PRINT
140 RS="WHAT OBJECT WOULD YOU LIKE TO EXAMINE?"
150 GOSUB 1000: PRINT: INPUT "THE"; SS: IF SS="" THEN 130
160 CLS: IF PS<>CHR$(51) THEN 190
170 IF SS<>ES(5) AND SS<>ES(6) AND SS<>ES(7) THEN 190
180 RS="THE "+SS+" SAYS "+ES(8): GOTO 210
190 I=RND(4)
200 RS=ES(I)+" THE "+SS+"! YOU'D BETTER LOOK ELSEWHERE "
210 GOSUB 1000: GOSUB 3000: RS="PRESS <E> TO EXAMINE"
220 RS=RS+" THIS PHOTO AGAIN; <S> TO SELECT A NEW"
230 RS=RS+" PHOTO; OR <G> TO GUESS.": GOSUB 1000
240 KS=INKEY$: IF KS="S" THEN 90
250 IF KS="E" THEN 130
260 IF KS">"G" THEN 240
270 CLS: RS="WHAT IMPORTANT OBJECT DID JAMES FAIL"
280 RS=RS+" TO TAKE INTO CONSIDERATION?": GOSUB 1000
290 PRINT: INPUT "THE"; TS: IF TS="" THEN 270
300 CLS: IF TS=ES(9) THEN RS=ES(10): GOSUB 1000: END
310 NS="WRONG!": GOSUB 2000: GOSUB 3000
320 RS="PRESS <S> TO SELECT A PHOTO OR"
330 RS=RS+" <H> FOR HELP.": GOSUB 1000
340 KS=INKEY$: IF KS="S" THEN 90
350 IF KS">"H" THEN 340
360 CLS: RS=ES(11): GOSUB 1000: GOSUB 3000
```

```
370 RS="PRESS ANY KEY TO CONTINUE.": GOSUB 1000
380 KS=INKEY$: IF KS="" THEN 380 ELSE 90
1000 IF LEN(RS)<=WL THEN NS=RS: GOSUB 2000: RETURN
1010 J=WL+1: K=1: FOR I=WL+1 TO 2 STEP -1
1020 IF MID$(RS,I,1)=" " THEN K=0: J=I: I=I-1
1030 NEXT I: NS=LEFT$(RS,J-1): GOSUB 2000
1040 RS=RIGHT$(RS,LEN(RS)-J+K): GOTO 1000
2000 IF LEN(NS)=WL THEN PRINT NS: RETURN
2010 PRINT TAB((WL-LEN(NS))/2+TL); NS: RETURN
3000 FOR I=1 TO WX: PRINT: NEXT I: RETURN
4000 DATA 3, THINBCHA, BURGEKCN, TUVION, 4, CWKHUH*V
4010 DATA MABGUVAT, SYBLAR, GHIVBA, 5, MLBH4ER, KHLDEYR
4020 DATA NMCIF, NHWAS, KHTES, 5, PIXUHBSA, FNURSKY
4030 DATA MJBHYQA4G, SUX, CHADPLQLQJ, 1, MPYBPX, 1, DAEXGL
4040 DATA 1, BYTKUVYCVJE, 1, C5=7<1, 1, MZVEEBE, 15
4050 DATA DGSVVIGX, AQIPUP, J=, LIME, GAHRLU, IRW, SMAX
4060 DATA DGMVVS2, FZNK, SATGWL, MBA, KESP, TWFIWE, HIZM
4070 DATA CUHYHUVHG1, 4, MERSYRPG, LAZ, TNBY, IBLNWN7
```

Atari/The Missing Lapis Lazuli

```
10 DIM DS(11), ES(245), TS(11), NS(150), PE(12), CLS(1), RS(150), SS(100): CLS=CHR$(125): POKE 82,0: OPEN #1,4,0,"K:"
20 PRINT CLS; : FOR I=1 TO 11: NS="" : READ A: FOR J=1 TO A: READ D$
30 C=ASC(D$)-64: FOR Z=2 TO LEN(D$)
40 N=ASC(D$(Z))-C: IF N+C<65 THEN 60
50 Y=N+26*(N<65): GOTO 70
60 Y=N+33*(N<32)
70 NS(LEN(NS)+1)=CHR$(Y): NEXT Z: NS(LEN(NS)+1)=" ": NEXT J: T=LEN(ES)+1: PE(I)=T
80 ES(T)=NS(1,LEN(NS)-1): NEXT I: PE(12)=LEN(ES)+1
90 PRINT CLS; : RS="CHOOSE THE PICTURE YOU WOULD LIKE TO EXAMINE (1, 2, 3, OR 4). "
100 GOSUB 1000: PRINT: PRINT "NUMBER? ";
110 GET #1, P: P=P-48: IF P<1 OR P>4 THEN 110
120 PRINT CLS; : NS="PICTURE #": NS(10)=STR$(P): GOSUB 2000: PRINT: PRINT
130 RS="WHAT OBJECT WOULD YOU LIKE TO EXAMINE?"
140 GOSUB 1000: PRINT: PRINT "THE"; : INPUT SS: IF SS="" THEN 120
150 PRINT CLS; : IF P<>3 THEN 190
160 IF SS<>ES(PE(5),PE(6)-1) AND SS<>ES(PE(6),PE(7)-1) AND SS<>ES(PE(7),PE(8)-1) THEN 190
170 RS="THE ": RS(5)=SS: RS(LEN(RS)+1)=" SAYS "
180 RS(LEN(RS)+1)=ES(PE(8),PE(9)-1): GOTO 210
190 I=INT(RND(0)*4)+1
200 RS=ES(PE(I),PE(I+1)-1): RS(LEN(RS)+1)=" THE ": RS(LEN(RS)+1)=SS: RS(LEN(RS)+1)="! YOU'D BETTER LOOK ELSEWHERE. "
210 GOSUB 1000: GOSUB 3000: RS="PRESS <E> TO EXAMINE THIS PHOTO AGAIN; <S> TO SELECT A NEW PHOTO"
220 RS(LEN(RS)+1)=""; OR <G> TO GUESS.": GOSUB 1000
230 GET #1, K: IF K=83 THEN 90
240 IF K=69 THEN 120
250 IF K<>71 THEN 230
260 PRINT CLS; : RS="WHAT IMPORTANT OBJECT DID JAMES FAIL TO TAKE INTO CONSIDERATION?": GOSUB 1000
270 PRINT: PRINT "THE"; : INPUT TS: IF TS="" THEN 260
280 PRINT CLS; : IF TS=ES(PE(9),PE(10)-1) THEN RS=ES(PE(10),PE(11)-1): GOSUB 1000: END
290 NS="WRONG!": GOSUB 2000: GOSUB 3000
300 RS="PRESS <S> TO SELECT A PHOTO OR <H> FOR HELP.": GOSUB 1000
310 GET #1, K: IF K=83 THEN 90
320 IF K<>72 THEN 310
330 PRINT CLS; : RS=ES(PE(11),PE(12)-1): GOSUB 1000: GOSUB 3000
340 NS="PRESS ANY KEY TO CONTINUE.": GOSUB 2000
350 GET #1, K: ON K=155 GOTO 350: GOTO 90
1000 IF LEN(RS)<=40 THEN NS=RS: GOSUB 2000: RETURN
1010 J=41: K=1: FOR I=41 TO 2 STEP -1
1020 IF RS(I,I)=" " THEN K=0: J=I: I=I-
```

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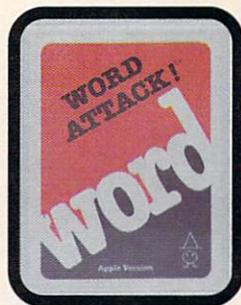


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PUZZLE

```

1030 NEXT I:R$=R$(J-1):GOSUB 2000
1040 R$=R$(J-K+1,LEN(R$)):GOTO 1000
2000 IF LEN(NS)=40 THEN PRINT NS$:RETURN
2010 POKE 85,INT((40-LEN(NS))/2):PRINT NS$:RETURN
3000 FOR I=1 TO 10:PRINT :NEXT I:RETURN
4000 DATA 3,THINBCHA,BURGEKCN,TUVION,4,CWKHUH*V
4010 DATA MABGUVAT,SYBLAR,GHIVBA,5,MLBH4ER,KHLDETYR
4020 DATA NMCIF,NHWAS,KHTES,5,PIXUHBSA,FNURSKY
4030 DATA MJBHYQA4G,SUX,CHADPLQLQJ,1,MPYBPX,1,DAEXGL
4040 DATA 1,BYTKUVYCVJEJ,1,C5=7<1,1,MZVEEBE,15
4050 DATA DGSVVIGX%,AQIPUP,J=LIME,GAHRLU,IRW,SMAX
4060 DATA DQMVVSV2,FZNK,SATGWL,MBA,KESP,TWFIWE,HIZM
4070 DATA CUHYHUVHG1,4,MERSYRPG,LAZ, TNBY,IBLNWN7

```

TI-99/4A/The Missing Lapis Lazuli

```

10 RANDOMIZE
20 DIM E$(11)
30 CALL CLEAR
40 FOR I=1 TO 11
50 D$=""
60 READ A
70 FOR J=1 TO A
80 READ T$
90 C=ASC(SEG$(T$,1,1))-64
100 FOR Z=2 TO LEN(T$)
110 N=ASC(SEG$(T$,Z,1))-C
120 IF N+C<65 THEN 150
130 Y=N-26*(N<65)
140 GOTO 160
150 Y=N-33*(N<32)
160 D$=D$&CHR$(Y)
170 NEXT Z
180 D$=D$&" "
190 NEXT J
200 E$(I)=SEG$(D$,1,LEN(D$)-1)
210 NEXT I
220 R$="CHOOSE THE PICTURE YOU WOULD LIKE TO EXAMINE (
1, 2, 3, OR 4). "
230 GOSUB 1000
240 PRINT "NUMBER? ";
250 CALL KEY(3,P,S)
260 IF (P<49)+(P>52) THEN 250
270 R$="PICTURE #"&CHR$(P)
280 GOSUB 1000
290 PRINT : "WHAT OBJECT WOULD YOU LIKE"
300 PRINT TAB(8); "TO EXAMINE?"
310 PRINT
320 INPUT "THE ":S$
330 IF S$="" THEN 270
340 IF P<>51 THEN 380
350 IF (S$<>E$(5))*(S$<>E$(6))*(S$<>E$(7)) THEN 380
360 R$="THE "&S$&" SAYS "&E$(8)
370 GOTO 390
380 R$=E$(INT(RND*4)+1)&" THE "&S$&"! YOU'D BETTER LOO
K ELSEWHERE."
390 GOSUB 1000
400 GOSUB 3000
410 PRINT "PRESS <E> TO EXAMINE THIS": "PHOTO AGAIN; <S
> TO SELECT A": " NEW PHOTO; OR <G> TO GUESS."
420 CALL KEY(3,K,S)
430 IF K=83 THEN 220
440 IF K=69 THEN 270
450 IF K<>71 THEN 420
460 R$="WHAT IMPORTANT OBJECT DID JAMES FAIL TO TAKE I
NTO CONSIDERATION?"
470 GOSUB 1000
480 INPUT "THE ":T$
490 IF T$="" THEN 460
500 IF T$<>E$(9) THEN 540
510 R$=E$(10)
520 GOSUB 1000
530 END

```

```

540 R$="WRONG!"
550 GOSUB 1000
560 GOSUB 3000
570 PRINT "PRESS <S> TO SELECT A PHOTO OR <H> FOR HELP
"
580 CALL KEY(3,K,S)
590 IF K=83 THEN 220
600 IF K<>72 THEN 580
610 R$=E$(11)
620 GOSUB 1000
630 GOSUB 3000
640 PRINT "PRESS ANY KEY TO CONTINUE."
650 CALL KEY(3,K,S)
660 IF S=0 THEN 650 ELSE 220
1000 CALL CLEAR
1010 IF LEN(R$)>28 THEN 1060
1020 N$=R$
1030 GOSUB 2000
1040 PRINT
1050 RETURN
1060 J=29
1070 K=1
1080 FOR I=29 TO 2 STEP -1
1090 IF SEG$(R$,I,1)<>" " THEN 1130
1100 K=0
1110 J=I
1120 I=1
1130 NEXT I
1140 N$=SEG$(R$,1,J-1)
1150 GOSUB 2000
1160 R$=SEG$(R$,J-K+1,LEN(R$)-J+K)
1170 GOTO 1010
2000 PRINT TAB((28-LEN(NS))/2);NS;
2010 IF LEN(NS)=28 THEN 2030
2020 PRINT
2030 RETURN
3000 FOR I=1 TO 7
3010 PRINT
3020 NEXT I
3030 RETURN
4000 DATA 3,THINBCHA,BURGEKCN,TUVION,4,CWKHUH*V
4010 DATA MABGUVAT,SYBLAR,GHIVBA,5,MLBH4ER,KHLDETYR
4020 DATA NMCIF,NHWAS,KHTES,5,PIXUHBSA,FNURSKY
4030 DATA MJBHYQA4G,SUX,CHADPLQLQJ,1,MPYBPX,1,DAEXGL
4040 DATA 1,BYTKUVYCVJEJ,1,C5=7<1,1,MZVEEBE,15
4050 DATA DGSVVIGX%,AQIPUP,J=LIME,GAHRLU,IRW,SMAX
4060 DATA DQMVVSV2,FZNK,SATGWL,MBA,KESP,TWFIWE,HIZM
4070 DATA CUHYHUVHG1,4,MERSYRPG,LAZ, TNBY,IBLNWN7

```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM & Apple/The Missing Lapis Lazuli

Use the base version, with the following alterations:
Change CLS to HOME in lines 90, 130, 160, 270, 300, and 360.

Change lines 120, 150, 190, 240, 290, 340, and 380 to read as follows:

```

120 GET P$:IF P$<"1" OR P$>"4" THEN 120
150 GOSUB 1000:PRINT:INPUT "THE ";S$:IF S$="" THEN 130
190 I=RND(1)*4+1
240 GET K$:IF K$="S" THEN 90
290 PRINT:INPUT "THE ";T$:IF T$="" THEN 270
340 GET K$:IF K$="S" THEN 90
380 GET K$:GOTO 90

```

Finally, if you have an ADAM, change line 10 to read

```
10 DIM e$(11):wL=31:wx=9:tru=1:tl=1:HOME
```

If you have an Apple, change line 10 to read

```
10 DIM E$(11):wL=40:WX=10:TRU=1:TL=1:HOME
```

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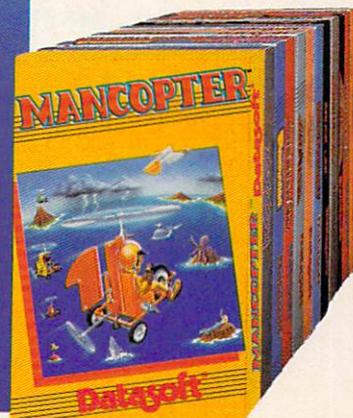
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Scott
Compton

Commodore 64 & VIC-20/The Missing Lapis Lazuli

Use the base version, with the following alterations: Change CLS to PRINT CHR\$(147); in lines 90, 130, 160, 270, 300, and 360. Change lines 120, 190, 240, 340, and 380 to read as follows:

```
120 GET P$:IF P$<"1" OR P$>"4" THEN 120
190 I=RND(0)*4+1
240 GET K$:IF K$="S" THEN 90
340 GET K$:IF K$="S" THEN 90
380 GET K$:ON -(K$="") GOTO 380:GOTO 90
```

Finally, if you have a Commodore 64, change line 10 to read

```
10 DIM E$(11):WL=40:WX=10:TRU=-1:TL=0:PRINT CHR$(147)
```

If you have a VIC-20, change line 10 to read

```
10 DIM E$(11):WL=22:WX=8:TRU=-1:TL=0:PRINT CHR$(147)
```

IBM PC/The Missing Lapis Lazuli

Use the base version, except change lines 10 and 190 to read as follows:

```
10 DIM E$(11):WL=80:WX=12:TRU=-1:TL=0:CLS:WIDTH WL:LOCATE ,,0:KEY OFF:RANDOMIZE
190 I=RND*4+1
```

IBM PCjr/The Missing Lapis Lazuli

Use the base version, except change lines 10 and 190 to read as follows:

```
10 DIM E$(11):WL=40:WX=10:TRU=-1:TL=0:CLS:WIDTH WL:LOCATE ,,0:KEY OFF:RANDOMIZE
190 I=RND*4+1
```

TRS-80 Model III/The Missing Lapis Lazuli

Use the base version, except change line 10 to read as follows:

```
10 CLEAR 900:DIM E$(11):WL=64:WX=9:TRU=-1:TL=0:CLS:RANDOM
```

TRS-80 Model 4/The Missing Lapis Lazuli

Use the base version, except change line 10 to read as follows:

```
10 DIM E$(11):WL=80:WX=12:TRU=-1:TL=0:PRINT CHR$(15):CLS:RANDOM
```

SOLUTION TO LAST MONTH'S PUZZLE

Muchincommon was moving three jugs along the points of a compass. On days two, three and four, jug "+" moved by one space, and jugs "." and "C" by two spaces. On day two, jug "+" moved west (from its original position on day one as shown in the illustration); jug ".", south; and jug "C", north. On day three, jug "+" moved east; jug ".", east; and jug "C", south. And on day four, jug "+" moved south; jug ".", north; and jug "C", west. Therefore, for each jug to have moved in all four directions, on day five, jug "+" should move one space north; jug ".", two spaces west; and jug "C" two spaces east, thus returning to their positions on day one.

GET YOUR CHRISTMAS CARD LIST OFF TO AN EARLY START With Our Apple Mailing List

**BY BRENT FRIEDMAN,
EDITED BY STEVEN C. M. CHEN**

It's almost time to start sending off your Christmas cards again. Chances are you'll spend hours searching for zip codes and addressing envelopes. But now you can cut your time in half (and get a jump on next year's list) with this *Mailing List* program.

Mailing List lets you create, modify, search, store, retrieve, and print mailing lists of up to 100 names and addresses each. Since the program is long, you might want to type it in over several sittings. SAVE the program to disk at the end of each session. Before you actually start using *Mailing List*, test each feature carefully with dummy information to catch any typing errors you may have made. This can save hours of frustration later.

When you first RUN *Mailing List*, you'll see a main menu with a list of eight options. Select option 1) BEGIN A NEW LIST, by pressing "1". This option clears memory of old information, so use it only when you want to start a new mailing list. After you select this or most other options, you will be asked whether you want to proceed (that's in case you accidentally pressed the wrong key). Press the "Y" key (for Yes). Pressing the "N" key (for No) will return you directly to the main menu.

BRENT FRIEDMAN is a 17-year-old premed student at the University of Kentucky.

You will now see RECORD 1 displayed on your screen. Each record contains five categories of information: NAME, STREET, CITY, STATE/ZIP, and REMARKS. You will also see a short menu of options at the bottom of the screen: <I> INPUT/EDIT RECORD, <E> EXIT TO MENU, BACK ONE RECORD, and <F> FORWARD ONE RECORD.

Since you're just beginning, RECORD 1 is empty. To store information in the record, press the "I" key for INPUT/EDIT RECORD. The program will prompt you to enter information for each category. Do not use commas when entering data—the computer will ignore anything you enter after a comma. You can use the REMARKS category to note birthdays, special occasions, etc. (REMARKS are for your own reference; they will not be printed on the mailing labels.)

If you don't want to enter information in a specific category, you don't have to. Simply press RETURN at the prompt. When you've finished entering a record, press any key and the program will redisplay the current record (with the information you just input). If you've made a mistake, press "I" and correct the information as requested. You can skip over any category by pressing RETURN at the prompt, and its contents will remain unchanged.

Now press the "." (peri-

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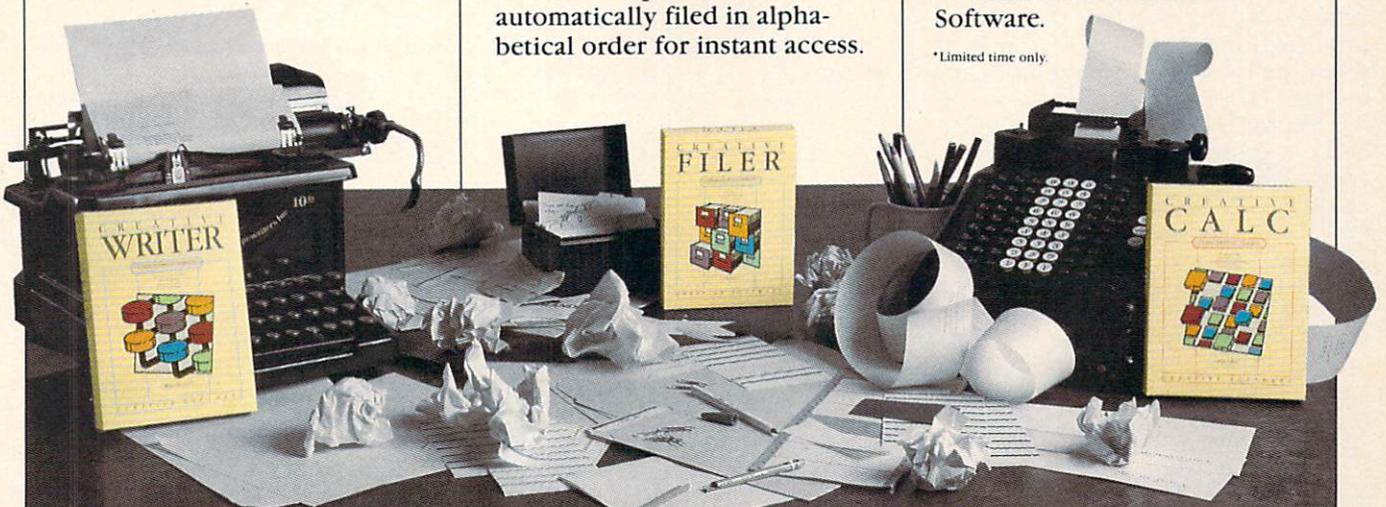
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C R E A T I V E S O F T W A R E

PHOTOGRAPH BY REBECCA ROE



Brent Friedman, the author of *Mailing List*.

od) key to move forward one record, and repeat the above procedure for entering information. "." (period) and "," (comma) let you move freely through the mailing list from one record to another. The screen window can display two records at once. The record displayed lower on the screen is the one you are in and where you can enter or change information.

Whenever you like, you can press "E" (EXIT TO MENU) to return to the main options menu. If you want to add more records to your list, you can return to the INPUT/EDIT screen by pressing option 2) ADD OR EDIT RECORDS, and you will be back at RECORD 1.

As an alternative to scrolling through your list with the "." and "," keys, you can use option 5) SEARCH FOR A RECORD. You will first be prompted to select the category of information you wish to scan (for example, the NAME field). Then you will be asked to input the information you wish to search for. The computer will recognize partial matches within a field, so you can find John Doe's name by searching for either "John" or "Doe." Be sure to input a word exactly as it is on the record, including uppercase and lowercase letters. The program will not recognize "John" as a match for "JOHN."

While the computer scans your list, the record

numbers will be displayed on the screen. When a match is found, the pertinent record will be displayed and the search will pause. Pressing the space bar will continue the search for further matches. Pressing ESC will take you back to the main menu without completing the search. Pressing RETURN will put you back in INPUT/EDIT mode, so you can edit the record you've found as previously described. When you have made your changes, the program will prompt for a keypress, and then continue to search for further matches.

To save a list, select option 3) SAVE THE LIST TO DISK from the main menu. Your disk directory will automatically be displayed. Enter an appropriate file name at the prompt, or exit the SAVE function by pressing RETURN. This program automatically saves files with the file name extender .LIST, so they will be easy to spot in your disk catalog.

To load a list you previously saved, select option 4) LOAD A LIST FROM DISK. Select the file you wish to load from the disk directory, and enter its entire name (including the extender .LIST) at the prompt. The list will load, and any information that was already in memory will be destroyed. (So if you've been working on one list and wish now to work on another, SAVE the list

you've just finished before loading the new one!)

Printing out mailing labels from your list is easy. Make sure your printer is plugged in, turned on and active, and that the labels are in place. Then select option 6) PRINT THE LIST from the main menu. You will be prompted to enter the first and last record numbers you wish to print. If you want to print labels for the entire list, enter "1" at the FROM RECORD prompt, and 100 (or the number of the last label in your list) at the TO RECORD prompt. (If you wish to print only one label, enter its record

number at both prompts.) Next, you will be asked to specify both the number of blank lines you want between labels and the position of the left print margin. This information will depend on the size of your labels, and you may have to experiment to find the correct settings.

When you're ready to print, press any key. You can stop the printing process at any time by pressing the ESC key.

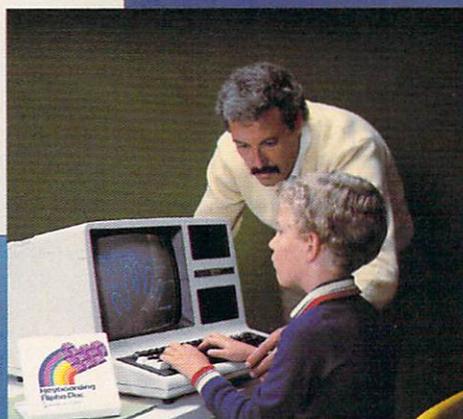
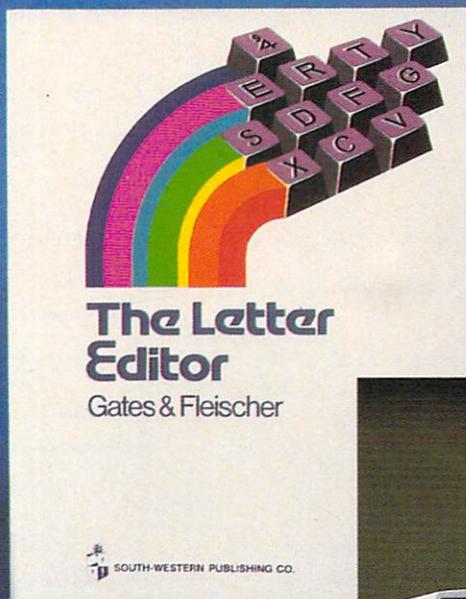
Option 7 on the main menu displays a disk directory. Option 8 terminates the *Mailing List* program and returns you to BASIC.

Apple/Mailing List

```

10 TEXT:HOME:ONERR GOTO 1000
20 DIM R$(100,4),MUS(8),FIS(4)
30 LS = " ":FOR I = 1 TO 38:LS = LS+"-":NEXT I
40 DS = CHR$(13)+CHR$(4):GS = CHR$(7):EX$ = "PRESS <RE
TURN> TO EXIT.":PS = " PLEASE PRESS ANY KEY TO CONTI
NUE."
50 FOR I = 1 TO 8:READ MUS(I):NEXT I
60 FOR I = 0 TO 4:READ TS:FIS(I) = TS+"":NEXT I
70 INVERSE:PRINT SPC(14);"MAILING LIST";SPC(14);
80 NORMAL:POKE 34,2
90 HOME:PRINT:FOR I = 1 TO 8
100 PRINT TAB(8);I;" " ;MUS(I):PRINT:NEXT I
110 PRINT TAB(8);"SELECTION --> ";
120 GET AS:IF AS < "1" OR AS > "8" THEN PRINT GS;:GOTO
120
130 SEL = VAL(AS):IF SEL = 7 THEN 160
140 HOME:PRINT "DO YOU WANT TO ";MUS(SEL);"? " ;:GET AS
150 IF AS <> "Y" AND AS <> CHR$(121) THEN 90
160 HOME:ON SEL GOTO 170,180,310,310,420,630,800,810
170 I = FRE(0):FOR I = 1 TO 100:FOR J = 0 TO 4:R$(I,J)
= "":NEXT J,I
180 X = 1
190 VTAB 21:PRINT TAB(10);"<I> INPUT/EDIT RECORD"
200 PRINT TAB(10);"<E> EXIT TO MENU"
210 PRINT TAB(10);"<,> BACK ONE RECORD"
220 PRINT TAB(10);"<. > FORWARD ONE RECORD";
230 POKE 35,20:VTAB 3:HTAB 1:PRINT LS
240 GOSUB 2000
250 GET AS:IF AS = "E" OR AS = CHR$(101) THEN POKE 35,
24:GOTO 90
260 IF AS = "I" OR AS = CHR$(105) THEN POKE 35,24:HOME
:GOSUB 3000:GOTO 190
270 IF AS = "," THEN X = X-1:GOTO 300
280 IF AS = "." THEN X = X+1:GOTO 300
290 PRINT GS;:GOTO 250
300 X = X-100*((X > 100)-(X < 1)):GOTO 240
310 I = FRE(0):GOSUB 5000:PRINT EX$:PRINT
320 INPUT "FILE NAME--> ";AS:IF AS = "" THEN 90
330 IF SEL = 4 THEN 380
340 IF LEN(AS) > 25 THEN PRINT GS;:GOTO 320
350 AS = AS+".LIST":PRINT:PRINT "SAVING ";AS;" ..."
360 PRINT DS;"OPEN ";AS:PRINT DS;"WRITE ";AS
370 FOR I = 1 TO 100:FOR J = 0 TO 4:PRINT R$(I,J):NEXT
J,I:GOTO 410
380 PRINT DS;"UNLOCK ";AS:PRINT "LOADING ";AS;" ..."
390 PRINT DS;"OPEN ";AS:PRINT DS;"READ ";AS
400 FOR I = 1 TO 100:FOR J = 0 TO 4:INPUT R$(I,J):NEXT
J,I
410 PRINT DS;"CLOSE ";AS:GOTO 90
420 FOR I = 1 TO 5:PRINT TAB(10);I;" " ;FIS(I-1)
430 NEXT I:PRINT:PRINT TAB(10);"SEARCH WHICH FIELD? ";
    
```

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READER-WRITTEN PROGRAM

```
440 GET AS:IF AS < "1" OR AS > "5" THEN PRINT GS;:GOTO 440
450 A = VAL(AS)-1:HOME:INPUT "SEARCH FOR ... ";SS
460 IF SS = "" THEN PRINT GS:GOTO 90
470 GOSUB 4000:POKE -16368,0:SL = LEN(SS):X = 0
480 FOR I = 1 TO 100:VTAB 3:PRINT:PRINT "SEARCHING REC
ORD ";I
490 FOR J = 1 TO LEN(R$(I,A))-SL+1
500 IF SS = MID$(R$(I,A),J,SL) THEN X = I
510 NEXT J:K = PEEK(-16384):IF K = 155 THEN I = 100:X
= 0
520 IF X < I THEN 600
530 POKE 35,24:HOME:PRINT "FOUND ";CHR$(34);SS;CHR$(34
);" IN RECORD ";I
540 PRINT:PRINT L$:GOSUB 2000
550 VTAB 22:PRINT "PRESS <SPACE BAR> TO CONTINUE, <RET
URN>"
560 PRINT TAB(4);"TO EDIT RECORD, OR <ESC> TO EXIT.";
570 GET K$:K = ASC (K$):IF K <> 13 AND K <> 27 AND K <
> 32 THEN 570
580 POKE 35,23:HOME:IF K = 13 THEN GOSUB 3000:GOSUB 40
00
590 IF K$ = CHR$(27) THEN I = 100
600 NEXT I:POKE 35,24:HOME:IF X <> 0 OR K = 155 THEN 9
0
610 PRINT:PRINT GS;TAB(16);"NO MATCH!"
620 PRINT:PRINT P$;:GET AS:GOTO 90
630 HOME:INPUT "PRINT FROM RECORD --> ";T$:R1 = VAL(T$
)
640 IF R1 < 1 OR R1 > 100 THEN PRINT GS:GOTO 630
650 INPUT "TO RECORD --> ";T$:R2 = VAL(T$)
660 IF R2 < R1 OR R2 > 100 THEN PRINT GS;:GOTO 650
670 INPUT "BLANK LINES BETWEEN LABELS --> ";T$
680 SP = VAL(T$):IF SP < 1 THEN PRINT GS;:GOTO 670
690 INPUT "LEFT MARGIN --> ";T$:LM = VAL(T$)
700 IF LM < 1 OR LM > 60 THEN PRINT GS;:GOTO 690
710 HOME:PRINT "PRESS ANY KEY WHEN PRINTER IS READY.";
:GET AS
720 HOME:PRINT "PRESS <ESC> KEY TO STOP PRINTING."
730 POKE -16368,0:PRINT D$;"PR#1":FOR I = R1 TO R2
740 IF PEEK(-16384) = 155 THEN I = R2:GOTO 780
750 PRINT TAB(LM);R$(I,D):PRINT TAB(LM);R$(I,1)
760 PRINT TAB(LM);R$(I,2);" ";R$(I,3)
770 FOR J = 1 TO SP:PRINT:NEXT J
780 NEXT I:PRINT D$;"PR#0":HOME
790 PRINT P$;:GET AS:GOTO 90
800 GOSUB 5000:PRINT P$;:GET AS:GOTO 90
810 TEXT:HOME:END
1000 PRINT:CODE = PEEK(222):IF CODE = 0 OR CODE > 14 T
HEN 1030
1010 PRINT GS;"SORRY! I CAN'T DO THAT! ERROR CODE ";CO
DE;". "
1020 PRINT:PRINT P$;:GET AS:GOTO 90
1030 IF CODE = 16 THEN PRINT "SYNTAX ERROR AT LINE ";P
EEK(218)+256*PEEK(219);".":END
1040 PRINT "I'M GETTING ERROR CODE ";CODE;". "
1050 PRINT "PLEASE CHECK YOUR MANUAL.":TEXT:END
2000 PRINT TAB(15);"RECORD ";:INVERSE:PRINT X:NORMAL
2010 PRINT:FOR J = 0 TO 4:PRINT FI$(J);R$(X,J):NEXT J
2020 PRINT L$:RETURN
3000 PRINT L$:GOSUB 2000
3010 PRINT TAB(3);"IF THERE'S NO CHANGE, PRESS <RETURN
>."
3020 PRINT:PRINT TAB(15);"RECORD ";X:PRINT L$
3030 FOR J = 0 TO 4:PRINT LEFT$(FI$(J),LEN(FI$(J))-2);
3040 INPUT "? ";T$:IF T$ <> "" THEN R$(X,J) = T$
3050 NEXT J:PRINT L$:PRINT:PRINT P$;:GET AS:HOME:RETUR
N
4000 VTAB 24:PRINT TAB(11);"PRESS <ESC> TO EXIT.";
4010 POKE 35,22:RETURN
5000 PRINT D$;"CATALOG":PRINT:RETURN
6000 DATA BEGIN A NEW LIST,ADD OR EDIT RECORDS
6010 DATA SAVE THE LIST TO DISK
6020 DATA LOAD A LIST FROM DISK,SEARCH FOR A RECORD
6030 DATA PRINT THE LIST,DISPLAY THE DISK CATALOG
6040 DATA QUIT,NAME,STREET,CITY,STATE/ZIP,REMARKS
```

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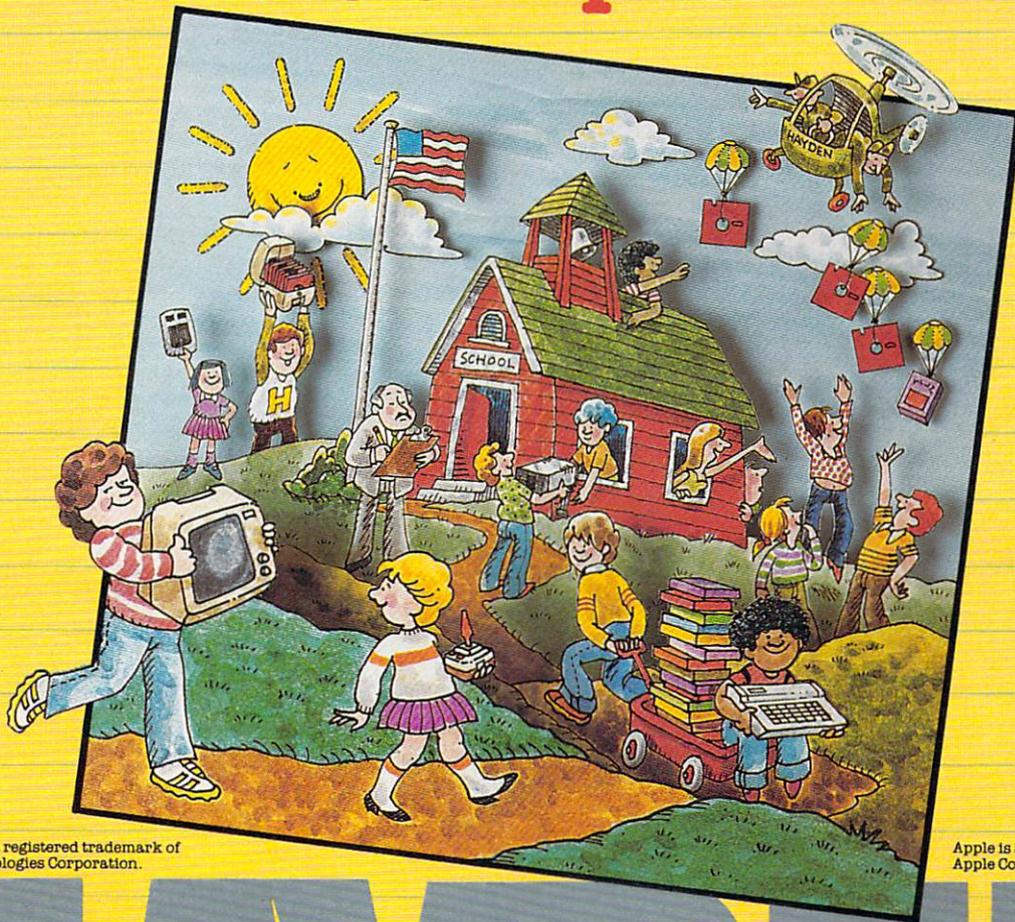
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Sir Clive Sinclair is the British inventor who introduced the Sinclair ZX-81 computer in Britain and brought the price down to an affordable level. The ZX-81 was later sold in the U.S. as the Timex 1000.

Timex quit the computer business after trying to redesign Sir Clive's Spectrum computer as the TS 2068.

The Sinclair QL has a 32-bit Motorola 68008 microprocessor, which handles data much faster than the 8-bit chips found in many computers; 128K of RAM, which can be expanded to 640K; and a full-size 65-key keyboard.

Four software packages are included with the QL: a word processor, a spreadsheet, a data-base, and a graphics program.

Data is stored on two built-in mi-



crodrives, each with a memory capacity of more than 100K. Sinclair officials claim the microdrives are 10 to 20 times faster than a cassette system and are even a little faster than some floppy disk drives. However, little software has been written for the microdrive format.

MISCELLANEOUS

Ensoniq Drum-Key (Apple)

MANUFACTURER: Ensoniq Corp., 1 Great Valley Parkway E., Suite 10, Malvern, PA 19355; (800) 441-1003
PRICE: \$139 (includes postage and handling)

If you've always wanted to play the drums but can't keep a beat, you can make your Apple II sound like Ringo Starr with the Ensoniq Drum-Key.

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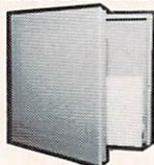
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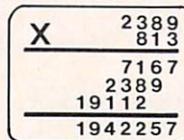
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IBM PCjr Enhancements

MANUFACTURER: IBM Corp., 1845 S. Federal Highway, Delray Beach, FL 32444; (305) 241-6007

PRICE: Color Display, \$429; Keyboard, free; 128K Memory Expansion Attachment, \$325; Speech Attachment, \$300

In two separate announcements, IBM has introduced a whole line of new PCjr products that turn the often-criticized computer into a powerhouse. First, the rubberized, "Chiclet" keyboard that had unmarked keys, which many found difficult and annoying to use, has been replaced by a more standard typewriter-style keyboard. All owners who

bought the PCjr with the old keyboard are entitled to a free replacement.

Second, the 128K Memory Expansion Attachment (\$325), which plugs into the computer's side, increases user memory by 128K. It can be connected directly to any PCjr with 128K and a disk drive. When the Power Expansion Option, also an external plug-in board, is attached, two more 128K expanders can be added. Thus, the user memory (RAM) can be expanded to 512K, which gives the PCjr enough power to run virtually all the best-selling business programs that run on the IBM PC.



In addition, any part of this user memory can be turned into an "electronic disk drive." This means that a program can be loaded into RAM, and then accessed as if it were in the disk drive. The electronic disk drive is also at least five times faster than a standard disk drive.

The IBM Color Display, designed for the IBM PC, can be used on the PCjr. But the new PCjr version of the color display is significantly less expensive (\$429), and provides nearly the same high-resolution color-graphics capability. It can display 16 colors, and can be used for word processing in an 80-column mode. The new IBM monitor is designed to be placed right on top of the PCjr system (you cannot do that with non-IBM monitors), and also includes an internal speaker and an earphone connector.

The PCjr Speech Attachment (\$300), which also plugs into the unit's side next to the memory expanders and parallel printer attachment, has 196 prerecorded words and sounds. These can be used by software developers for games or educational packages. There's a jack for a microphone, so that you can speak to the computer and hear a playback of your voice. This speech can be recorded on a disk. 

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Now two of the most popular types of business programs are available for the home. Created by the co-developer of the best-selling Bank Street Writer, these programs use simple menus and prompts instead of commands. Plus an exciting new breakthrough "learn-by-practicing" technique to teach both students and adults practical computer literacy skills.

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WHAT'S IN STORE SOFTWARE GUIDE

QUICK TAKES ON SOFTWARE— NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart.

Here's a rundown of the rating categories and what they mean: **●** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system, in the games reviews, the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS/HOME MANAGEMENT

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				●	D	EH	GQ	EU	V
CREATIVE CALC Creative Software 230 E. Caribbean Drive Sunnyvale, CA 94089 (408) 745-1655 \$49.95 © 1984	Chart expenses and budgets for home, small businesses, clubs, etc. with electronic spreadsheet that simulates accountant's ledger book. † —ODISIO	Reviewed on C 64 (d.). Also for Apple II series, 48K (d.); IBM PC/PCjr, 64K (d.).	90-day warranty; \$15 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
SKIWRITER II Prentice-Hall Subsidiary Rights Dept. Englewood Cliffs, NJ 07632 (201) 592-2629 \$69.95 © 1984	High-school students, small businesses, home users, can word-process papers, reports, correspondence, even transmit them over telephone lines, using built-in telecommunications program. † —WOODS	Reviewed on C 64 (cart.). Version planned for IBM PCjr. Modem.	90-day warranty.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
SMARTFILER Coleco Industries Inc. 999 Quaker Lane S. West Hartford, CT 06110 (800) 842-1225 \$24.95 © 1984	File, retrieve, and print up to 180 records of 255 characters in length (more if records are shorter) in electronic file system which lets you sort data in a variety of ways. Merge mailing lists with ADAM's SmartWriter. —DAVENPORT	Coleco ADAM (cass.).	6-month warranty.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
WOMEN'S WARE Neon Software Co. 55 High St., P.O. Box 1540 Middletown, CT 06457 (203) 346-6322 \$49.95 each; (Freefile, \$79.95) © 1984	Seven home-management programs for recipes, telephone numbers and addresses, budgets, checkbook, appointments, and other filing needs. Uniform design makes programs easy to master. † —RASKIN	IBM PC/PCjr, 128K (d.).	2-year warranty.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
THE WRITE CHOICE Roger Wagner Publishing, Inc. 10761 Woodside Ave., Suite E Santee, CA 92071 (619) 562-3670 \$44.95 © 1984	Write and edit letters, papers, and reports with elaborate word processor. Includes typing tutorial; utility that analyzes your documents for average word length, number of words used, etc.; and plenty of extra literature regarding writing style. —LINCOLN	Apple II series, 48K (d.).	30-day warranty. User makes backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★

RATINGS KEY ● Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

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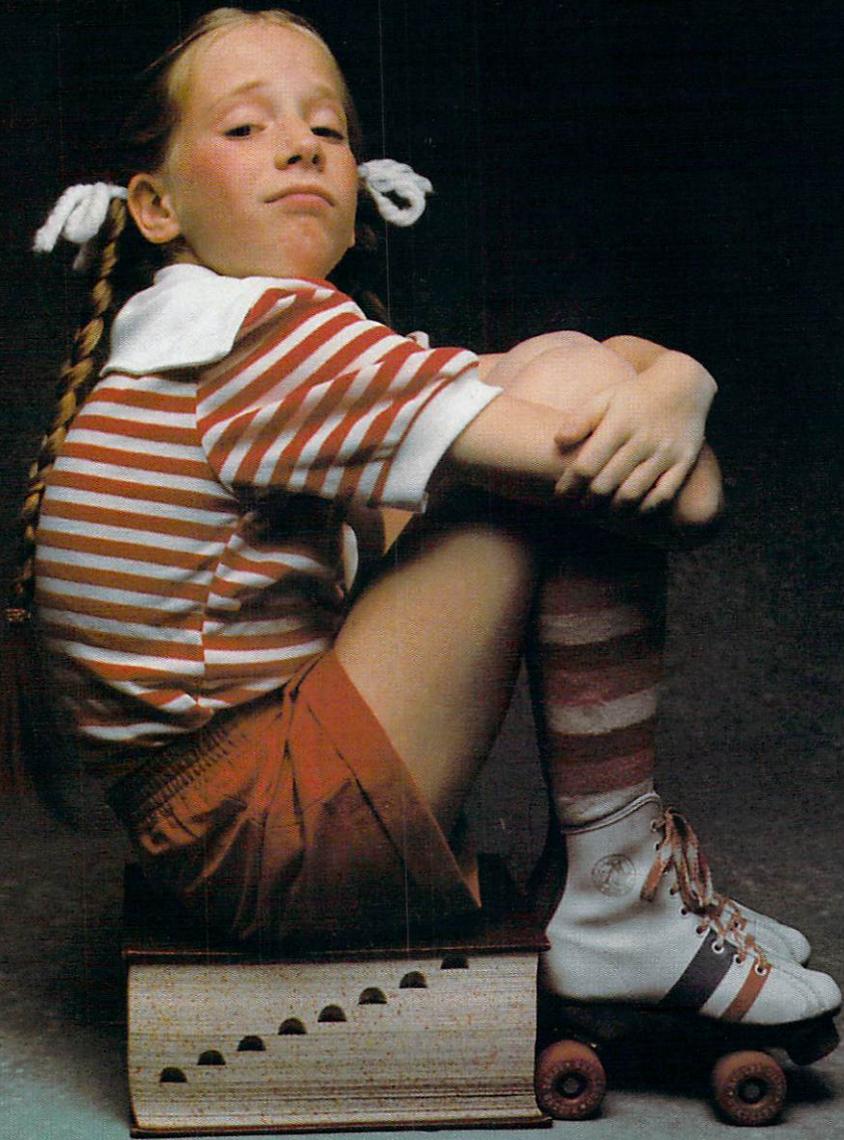
WHAT'S IN STORE SOFTWARE GUIDE

EDUCATION/FUN LEARNING

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
BUMBLEBEE Creative Software 230 E. Caribbean Drive Sunnyvale, CA 94089 (408) 745-1655 \$29.95 © 1983-84	Young school-age children use simple directional commands to program bee through a maze in search of pollen. Avoiding obstacles and enemies is fun for the whole family. † —BYRNE	Reviewed on C 64 (d.). Version planned for IBM PC/PCjr and Apple II series. Joystick.	90-day warranty.	★	★	★	★	E	★
COOKIE MONSTER'S LETTER CRUNCH Children's Television Workshop/Radio Shack 1800 One Tandy Center Fort Worth, TX 76102 (817) 238-2393 \$19.95 © 1983	Four entertaining games reinforce spelling and word recognition at six levels. 3-6-year-olds will need parental help. Difficult words make it best for 6-10 age group. —HYER	TRS-80 CoCo, 16K (cass. w/Extended BASIC). Joystick.	30-day warranty.	★	★	★	★	D	★
D-BUG Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171 \$35 © 1983	A computerized strategy game is interrupted by ailing computer part. Go into the machine and figure out what's bugging it. Learn how to relate symptoms to computer problems. —LAMB	Reviewed on Atari Home Computers, 48K (d.). Also for C 64 (d.). Joystick.	90-day warranty; \$7.50 fee thereafter.	★	★	★	★	A	★
DINOSAURS Advanced Ideas Inc. 2550 Ninth St., Suite 104 Berkeley, CA 94710 (415) 526-9100 \$39.95 © 1984	Prereaders match dino shapes, divide them into herbivores and carnivores, place them in their proper habitats, and match them with names in colorful activities. † —BUMGARNER	Reviewed on Apple II series/Apple III, 48K (d.). Version planned for C 64.	1-year warranty; free backup w/ return of registration card.	★	★	★	★	E	★
DINOSAURS! Cross Educational Software 1802 N. Trenton St. P.O. Box 1536 Ruston, LA 71270 (318) 255-8921 \$15 © 1981	Children ages 9 and up learn dinosaur names and facts. Package includes a primitive graphics program and simple arcade game. † —BUMGARNER	Apple II series, 48K (d.).	Lifetime warranty; \$5 fee if user-damaged; user makes backup copy.	★	★	★	★	E	★
SUCCESS WITH MATH: DECIMALS: 1) ADDITION/ SUBTRACTION 2) MULTIPLICATION/ DIVISION CBS Software One Fawcett Place Greenwich, CT 06836 (203) 622-2525 \$24.95 each © 1984	Addition, subtraction, multiplication, and division of decimals tutor students in grades 5-8, or anyone who wants help in these areas. Programs provide advice and detailed instructions as well as practice problems in different skill levels. † —MORRIS	Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d. and cass.).	90-day warranty; \$5 fee thereafter or if user-damaged.	★	★	★	N/A	E	★
TYPING TUTOR III WITH LETTER INVADERS Simon & Schuster/ Kriya Systems 1230 Ave. of the Americas New York, NY 10020 (212) 245-6400 \$49.95 © 1984	Students of all ages improve typing skills with programs that monitor progress—testing only those keys with which user needs help. Arcade practice program provides break from drill. † —BUMGARNER	Reviewed on IBM PC, 64K (d.). Also for Apple II series, 48K (d.); C 64 (d.). Version planned for Macintosh.	30-day warranty; \$5 fee thereafter (for one year) or if user-damaged.	★	★	★	★	A	★
WIZTYPE Sierra, Inc. P.O. Box 485 Coarsegold, CA 93614 (209) 683-6858 \$34.95 (d.) \$39.95 (C 64 cart.) © 1984	Zap letters and words off the screen or be zapped in this fun typing tutorial with many skill levels you set yourself. Entertaining "Wizard of Id" character adds to its pace. † —MORRIS	Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d. and cart.); IBM PC/PCjr, 128K (d.).	90-day warranty; \$5 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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GAMES REVIEWS BY JAMES DELSON

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	PS	GQ	EU	V
BOULDER DASH Micro Lab 2699 Skokie Valley Road Highland Park, IL 60035 (312) 433-7550 \$40 (Apple, ADAM) \$35 (C 64) © 1984 Atari and IBM versions from First Star Software.	Move hero through the earth, dig holes, avoid falling boulders and other dangers, seek out jewels in delightful, challenging arcade game, easy enough for novices, but challenging for pros, ages 8+.	C 64 (d.). Also for Apple II series, 48K (d.); ADAM (cart.); Atari Home Computers, 48K (d.); IBM PC/PCjr, 64K (d.). Joysticks.	30-day warranty; \$5 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
COMPUTER DIPLOMACY Avalon Hill Game Co. 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 \$50 © 1984	Adaptation of great political/strategy board game good for newcomers to such games. Computer controls up to seven opponents and acts as a first-rate bookkeeper, for ages 10+.	IBM PC, 256K (d.).	Lifetime warranty.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
DONKEY KONG Atari 1312 Crossman Road Sunnyvale, CA 94089 (408) 745-2000 © 1983 Price not available at press time; consult local stores.	Send Mario the carpenter up into a construction site to rescue his girlfriend from the clutches of Donkey Kong. Dodge rolling barrels, avoid fiery obstacles, collect prizes for hours of fun, for ages 8+.	Reviewed on Atari Home Computers, 48K (d. and cart.). Also available for Apple II/II plus/IIe, 48K (d.); C 64 (d.); IBM PC/PCjr, 64K (d.). Joysticks.	Not available at press time.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	N/A
JACK ATTACK Commodore Business Machines 1200 Wilson Drive West Chester, PA 19380 (215) 431-9100 \$29.95 © 1984	Block, trap, push, and pull Jack to squish the attacking heads that shower from the sky. Easy joystick control appeals to younger kids; 64 levels challenge experts.	C 64 (cart.). Joystick.	Defective cartridges replaced free w/in 90 days; \$15 thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
MASK OF THE SUN Broderbund Software 17 Paul Drive San Rafael, CA 94903-2101 (415) 479-1170 \$39.95 © 1984	Limited animation sequences, tough puzzles, and a few wild-goose chases make this four-sided super text/graphic adventure game good for group play.	Reviewed on Atari Home Computers, 48K (d.). Also for C 64 (d.); Apple II series, 48K (d.).	Lifetime warranty; \$5 fee if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★
QUESTRON Strategic Simulations, Inc. 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$49.95 © 1984	Appointed as protector of a kingdom in peril, you set out, combatting monsters and gaining strength and treasures in solo role-playing game derived from the <i>Ultima</i> series.†	Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 40K (d.). Version planned for C 64. Joystick.	30-day warranty; \$10 (plus \$2 shipping) fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
RAILS WEST! Strategic Simulations, Inc. 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$39.95 © 1984	One to eight human or computer players jockey to become America's greatest 19th-century railroad baron. Difficult but involving challenge requiring up to 50 hours, for ages 12+.	Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 40K (d.).	30-day warranty; \$10 (plus \$2 shipping) fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★
RALLY SPEEDWAY Adventure International P.O. Box 3435 Longwood, FL 32750 (800) 327-7172 \$49.95 © 1983	One of the most flexible, challenging car-racing games around. Build your own courses, then send car around to test the track. Good for ages 8+.	Atari Home Computers, 16K (cart.). Joystick.	1-year warranty; \$5 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
RUN FOR THE MONEY Scarborough Systems, Inc. 25 N. Broadway Tarrytown, NY 10591 (914) 332-4545 \$39.95 © 1984	Fast, fun, financial-simulation game with arcade elements and amusing graphics in a fanciful setting. Introduces basics of economics while pleasing the whole family. For ages 12+.	Reviewed on IBM PC, 64K (d. w/DOS 1.1 and color card). Also for Apple II series, 64K (d.); Atari Home Computers, 64K (d.); IBM PCjr, 128K (d. w/DOS 1.1). Joysticks.	30-day warranty; \$5 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
SOLO FLIGHT Microprose Software 10616 Beaver Dam Road Hunt Valley, MD 21030 (301) 667-1151 \$34.95 © 1984	Serious flight simulator puts you in the cockpit of a light plane. Take off, navigate, and land successfully. Challenging game tests the skills you've acquired in practice sessions.	Reviewed on Atari Home Computers, 48K (d. or cass.). Also for Apple II series, 48K (d.); C 64 (d. or cass.). Version planned for IBM PC/PCjr, 64K (d.).	90-day warranty; \$10 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	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

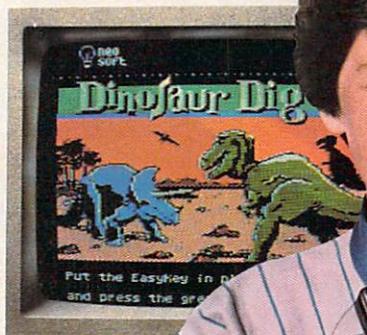
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WHAT'S IN STORE SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page No. 108 for information such as backup policies and addresses of software manufacturers.

HOME BUSINESS/ HOME MANAGEMENT

Creative Calc

HARDWARE REQUIREMENTS: Reviewed on Commodore 64 (disk). Also for Apple II series; IBM PC/PCjr.
MANUFACTURER: Creative Software
PRICE: \$49.95

	1983	percent	1984
INCOME			
Entry Fees	398.00	94.00	424.00
Memb. fees & Misc.			236.42
Carried Fwd.	26.78	6.00	113.00
Total Income	416.78		773.42
EXPENSES			
Print. Inv.			
Prog. Regis.			
Newsletters	133.76		
Postage	28.22		
Panel Rent	58.80		
Hosp. Table			

Electronic spreadsheets are difficult-to-master calculation programs. You create rows and columns of numbers which can then be added, subtracted, multiplied, averaged—manipulated so that totals instantly change if any relevant figures are altered. These kinds of programs are most useful in business settings—situations in which you might want to prepare budgets with a number of variables. *Creative Calc* is a slimmed-down version of spreadsheets you're likely to find in any computerized office or business. It may not have some of the fancier options available in programs costing in the hundreds of dollars, but its price and its general simplicity make it well-suited to many tasks you take care of at home.

With *Creative Calc*, you can project your family's budget. For instance, what would happen if we decided to stay home instead of going on vacation? What if we saved \$50 a week instead of \$35? These "What ifs" are handled instantly and easily. I used the program to formulate an expense comparison for the Spectral Artists, an arts organization that mounts a major art exhibit here in Mesa, Arizona, each year. With for-

mulae I entered myself, *Creative Calc* added totals, subtracted expenses, and figured the balance. It calculated the averages and percentages of total expense for each item. Then it helped me figure an '85 budget. With a few hours' worth of getting acquainted with the program, it took me less than one hour to work out this simple budget.

For the most part, it's easy to use, in spite of incomplete documentation. It helps to type all formulae in parentheses, for instance. If you don't, the computer will "think" you're typing in a label or text, even though this isn't made clear in the manual. (Note: We had trouble with the INSERT feature. Adding a row at the top of the spreadsheet for a title, for instance, threw off formulae we'd entered originally. Subsequent versions of the program don't have this bug and owners of earlier copies can replace flawed disks with revised ones. We're also told a new, more complete version of the manual, including tutorials to help you get used to the program, is on its way.)

In spite of the few obstacles I encountered, and managed to overcome with a little persistence, I'd rate *Creative Calc* a fine program, worthy of consideration by anyone who's ever tried to budget and thought, "What if. . . ?"

—NORMA ODISIO

SkiWriter II

HARDWARE REQUIREMENTS: Commodore 64 (cartridge). Version planned for IBM PCjr.
MANUFACTURER: Prentice-Hall
PRICE: \$69.95

There's a new generation of word-processing software. It's less expensive, easier to use, and allows you much of the power you'd expect from programs costing a good deal more. *SkiWriter II* not only gives you a lot of word-processing power, it also gives you a complete telecommunications program. If you have a modem, you can hook up your computer to the telephone and transmit letters or documents which you created with *SkiWriter* to other computers. Or you can make use of versatile "information services," such as CompuServe and The Source.

Simply insert the cartridge (no need to wait for Commodore's lengthy loading period), turn on the computer, and you arrive at the main list or menu of operations.

Touch the space bar to move to one of the functions you want to perform. With an easy-to-understand, clearly organized manual, any new user should be able to produce a simple document within a half hour. Underline, center, and justify the right margin of your text by selecting from a list similar to the main menu. When you've finished composing and editing your work, you can preview all of it, or selected pages, to see how it will appear on paper when printed out.

An extra special feature of *SkiWriter's* lets you hook up to other computers through the telephone. If you're using an information service you can use the material you obtain and then edit it with the program.

SkiWriter II is ideal for personal and small business use—especially for people who wish to transmit or receive information over the telephone. From a high-school student who may be using a modem for research and reference material, to busy executives who want the latest stock information in a snap, *SkiWriter II* is perfect, and reasonably priced.

—JOYCELYN SUE WOOD

Women's Ware

HARDWARE REQUIREMENTS: IBM PC/PCjr, 128K.
MANUFACTURER: Neon Software Co.
PRICE: \$49.95 each; \$79.95 for *Freefile*

Each of the seven Women's Ware packages is a data-base management system targeted for women and tailored for a particular use:

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Freefile. Store, retrieve, and sort through large amounts of information.

The seven packages, with their different applications, have a lot in common. They are all extremely easy to use, and virtually self-explanatory. Uniform commands are used in all packages. In each case I was up and running, and typing in data in a matter of minutes. The documentation is clear, though sometimes too chatty.

Generally, the programs are quite

good and have a valid place in many homes (although you may have trouble, as I did, justifying the usefulness of a filing system for your house plants and home furnishings, as suggested in *Freefile's* documentation). There are a few limitations regarding each package's size and flexibility. Nowhere, for instance, did I find mention of how many records these programs could handle (how many checks or addresses I could enter). *Freefile's* categories were frequently too short for information I wanted to file. Also, once you design a format in the filing program, and finalize the way you enter information and get it back, there's no changing it.

For busy women (and men), time is worth money, but how much? I could construct a perfectly adequate calendar, directory, or inventory program using *Freefile* alone. Better yet, for the price of these packages combined, I could get a bigger program, like *Lotus 1-2-3*, capable of doing zillions of things. It may be harder to use, but once mastered, it's more useful.

Women's Ware is fine, if you can justify the need. If you want one or two of the packages and don't want to be bothered with fancier business software, then splurge on the separate packages. If you need three or four applications then consider *Freefile*, or another data-base management program.

—ROBIN RASKIN

Education/ Fun Learning

Bumblebee

HARDWARE REQUIREMENTS: Commodore 64 (disk). Versions planned for Apple II series; IBM PC/PCjr. Joystick.
MANUFACTURER: Creative Software
PRICE: \$34.95

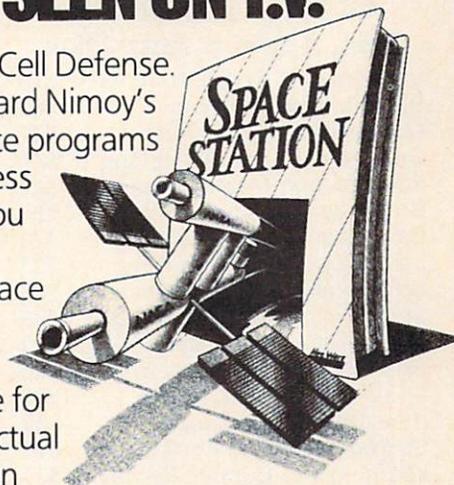
Bart the Bumblebee and his adversaries, Phineas the Frog and Olga the Spider, provide hours of brain twisting for players of this new game. Though I presented it to our younger ones, even the aloof teenagers have taken time out of their important social activities to try their hand at guiding Bart through the on-screen maze. You must get Bart to the flowers and pollen and back to his hive using simple directional commands like "W" for west and "N" for north, followed by a number indicating distance.

Bumblebee is easy enough for 5-

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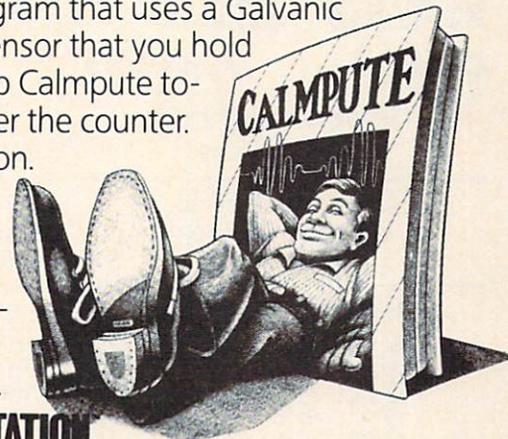
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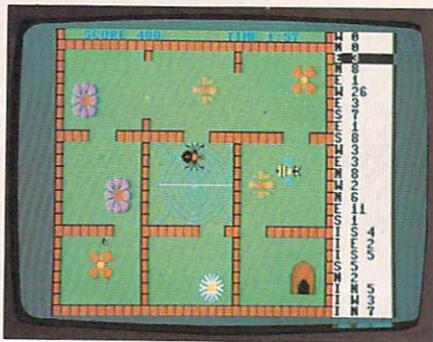
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SOFTWARE REVIEWS



or 6-year-olds at the first levels, while it challenges older players in the more advanced stages. The higher the level, the more predators and obstacles Bart has to circumnavigate. At Level 7, Olga and her web block Bart's path, necessitating the use of a fancy IF SAFE command, like the IF... THEN programming statements Dad uses. If kids tire of programming Bart, they can opt to play with the joystick.

Just like the computer, this bee doesn't think for himself. He'll follow all your commands literally. If you wind up crashing into a wall, then an error screen displays a newspaper headline such as BEE HITS WALL OR WALL STOOD BETWEEN BEE AND VICTORY. (BASIC and Logo error messages were never this much fun.) Successful efforts rate more upbeat announcements and a display of your score.

My kids return to this game again and again—sometimes for day-long bouts. I'm satisfied because they're exploring directions, the concept of sequencing, and getting a bit of programming in at the same time.

—BETSY BYRNE

Dinosaurs

HARDWARE REQUIREMENTS: Reviewed on Apple II series, 48K (disk). Also for Apple III. Version planned for Commodore 64.

MANUFACTURER: Advanced Ideas
PRICE: \$39.95

Dinosaurs!

HARDWARE REQUIREMENTS: Apple II series, 48K (disk).

MANUFACTURER: Cross Educational Software
PRICE: \$15

Dinosaurs fascinate kids and these two programs capitalize on that interest. Advanced Ideas' program, targeted for kids as young as 2½ years old, uses six simplified dino shapes in four matching games that reinforce shape recognition and visual

memory skills.

By pressing the horizontal keys, kids move a bouncing ball to pictures representing four different activities. They can opt to match shapes, divide the dinos into herbivores and carnivores, put the dinos in their correct habitats (air, land, or water), or match the dinos with their names.

Playing is easy for young ones; it requires the use of only the horizontal cursor keys, the space bar, and the RETURN button. However, kids up to about 4 will need the help of adults. (I'd never counsel a parent to leave their 2- or 3-year-old all alone in front of the computer, anyway.) They'll need help overcoming a few confusions which might pop up—the use of the horizontal keys to select from a menu of choices arranged vertically; and the fact that in the habitat game, the water environment is sandwiched between air and land, making the land seem to be under water. Once these illusions are explained, the problems evaporate.

Kids older than 4 enjoyed learning which dinos ate plants and which ones ate animals. They liked discovering the habitats and matching the



animals' long names with their pictures. Younger kids used the accompanying coloring book to find the names and then match them on-screen. And they loved the colorful dinosaur parade that greeted their successful completion of an activity. A bibliography of dinosaur books, a glossary of terms, and suggestions for related activities further rounds out this package.

Another program, *Dinosaurs!*, is best-suited for children over 9, though there is one activity in which preschoolers can paste and erase dinosaurs on a colorful primitive scene.

With a matching game that teaches the names of 10 dinosaurs all displayed and drawn to scale, and an

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SOFTWARE REVIEWS



animated version of Hangman, players will really find themselves learning the names of such creatures as the Stegosaurus and Pteranodon. The simple little arcade game was a hit with kids, who controlled the Tyrannosaurus Rex in fending off fire-breathing Brontosaurus (a bit of re-interpreted dinosaur history, there!).

Perhaps the program's most valuable aspect is a simple graphics program that users break into and change. One graphics program is accompanied by notes which novice programmers can use to readjust the program. Or they can refer to them to create scenes like those used in the package.

Who says dinosaurs are extinct? Our family found they're alive and well and motivating kids to learn with the computer.

—MARLENE ANNE BUMGARNER

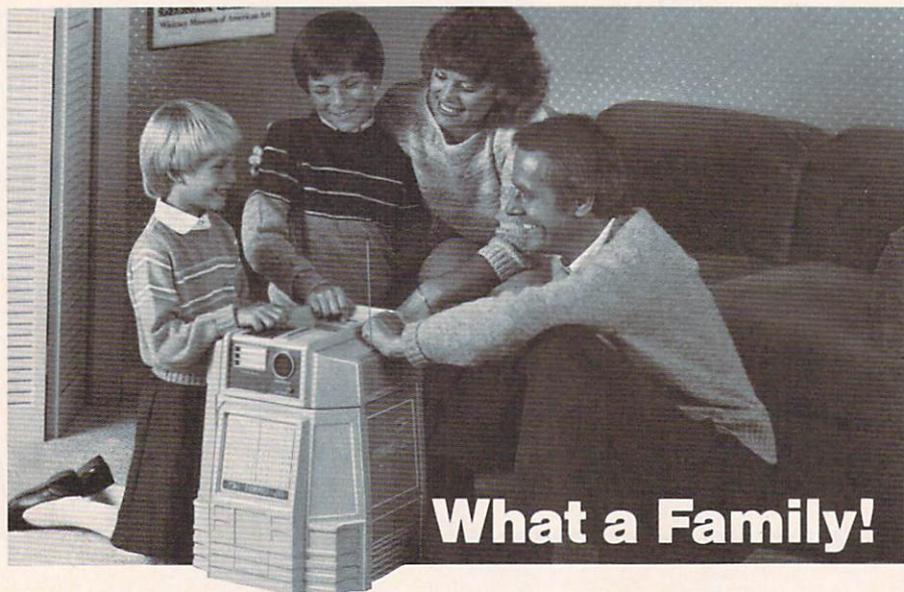
Success With Math

Decimals: Addition/Subtraction; and Decimals: Multiplication/Division

HARDWARE REQUIREMENTS: Reviewed on Apple II series. Also for Atari Home Computers; Commodore 64.
MANUFACTURER: CBS Software
PRICE: \$24.95 each

We've all had trouble with math at one time or another. Remember laboring over those workbooks, trying to make sense of it all? Those days are gone with CBS Software's Success with Math *Decimals* packages. These two programs tutor students in the addition, subtraction, multiplication, and division of decimals. Though they're both intended for children in grades 5 through 8, anyone of any age who has trouble with decimals can learn from these programs.

First of all, the packages provide practice problems. Since they're generated randomly, the number of different ones you may be asked to solve is virtually unlimited. —▶



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SOFTWARE REVIEWS

But each of these programs is more than a computerized workbook filled with practice programs. It's a tutor that actually teaches you, step by step, how to deal with decimals. It then watches over your shoulder and provides advice as you work on problems yourself. Written documentation is brief but complete. The programs themselves each contain clear, detailed instructions followed by a practice problem that you solve a step at a time with guidance from the computer.

If you make a mistake, either in your approach or in the math itself, the computer provides hints and then waits patiently for you to respond correctly before it proceeds. At the end of each problem, you get a detailed evaluation of your errors. With one on division, for instance, you'd get feedback in decimal placement, division errors, multiplication errors, errors in carrying, etc. If necessary, you can go back to the instructions to review rough spots.

There are no gimmicks here to attract and hold your attention—no spaceships to destroy or aliens to chase. But for good, solid tutoring in a specific area, give these packages a try.

—TONY MORRIS

Typing Tutor III with Letter Invaders

HARDWARE REQUIREMENTS: Reviewed on IBM PC, 64K (disk). Also for Apple II series and Commodore 64. Version planned for Macintosh.

MANUFACTURER: Simon & Schuster Electronic Publishing Group/Kriya Systems Inc.

PRICE: \$49.95

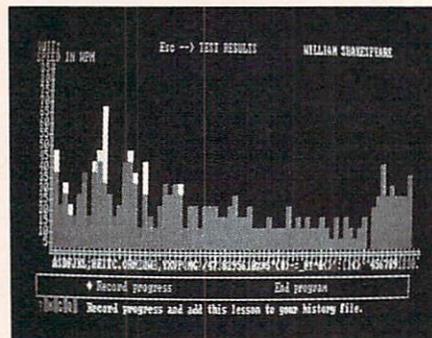
Keyboard skills are essential for anyone working with computers. My 11-year-old daughter, Dona, tried to teach herself to type one summer, using some records and a textbook we found in the library. By the time she began with *Typing Tutor*, she already knew the home row of keys and had developed some speed and accuracy on them.

Typing Tutor III wasn't written for kids, but they can certainly use it. It will appeal to adults who want a good solid lesson and to children who shy away from the arcade approach to typing lessons found in programs like *WizType* (see review below) and *MasterType* (see the review in the March FAMILY COMPUTING).

A thorough introductory tutorial starts you off, guiding you through all the elements of the package. The screens are a bit dense with text

here, which makes it tough to follow, but they can be skipped altogether.

The program provides drill-and-practice with the alphabet and number keys. As you improve on the first keys, it gives you more difficult ones to type. The better you get, the more it concentrates on your weaknesses, thanks to a mechanism called "Timed Response Monitoring." Dona enjoyed sessions with this highly interactive program. It frequently tells



her how fast she's typing, what her accuracy rate is, and which letters she's mastered. The program also immediately notifies her of errors by placing a little ^ (caret) underneath the blooper. The program records her progress so she can resume where she left off. Colorful graph displays indicate accuracy and speed. Dona can really track her accomplishments. I can even write new testing material—sentences and words to prevent her familiarity with the text from skewing her test scores. (IBM version only.)

Letter Invaders provides a pleasant break from the dry drills. Letters shower from the sky exploding as you type them in correctly. I beat the computer at 115 words per minute in the LETTERS ONLY typing test. But when the program added special characters I didn't know, it pressed me to my limits.

—MARLENE ANNE BUMGARNER

(Note: *Typing Tutor III with Letter Invaders* is the most recent in a line of *Typing Tutor* programs. It is the only one that combines "Timed Response Monitoring" with both highly interactive charts and graphs, and an arcade game.)

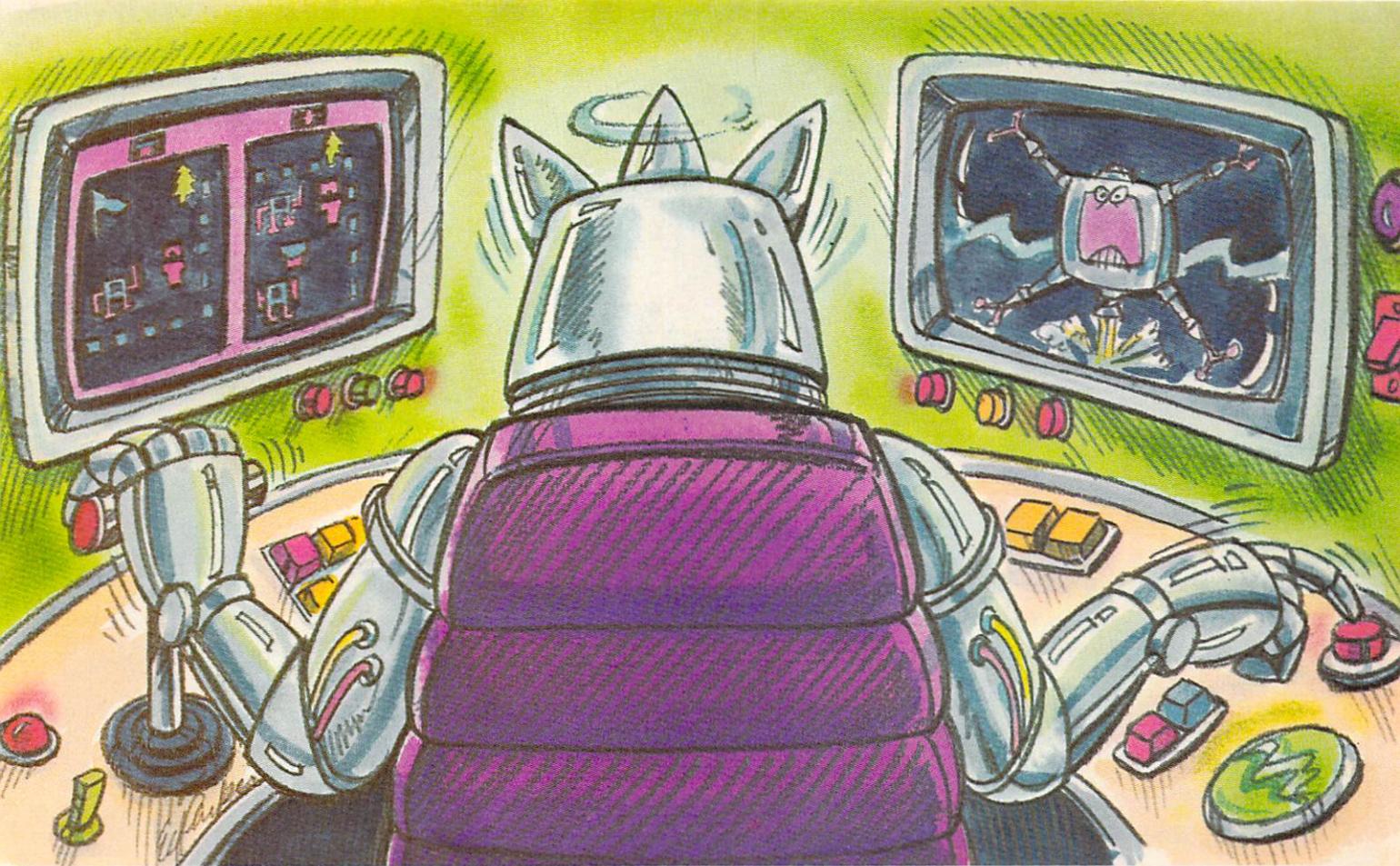
WizType

HARDWARE REQUIREMENTS: Reviewed on Apple II series, 48K (disk). Also for Atari Home Computers; Commodore 64; IBM PC/PCjr.

MANUFACTURER: Sierra, Inc.

PRICE: \$34.95

\$39.95 (C 64 cartridge)



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

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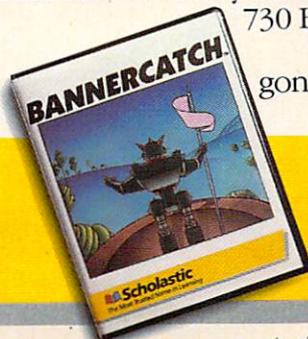
You'll battle Max and his robot marauders in a field bigger than any you've ever seen. Your team must invade robot territory and grab their flag before they take yours. But be careful; Max has devised a fiendish strategy against you. And, of course, you can't expect mercy from robots.

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

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

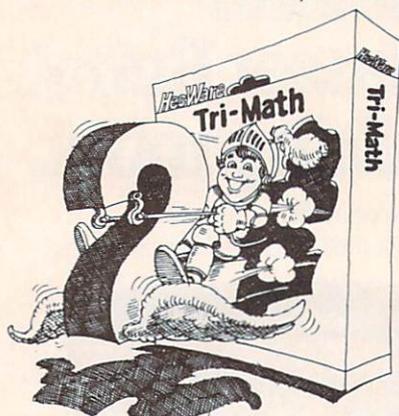
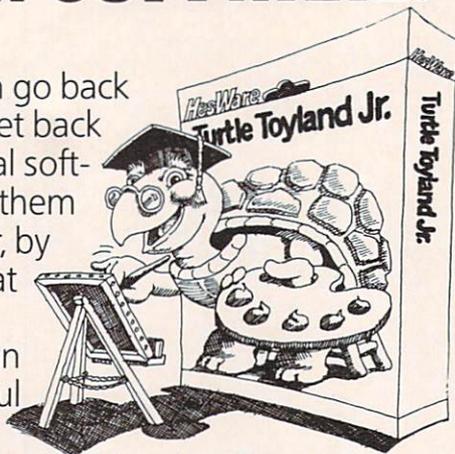
But please remember, only a handful of people have gone face-to-face against Max and survived.



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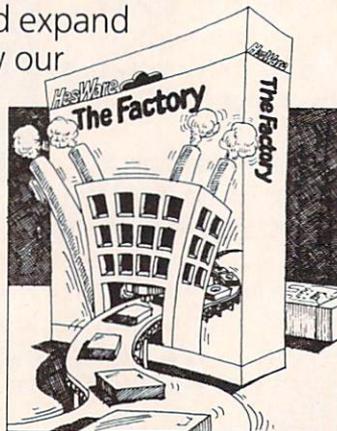


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Commodore 64 and Apple



SOFTWARE REVIEWS

Learning to touch-type can be about as much fun as pulling weeds. *WizType* sets out to change that. The comic strip character, Wizard of Id, becomes your partner in a frantic game of "zap or be zapped." Each time you type a word correctly, the Wizard zaps it off the screen. More words take their places, and unless you keep up, the Wizard gets fried.

The program begins by teaching where each key is located and the proper fingers to use. Practice material varies, but while you're learning,



you can set the speed at which material appears to fit your own pace. This is an especially desirable feature for young children.

Once you can type single characters at about 20 words per minute, you move on to nonsense syllables, and then words and paragraphs. After having mastered these basics, you move on to the game. Scores here are stored on the disk so you can measure your improvement. By returning periodically to the basic drill-and-practice lessons, you'll be able to build up speed and accuracy well beyond the minimal 20-words-per-minute level.

WizType is a strong contender in the touch-typing tutorial field. Many kids enjoy the challenging arcade pace. Another strong feature is that the program will teach either the standard QWERTY keyboard prevalent today, or the new Dvorak keyboard that's growing in popularity. (For some reason, however, the instruction manual doesn't explain the difference between the two.)

—TONY MORRIS

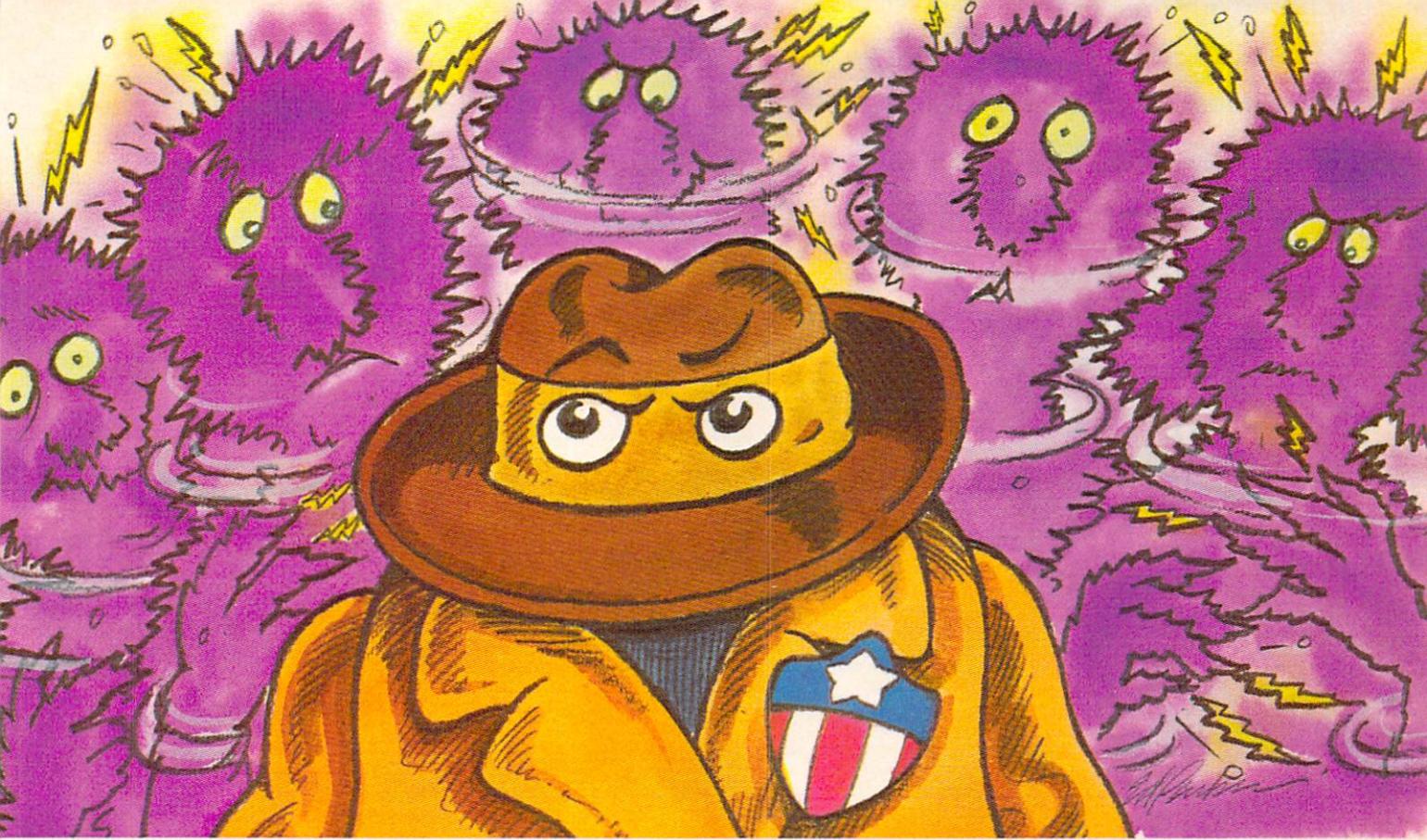
GAMES

Computer Diplomacy

HARDWARE REQUIREMENTS: IBM PC, 256K (disk).

MANUFACTURER: Avalon Hill Game Co.

PRICE: \$50



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

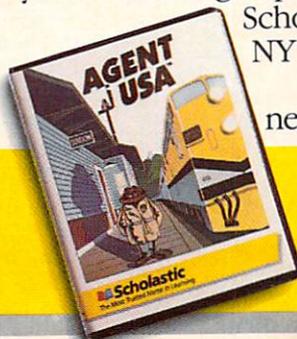
The FuzzBomb is turning millions of men, women and children into mindless fuzzbodies. And Agent U.S.A. can't stop the devious plague spreader without your help.

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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- (Atari, C-64) Challenging learning game combines planning skill with musical awareness. Ages 8-adult.
- LIGHT WAVES 37.95 **29**
- (Atari, C-64) Children determine—and must then observe—the rules in this a-mazing mindgame. Ages 10-adult.
- MASTERING THE SAT 150.00 **110**
- (not Atari) Developed in cooperation with the National Association of Secondary School Principals.
- MATCH-WITS 29.95 **24**
- (not IBM PC jr.) Strengthens concentration and memory skills. Ages 7-adult.
- MATH MILEAGE 37.95 **29**
- (Atari, C-64) Develops arithmetic, planning and estimation skills—quickly! Ages 7-12.
- MURDER BY THE DOZEN 34.95 **27**
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- (Apple) Develops abstract and complex thinking skills. Ages 8-13.
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- concepts and other critical reading and math readiness skills. Ages 3-6.
- MAGIC SPELLS 34.95 **\$27**
- A magical mystery tour that leaves kids spellbound. Ages 6-10.
- MOPTOWN HOTEL 39.95 **31**
- Children learn advanced problem-solving skills. Ages 8-13.
- MOPTOWN PARADE 39.95 **31**
- Playful Muppet characters help children develop strategic thinking skills. Ages 6-10.
- NUMBER STUMPER 39.95 **31**
- (Apple, IBM) More than just adding and subtracting, this program develops abstract reasoning and strategic thinking skills. Ages 6-10.
- READER RABBIT 39.95 **31**
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- ROCKY'S BOOTS 49.95 **39**
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- WORD SPINNER 34.95 **27**
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- AGENT U.S.A. 39.95 **\$31**
- BANNER CATCH 39.95 **31**
- DOUBLE FEATURE ADVENTURE 24.95 **19**
- (Apple, C-64, IBM)
- DOUBLE FEATURE MYSTERY 24.95 **19**
- (Apple, C-64, IBM)
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- MANAGING YOUR MONEY 199.95 **149**
- (Apple, Atari, IBM)
- MAXELL DISKS (152D, Box 10) 46.50 **22**
- SENTINEL DISKS (152D, Box 10) 36.50 **18**

SOFTWARE REVIEWS



The board game Diplomacy is one of the all-time great political/strategy games. A simulation of European power politics at the turn of the 20th century, it's based on the strategies of competition that traditionally arise among nations. Political pressure, backroom deals, overt warfare, subversion of alliances, and a lust for power all play crucial roles in this contest.

The board game's main attraction, but also its chief failing, is its complicated play system, designed to accommodate seven players or teams. Participants try to accumulate power and territory for major European powers, circa 1901.

The computerized version of this fascinating game is an immense improvement in this regard. Unfortunately, however, even using 256K of memory, Diplomacy's computerized counterpart is only a shadow of the original. For one thing, player interaction, scheming against one another, and ingenious wheeling-and-dealing are crucial elements of the board game. Such interaction is minimized in contests with the computer. Computer-controlled countries only execute minor, easy-to-beat military strategies.

In spite of these drawbacks, the game does have advantages. For example, the computer acts as a book-keeper, which cuts down on all the time-consuming paperwork required to move units around the continent. Also, players can move in secret, adding an element of surprise not found in the board game. I recommend this primarily to beginners, or those who enjoy the game but want to avoid all the paperwork. For players ages 12 and up.

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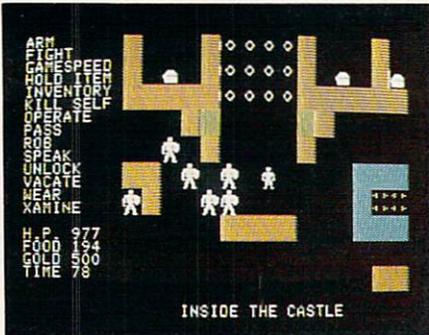
HARDWARE REQUIREMENTS: Apple II series, 48K (disk). Also for Atari Home Computers. Version planned for Commodore. Joystick.

MANUFACTURER: Strategic Simulations, Inc.

PRICE: \$49.95

It came as a surprise to find SSI's first fantasy role-playing game, *Questron*, such a disappointment. Its major fault lies in its similarity to the deservedly best-selling *Ultima* series. (See the review of *Ultima III* in the September FAMILY COMPUTING.)

You begin by naming a character the computer has created. All new characters have exactly the same strengths at the game's start. (This immediately cuts down on the fun of being able to assign different strengths to different characters, a feature found in most other similar role-playing games.) Your character is then put into a fantasy world in which he or she must voyage, gaining experience, fighting monsters,



acquiring ever more sophisticated weapons, armor, and magic spells, in a quest for the villainous sorcerer and the source of his power.

There are few real differences between this and the *Ultima* series, designed by Lord British. Thanks to the musket included in your armament, you are all but invincible in combat. Also, several new modes of transport are included, such as a great eagle who can fly over land, sea, mountains, and swamps. And gambling dens dot the landscape. These are places of respite in which you may try to increase your cash on hand and take a break from battle.

Questron isn't a bad game. It's just that we've seen it done better



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SOFTWARE REVIEWS

before. If you haven't tried the *Wizardry*, *Ultima*, and *Apschai* series, and your local shop doesn't carry them, then certainly, *Questron* will do. Those who've mastered these series probably would be better off waiting for *Wizardry IV*, *Ultima IV*, or *Apschai VI*.

Rails West!

HARDWARE REQUIREMENTS: Apple II series, 48K (disk). Also for Atari Home Computers.

MANUFACTURER: Strategic Simulations, Inc.

PRICE: \$39.95

	\$	%I	\$/%	%ch
Revenue	15,120	100	420	5+
COG Sold	7,305	49	205	8+
Overhead	2,221	15	62	22+
Adver. & Mkt	280	1	14	0
Reser. & Devlp	380	2	25	12+
Depreciation	380	2	25	14+
Misc Expense	0	0	0	0
Oper Expens	4,321	29	120	17+
Interest	225	1	6	14+
Taxes	1,517	10	42	11+
Total Costs	13,448	89	374	4+
Net Income	1,672	11	46	12+

An exciting simulation of the construction of the American railway system at the end of the 19th century, this may be one of the toughest games you'll encounter. It requires the ability to strategically plan out a transcontinental rail network, and conduct stock, bond, and loan transactions over the short and long term.

Players begin the game with an equal amount of money. Then, through careful investments, and/or the acquisition of one or more railways, they build financial empires. Fluctuations in the country's economy affect stock and bond markets, and consequently, players' holdings. Properly handled, you can use these situations to build up your company. Wrong decisions, on the other hand, can be ruinous.

You'll have fun even if you get wiped out, however, for bankrupt players automatically start over when they're obliterated. Opportunities exist for financiers to build or wreck railroads, force a stock up or make it crash, and even merge with others players (human or computerized), with you in control.

Playtesters over 12 were thoroughly absorbed in this game from the start, though it took several turns before anyone had much idea about what they were doing. At the outset you can select a number of different play settings. You're given four dif-

ferent levels of difficulty and the option to play with up to seven other people or four computerized opponents. You may compete under historically accurate circumstances, with the economy booming and collapsing as it did in the late 19th century. Or you can choose to play with an unpredictable economy.

Rails West!'s graphics aren't much, just some charts and maps that don't really enhance the game. But the game's excellent play system more than makes up for its standard visuals—one of the year's best.

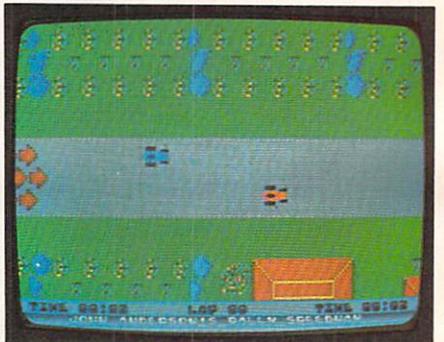
Rally Speedway

HARDWARE REQUIREMENTS: Atari Home Computers, 16K (cartridge). Joystick.

MANUFACTURER: Adventure International

PRICE: \$49.95

There's a lot of action packed into this plastic cartridge. Players steer race cars around one of two tracks, learning how to control their vehicles under icy, wet road conditions, contending with horses and trees, and maneuvering at a number of different speed settings.



When those two tracks begin to bore you (and they will, once you've mastered them), the real fun begins. *Rally Speedway* gamers can design and "build" their own race courses, using components—hairpins, crossroads, orchards, trees, houses, etc.—furnished on the cartridge.

This do-it-yourself element is the game's chief selling point, for the possibilities for different race courses are virtually endless. Save them to disk or cassette, or map out your creations on graph paper. Playtesters 10 and up worked for hours designing their own track layouts, then testing each other's courses. The game makes for excellent family entertainment, with each member able to construct tracks and challenging others.

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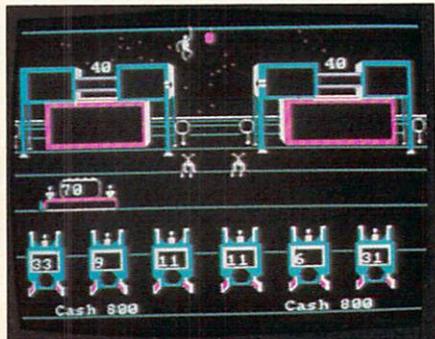
Run for the Money

HARDWARE REQUIREMENTS: Reviewed on IBM PC, 64K (disk). Also for IBM PCjr; Apple II series; Atari Home Computers. Joystick.

MANUFACTURER: Scarborough Systems, Inc.

PRICE: \$39.95

This game recreates the trials and tribulations of two "bizlings"—interstellar businesspeople marooned on a planet inhabited by intelligent monkeys. One or two players adopt



the bizlings and use joysticks to help repair their spacecrafts and blast off for other planets. The first player to successfully launch his or her bizling's spaceship wins the game.

Not so easy, though. Repairs require cash, which you must raise by setting up a small manufacturing business. You begin with a limited amount of money to spend on "rufs," the raw material found on the planet. Bring the rufs back to your ship and turn them into "synanas," synthetic bananas which you can then advertise and sell to the simian populace for money. Through careful planning, you'll have enough cash to spend on your ship's repair, with extra left over for more rufs.

Sound complex? There's even more to the game, but the documentation and clever, built-in tutorial make it painless and relatively easy to master. The game is fast-moving and involves a good deal of quick-thinking joystick action to move goods and bizlings and bid against the competition.

Playtesters 16 and up found *Run for the Money's* challenges very absorbing, and enjoyed the sense of humor unusual in financial simulation games. Younger players, ages 10 to 15, took a bit longer to grasp concepts of supply and demand, cash-flow, and advertising. But once they got the hang of it all, they were hooked, too.

—REVIEWS BY JAMES DELSON

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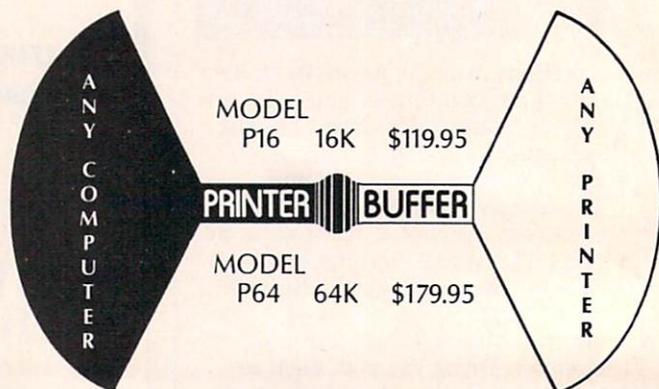
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THE PRIMER

The Primer is a regular department of FAMILY COMPUTING, though the information presented changes from time to time. It is a handy reference guide that briefly explains the basic words and concepts you'll encounter when using a computer.

The only way to learn to use a computer is to use one. But before you start, it's well worth asking, "What can I do with a computer?" And, "How does a computer work?"

The illustration of a computer system on the following page shows various pieces of equipment, referred to as hardware. To work effectively, this hardware needs step-by-step instructions, or programs. These programs are often called software. What you can do with a computer depends on the software you use.

The many uses of home computers can be broken down into several broad categories.

WHAT A COMPUTER DOES

Game Playing. Several types of games are available—arcade-style action, fantasy, adventure. Some take minutes to master; others months. Many games can be played by more

than one person at a time.

Education. Whether you are learning math, French, history, or typing, these programs allow you to learn at your own pace. Programs range from question-and-answer drills to loose creative exercises. Some test logical skills by putting you in a real-life problem-solving situation; others teach you to program by letting you draw pictures.

Paperwork. When it comes to handling reams of information, the computer can't be beat. It functions as an endless supply of paper, file cabinets, and a calculator rolled into one. With an electronic spreadsheet, you can change one figure in a budget and the rest will automatically change. The ability to ask "What if?" and see immediate results has obvious time-saving benefits.

The computer is equally adept at setting up a filing system, and al-

lows you to cross-reference data in any number of ways for easy recall.

With a word-processing program, the computer can speed up and simplify the writing process, by allowing you to change or rearrange words and paragraphs without retyping.

Communications. You can connect your computer, via the telephone, to much larger computers at "information service" companies. When connected (for an hourly usage fee), you can "call up" stock quotations, airline schedules, newspaper or magazine bibliographies, and get the latest news relating to your particular computer. You can also leave or receive messages for other subscribers, a practice called "electronic mail."

In addition, you can connect your computer to individual computers around the country. You can chat with friends, exchange programs, or

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THE PRIMER

call up local "bulletin boards." They are considerably smaller than information services, usually run out of someone's house, and specialize in one topic only.

Programming. It's possible to enjoy practical benefits from your computer without ever buying a commercial program—you can write your own. And, in some cases, you can adapt commercial programs to better suit your practical needs.

HOW A COMPUTER WORKS

The computer is an information-handling machine. It stores, compares, changes, and manipulates information of almost any kind at tremendously high speeds.

The computer's operating method can be boiled down to four simple steps. (1) **INPUT:** Instructions and information, in the form of a program and data, are entered into the computer. (2) **PROCESSING:** The computer executes the steps of the program. (3) **OUTPUT:** The results of the computer's work are made visible and available to the user. (4) **STORAGE:** Results can be stored and saved.

Most home computers do not come ready-made in one piece, but must be assembled from various

components. Following are the components needed for each of the four operating steps, and how they work.

Input. There are four basic ways of getting a program and/or other information into a home computer.

KEYBOARD. The keyboard looks and behaves much like that of a typewriter. Some keyboards have special keys for certain computer functions, and some have a numeric keypad, much like a calculator. But on any unit, every keystroke you type goes directly into the computer's memory. That information will stay there until you delete it or turn the computer off. (You can also store, or save, that information for future use.)

CASSETTE TAPE RECORDER. You can copy a program stored on a cassette tape directly into the computer's memory. Regular tape recorders and cassettes can be used with most home computers, although you will need a special cable to connect the two. Once connected, you merely type a simple command to transfer the program from tape to computer.

DISK DRIVE. The transfer method is much the same with a disk drive, except that the program is stored on a floppy disk, which looks much like a 45 rpm record.

The disk drive enters programs much more quickly and with less chance of error than the cassette recorder. But the cassette recorder is significantly cheaper.

CARTRIDGE. A cartridge, which plugs into a slot built into some computers, also stores programs. Putting a cartridge into a computer actually adds memory to the computer—and that memory contains a program.

Processing. All input goes to the Central Processing Unit (CPU). The CPU, a tiny maze of electronic circuits, is most often located underneath the keyboard. However, in some computers it's contained in a separate system unit.

The CPU controls the flow of information into, out of, and inside the computer. The computer's memory, where information is stored, is located in the CPU. The CPU also interprets a program, performs each of its steps, and then sends the results to the user.

Output. The visible result of a CPU's work is called output. Output is made available on the screen of a TV or monitor, or from a printer.

See the accompanying illustration to find out how these components

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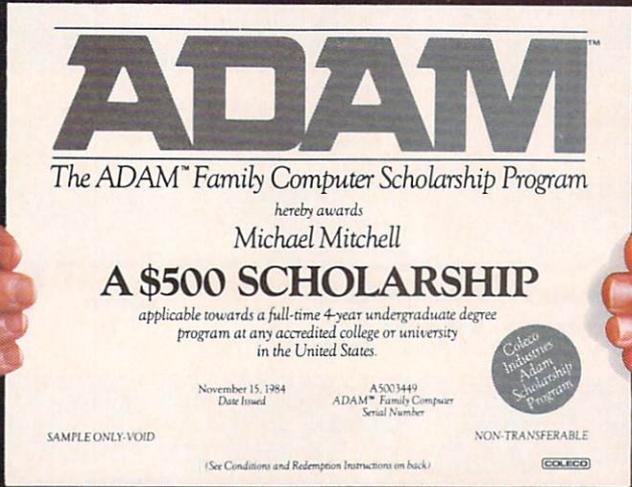
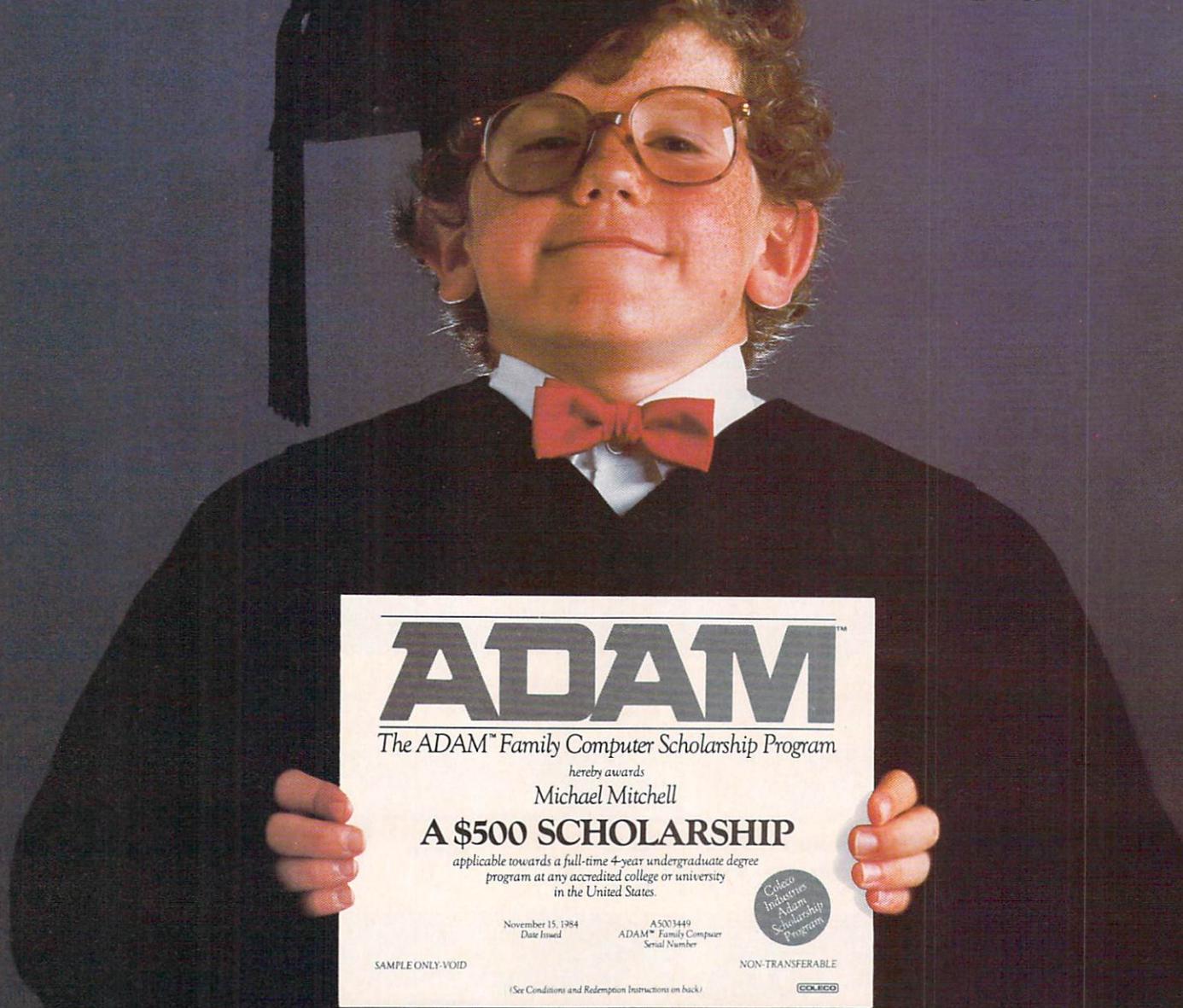
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are connected to the computer.

Storage. When the computer is turned on, it will store and remember all information it receives. But when it is turned off, this information will vanish—unless you instruct the computer to save it.

You can store information on a blank tape or disk. Either way, you can record the results of the computer's work, just as you would record a speech. Then, any time you want to run that program again, you

can transfer it into the computer's memory, and see it on the display screen.

You cannot store new information on a cartridge.

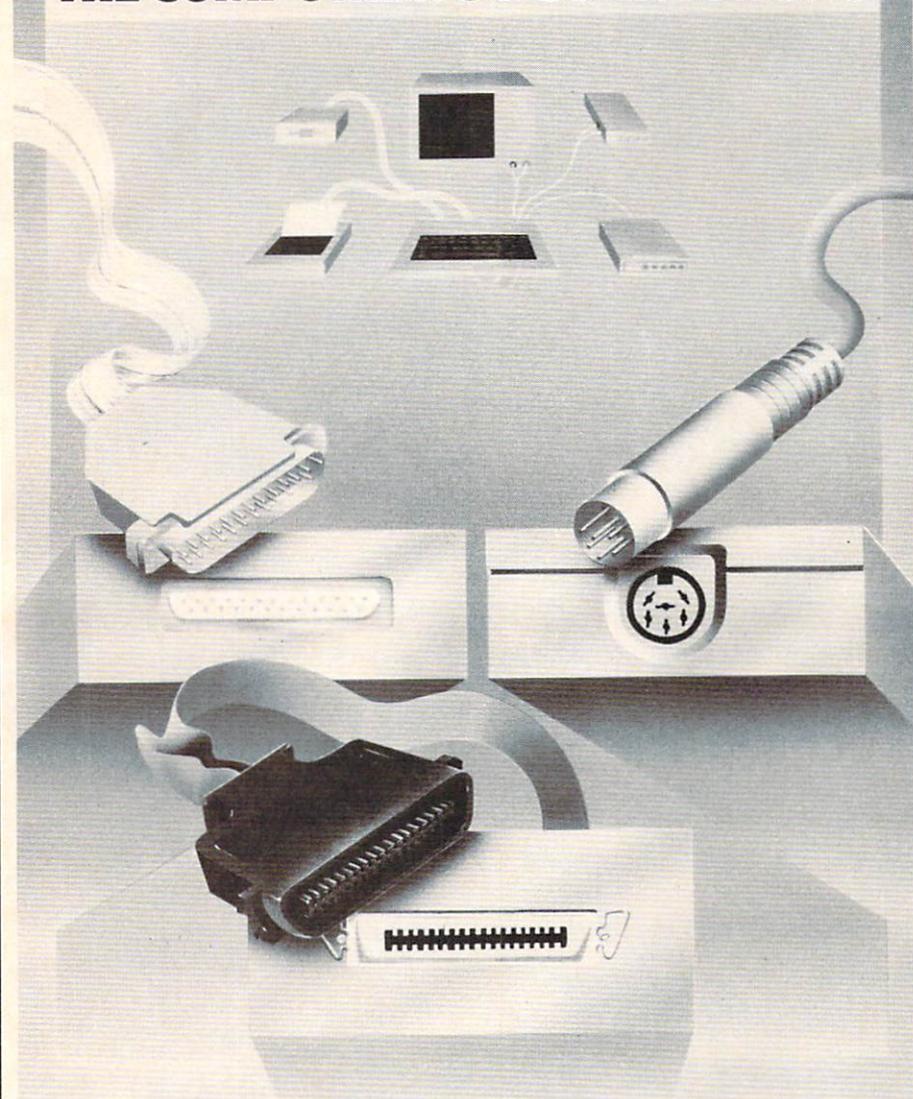
Peripherals. Peripherals are optional pieces of equipment that can be added to your computer, but are not crucial to the computer's operation. A printer, in fact, is considered a peripheral. One of the most popular peripherals is a modem.

MODEM. If you want to link your

computer to an information service or to another computer by phone, you will need a modem. A modem either holds a telephone receiver or a modular telephone jack, and can send and receive data through the phone lines.

Remember that the computer is a tool. As with all tools and machines, there is no need to know everything about how a computer works. All you need to know is how to use it for your own purposes.

THE COMPONENTS & CONNECTIONS



A. Disk Drive. Disk drives sold for a particular computer brand generally come with the proper connecting cable.

B. Monitor/TV. Often a round DIN connector hooks into the computer; a cable with audio/video jacks hooks into the monitor. Sometimes

a simple video cable, with one jack at each end, is used (no sound output). To connect a TV to a computer, you'll need an RF modulator, which is standard equipment with most computers.

C. Cassette. The interface is often a cable with two jacks (or three)

at each end: one for saving a program to tape, and one for loading a program into the computer. Sometimes the computer end of the cable is a round DIN connector. And, for Atari and Commodore, the cassette end of the cable is hard-wired into the cassette player.

D. Printer. The most common printer connection is the Centronics-type parallel interface, though RS-232C interfaces are usually an option. Apple's Macintosh uses a high-speed serial port. Atari and Commodore computers require special cables. Apple II and IBM PC require internal circuit boards. IBM PCjr requires a parallel printer attachment.

E. Computer. A computer's ports, where cables are connected, can be on the back, side, front, or even the bottom of the unit. Note: sometimes the keyboard unit is separate from the Central Processing Unit (CPU), or system unit.

F. Modem. Most external modems are connected with an RS-232C serial cable. Slight wiring modifications are sometimes required. Internal modems, available for Apple and IBM, are circuit boards that go into slots inside the computer; no connecting device is necessary.

G. DB Connector. Used to connect printers, modems, and even joysticks, the DB connector has between nine and 25 pins. The classic RS-232C serial interface, shown here, has 25 pins, with each pin leading to a wire inside the cable.

H. Round DIN Connector. Round DIN connectors plug into the computer's serial port (for modems and printers), or they are used as one end of a monitor cable. One-, five-, six-, and eight-pin configurations are used.

I. Centronics Parallel Interface. The most common parallel interface is the Centronics connector, which is used to connect printers. The 36 "pins" do not protrude, but lie flat against a plastic center ridge.



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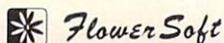
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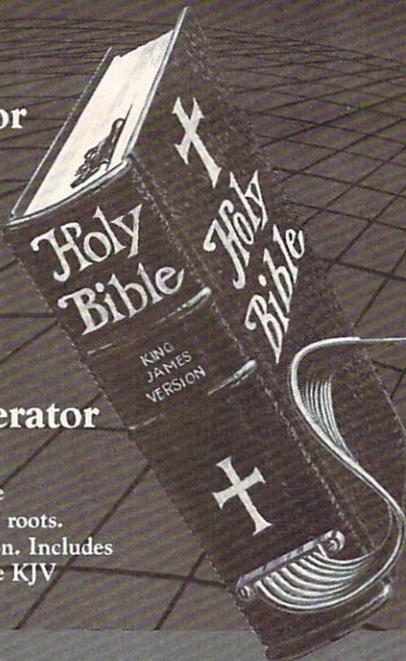
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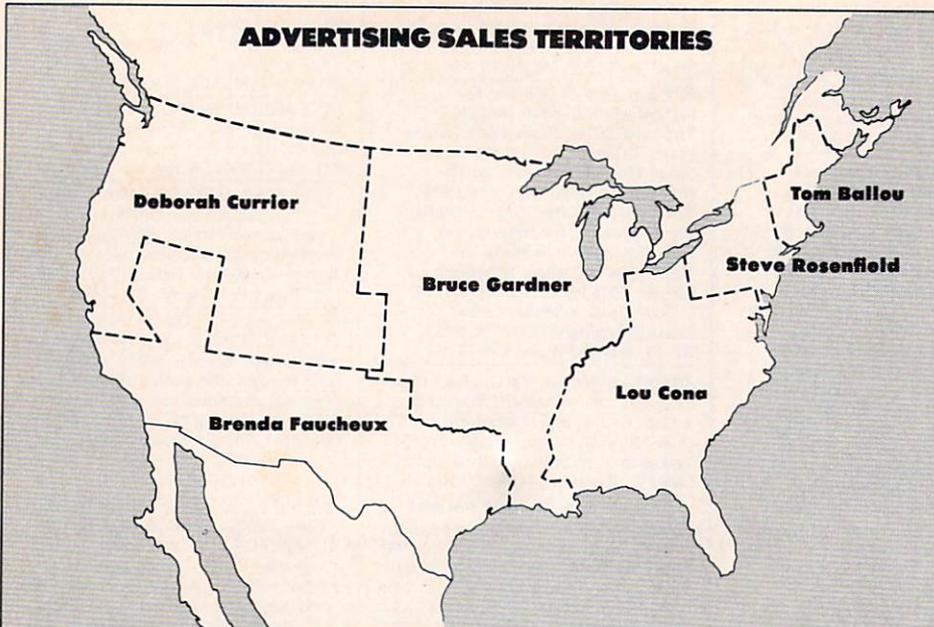
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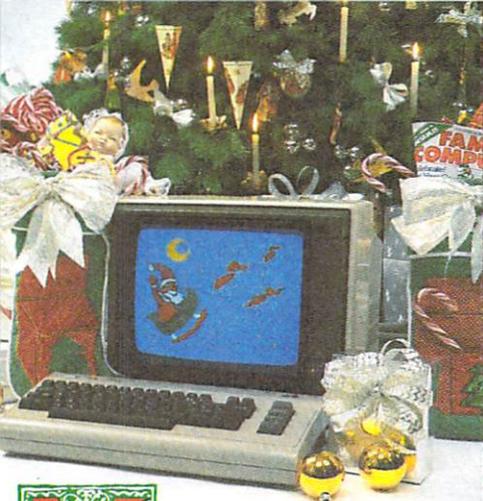
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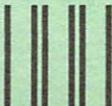
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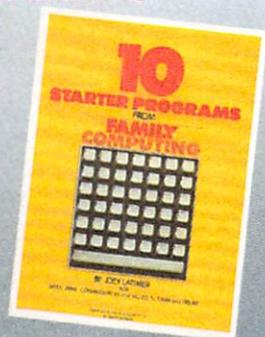


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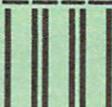
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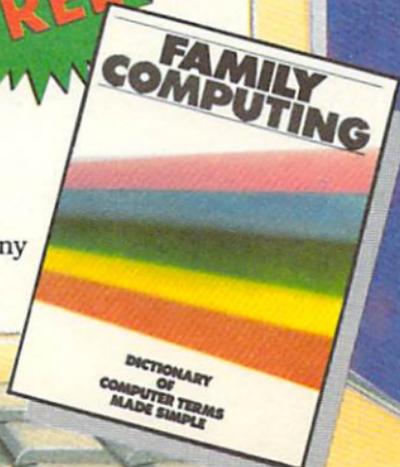
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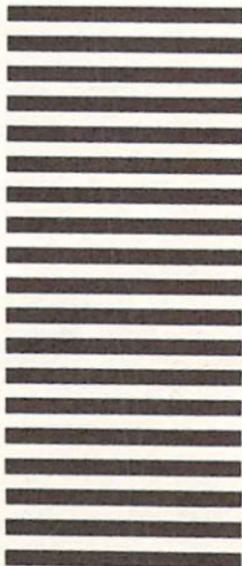
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- g. Apple IIc
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 j. Commodore 64
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 c. 3-4
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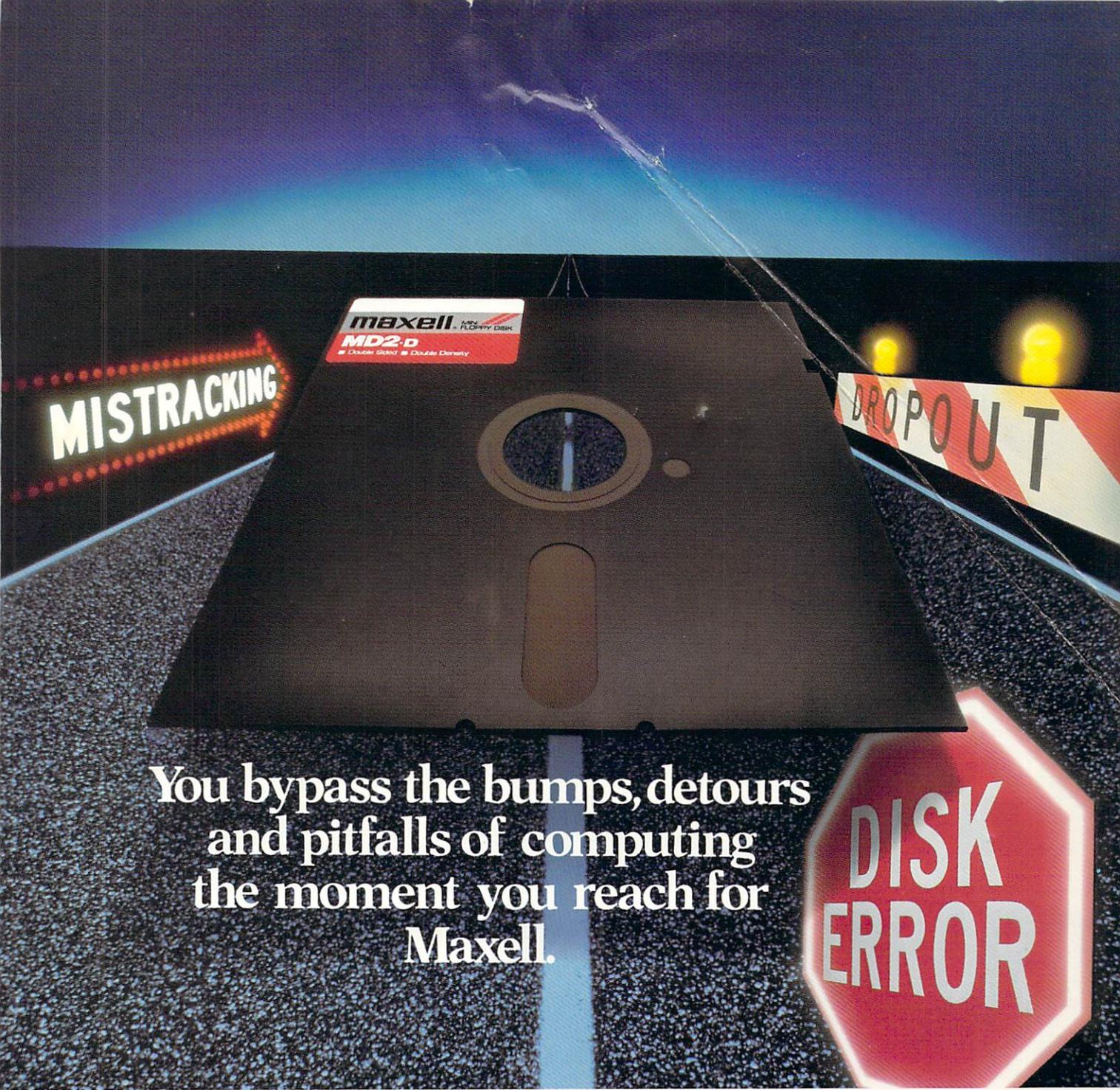
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