

2nd ANNUAL
Shopping Guide
FOR COMPUTER LOVERS

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COMING IN JANUARY:
1986 Computing Family of the Year Contest Announcement. Watch for rules and prizes.

COVER PHOTOGRAPH BY RICK BARRICK



EDITOR'S NOTE

A DIFFERENT KIND OF HOLIDAY LETTER

When I write my editor's note each month, I know I'm likely to cut the first two paragraphs. This month was different—I cut the whole thing. This is actually the second complete letter I've written.

Originally, I thought I'd give you some shopping tips to go along with this special shopping guide issue, but most of you know all the standard tips by now: Start with needs, then software, then the computer and price. Be prepared, try it out if you can with the help of a neighbor or friend, and, of course, read FAMILY COMPUTING. Be thorough. Find out about all the parts and cables you'll need and don't forget to ask about complete costs—you're talking "system." System also means compatibility. Will the printer work with the computer? And how about with your word-processing software? You know. So that was out.

Sweet was out too. This is a tough year for the computer business, and a lot of people have lost sight of all us devotees out there. So I thought I'd talk a little about that—tell you who else owns computers and what they're like. A different sort of holiday letter.

The reason I've got all this information at my fingertips is that we've just finished compiling the results of a recent reader survey. Here's the scoop on FAMILY COMPUTING readers:

Circulation numbers: Big.

Circulation now stands at just over 400,000—that's a 100 percent increase in the past two years. Taking family members into account, that's more than 1,600,000 readers!

Ownership: High.

83 percent of you own at least one computer, 56 percent use one at work, and 23 percent own more than one computer! The people who "get it" want more.

Peripherals: Increasing.

64 percent printer ownership, up from 44 percent, and that's just one of several double-digit growth areas. Others are monitors, at 62 percent;

disk drives at 68 percent; and modems, at 17 percent. Use is getting ever broader.

Software use: Extensive.

Ownership of entertainment software heads the list, at 61 percent. Word processing is close behind, at 58 percent; and following are education, at 47 percent, data base/filing, at 39 percent, spreadsheet, at 38 percent, and personal finance, at 35 percent. Plans to buy are also big, with education heading the list at 53 percent.

Who's buying computers and what are they like?

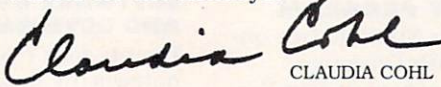
Sex: Men—62 percent; women—38 percent. Marital status: 67 percent are married. Family: 56 percent are parents, 65 percent have children in the household. Education: 69 percent attended/graduated from college. Income: 56 percent have a household income of more than \$35,000. Median age: 37.6 years. Average household income: \$41,856.

There's more, of course, about buying habits and lifestyles, for example, but these are the basics. You get the picture. Computer-owning families are way above average.

However, 55 percent felt the need for more education and a better understanding of the products they own. That's one way that we come in—by helping you be more successful with your computer. And this special issue is in large part devoted to giving you information you need to make the right buying decisions.

But of course we don't want to ignore the holidays. In fact, this is an issue filled with special treats. Don't miss our music programs and be sure to explore our *Christmas Tree Construction Set* program (page 66).

Above all, our entire editorial staff wants to make sure we don't miss this chance to send you our best wishes for the holidays!


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CIRCLE READER SERVICE 49

[SEE PREVIOUS PAGE]

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CIRCLE READER SERVICE 49

LETTERS

BRINGING THE FAMILY TOGETHER WITH COMPUTERS

Your magazine has proved to be the door to the world of computing for me personally and my family. Neither my parents nor my sister (10 years old) were ever interested in computers until I optimistically introduced FAMILY COMPUTING to them. It was the September 1985 issue, which contained the article, "A Parent's Guide To Learning At Home With Computers."

The magazine magically and instantaneously fascinated the family, especially my father. It actually drove him to buy the highly praised IBM PC. The "Tips," "Glossary," and "Primer" (all included in the article) helped tremendously in our ever-growing knowledge of computers. Coincidentally, an additional article in the same issue (wow!), the "Buyer's Guide to Low-Cost Printers," helped the family decide to buy a printer that fit our budget.

After reading the article myself and also letting my family read it individually, we discussed it, and that brought my family together. For that, and all else, I thank you. Your magazine is easy for beginners and also challenging for experts. It was easy for me and my family because you are truly a family magazine. My family, thanks to you and your magazine, is now a computing family.

ANDY SZUL JR., 15, and family
Philadelphia, Pennsylvania

APPLICATIONS FOR BUSINESS

My family and I are recent subscribers, and I would like to compliment you on a fine, family-oriented computer magazine. I have just recently acquired a home computer, a Commodore 64.

I thoroughly enjoy FAMILY COMPUTING and will continue to read it, although I am currently investigating specific business applications which are beyond the FAMILY concept. But my family will continue to explore FAMILY COMPUTING.

ANDREW L. STRUTHERS
Lincoln, Nebraska

EDITOR'S NOTE: Responding to increased requests from our readers, we've expanded our business—and, in particular, our home business—coverage. Take a look at the October cover story, "Buyer's Guide to Business Computer Systems," and, in September, "Computerizing Your

Small Business." We regularly publish tips and reviews of business software in our Working at Home department. And don't miss the upcoming February issue for a unique approach to using your computer at home to help out in the office. To obtain previous business articles, you can order back copies of FAMILY COMPUTING for \$3.95. Make checks or money orders payable to FAMILY COMPUTING and allow six to eight weeks for delivery. Send orders to: FAMILY COMPUTING, Back Issues, P.O. Box 717, New York, N.Y. 10276-0717.

THANKS FOR THE MENTION

I can't tell you how pleased I am to find the ADAM computer mentioned in your August issue ("Support for ADAM" in Behind The Screens, page 8). I purchased an evidently defective unit, but I was so pleased with the word-processing part that I didn't want to return it. I called the Coleco number at least 30 times and it was always busy. After seeing your article, I decided to try again, and—lo and behold—they answered.

I detailed the problem I was having, and they referred me to a local Honeywell Service Center. They replaced a defective data drive overnight at no charge. I was pleased to find that they stock most of the hardware and some software for the the ADAM. The unit is now working perfectly. I have enclosed my subscription order; many thanks.

JACK AMORY
Virginia Beach, Virginia

THUMBS UP TO 'HANDS ON' AND K-POWER

In the October '85 issue is part one of a six-part series called "Hands On." What a neat idea. My compliments to the people who decided to go with this series. I am just learning to use the computer. I try to read most of the major publications on computing. Most are way too deep for me. Your magazine helps to open the doors for me.

Although I am a grandparent, I go right to the K-POWER section. The articles are easy for me to understand. I find all the articles in your magazine interesting. Of all the magazines I read on computing, I find yours by far the best.

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The Perfect Accessories

The Color Computer 2 is easily expandable as your family's interests, skills and needs grow. You can add a 156K Disk Drive for only \$199.95 (26-3129, Reg. \$349.95), or give a new dimension to BASIC

programs with the Sound/Speech cartridge (26-3144). You can even create electronic music on your home stereo with the Orchestra 90 cartridge (26-3143). These instant-loading Program Paks are only \$79.95 each. And you can make computer games even more exciting with a pair of Deluxe Joysticks (26-3012, \$29.95 each).

Access Data By Phone

Take advantage of special holiday savings on our deluxe RS-232 Program Pak for only \$59.95 (26-2226, Reg. \$79.95). It lets you communicate with information services and other computers—just add the DCM-3 telephone modem

(26-1178, \$59.95). The DCM-3 plugs into any modular phone jack.

Add a Printer

Every computer buff needs a printer and the DMP 105 is an excellent choice for only \$199.95 (26-1276). It prints 80 characters per second and graphics, too.

Make this holiday season one of the best ever for everyone at home with a Color Computer 2 from Radio Shack. And don't forget to include accessories and software!

Radio Shack®
The Technology Store™

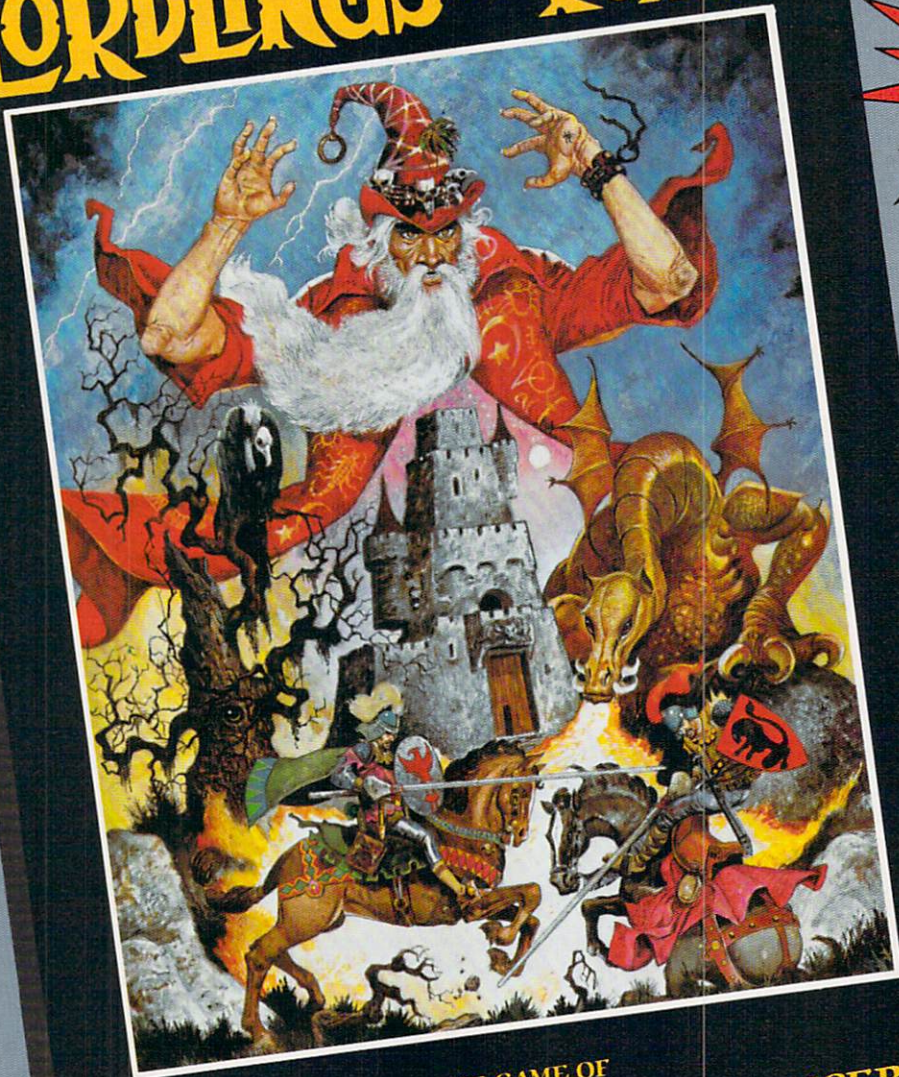
A DIVISION OF TANDY CORPORATION

Sale ends 12/24/85. Prices apply at Radio Shack Computer Centers and participating stores and dealers. TV, printer, disk drive, joysticks, modem, Program Paks sold separately.

CIRCLE READER SERVICE 40

IT'S HERE! THE ULTIMATE 'FANTEGY'™ COMPUTER GAME!

LORDLINGS OF YORE



\$39.95

(Dealer Inquiries
Invited)

*Fan-te-gy/'fan-te-jē/n:
A totally new game format
that combines the best
features of fantasy,
adventure and strategy
gaming in a world of
historical make-believe.

THE GAME OF
KNIGHTS, KNAVES & NECROMANCERS

Hi-res full-color graphics, sound, and animation are utilized in this unique new computer game to produce one of the most challenging player-vs-player or player-vs-computer concepts available anywhere. Realistic combat, hidden movement, limited knowledge of enemy

action and many other features make this game a "must" for those who seek a real test of their skill and ingenuity. Why wait? Order today and become a dedicated member of the LORDSLINGS OF YORE "round table".

CIRCLE READER SERVICE 47

Softlore Corporation

Available now for Apple series, IBM & C-64 versions coming soon. IBM, Apple & C-64 are registered trademarks of International Business Machines Corp., Apple Computers, Inc., and Commodore Business Machines, Inc., respectively.

40 NE Loop 410, Suite 615, San Antonio, TX 78216
(512) 691-2800

LETTERS

LOVE THE MUSIC

I'm a new subscriber to FAMILY COMPUTING. I'm also very new to computers. We purchased an IBM PCjr for Christmas. Are we correct in assuming any program written for the IBM PC also will run on the jr?

I'm writing about the music program *Take Me Out to the Ball Game* in your August issue. It is beautiful; however, when I run it, I get an illegal function call. I've tried to puzzle it out to no avail. We would love more music programs.

We enjoy your magazine very much—it is truly for all ages.

PATRICIA FRANK
Portland, Oregon

EDITOR'S NOTE: *If you have Cartridge BASIC for your computer, many IBM programs will indeed run on your jr. Take Me Out to the Ball Game is correct as published. It's a program filled with DATA statements, which are frequently difficult to type in correctly. For guidance on typing in programs and proofreading them, refer to "Tips to the Typist" in The Programmer. Whenever there are mistakes in our published programs or enhancements to enliven them further, we publish them in "Programming P.S.," also in The Programmer. We are glad you enjoy our music programs—check out Microtones and the Beginner Program in this issue.*

PRESCHOOLER HELP

I have been a subscriber to your magazine since its premier issue. My children, ages 14 and 16, have used it. We have an Apple II plus at home. I have now purchased a Commodore 64 for my classroom. I teach preschoolers, ages 2, 3, and 4. I appreciated your article on preschoolers (November 1983). I would like you to give us an update on this area. I am having a hard time finding appropriate software for this age.

My students really enjoy the graphics programs (*Santa Claus, Jack-O'-Lantern, Christmas Tree*, etc.). I hope you will continue to have more.

LYNN MACK
Lexington, North Carolina

EDITOR'S NOTE: *We, too, thought it was time for an update on preschoolers, so take a look at "Preschoolers, Parents, and Software" in last month's issue. For unique holiday graphics, check out Christmas Tree Construction Set in The Programmer.*

ON WITH THE AMIGA

I enjoy your programs each month. They give me something to do with my Atari. I planned on buying the new Amiga from Commodore. I would like to know if you are going to have programs for this computer. Could you do a review on this very nice computer? Keep up the good work.

WAYNE AARON
Scotts Hill, Tennessee

EDITOR'S NOTE: *The Amiga review you hoped for is already in our November issue! We will definitely publish programs for the Amiga as soon as there is a sizable installed base.*

SEEKING INFORMATION

Last Christmas I received a Commodore Plus/4 computer as a gift. I would like to know if I will see programs for my computer in your magazine. As a beginner in microcomputing, I am interested in programs that will help me to better understand my computer in daily use.

I really enjoy reading your magazine and hope to continue in the future. Is there any way for you to help me enjoy my Plus/4, too?

THERESA G. PETERSON
Hookerton, North Carolina

EDITOR'S NOTE: *We've always published programs and information for a variety of machines. Due to time and space considerations, we've had to limit the number and types of computer brands we cover. Our primary guideline has been to choose machines with a large base of home users. Unfortunately, the Commodore Plus/4 never really took off with U.S. consumers. We do, however, publish departments and features for all computer users, so we can be a valuable resource even to those who own machines we do not address directly. We'll be publishing specific information on how to adapt Commodore 64 BASIC programs to run on the Plus/4 in an upcoming issue. Don't miss it!*

FAMILY COMPUTING looks forward to letters from all our readers. Please direct your correspondence to: Letters to the Editor, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit letters for length and clarity. Due to the large volume of mail we receive, we are not able to respond personally to every letter.

SOFTLORE PRODUCTS ARE AVAILABLE AT THE FOLLOWING LOCATIONS:

| | |
|--|--|
| The Computer Room Flagstaff, AZ | The Computer People Bozeman, MT |
| Malibu Micro Agoura, CA | Triad Software Papillion, NE |
| Software Junction Orange, CA | Wargames West Albuquerque, NM |
| Balboa Game Co., Inc. Long Beach, CA | Modern Computer City Snyder, NY |
| Egghead Software Sherman Oaks, CA | Software City Syracuse, NY |
| Kinglord Games Sacramento, CA | Leigh's Computers New York, NY |
| S.D. Doss San Diego, CA | Duane Sales Schenectady, NY |
| Egghead Software Huntington Beach, CA | Software City Centerville, OH |
| Super Software Inc. Richmond, B.C. Canada | Fas-Track Columbus, OH |
| Softwarehouse West Inc. Edmonton, Alberta Canada | Northwest Hobbies Eugene, OR |
| Reserve Planetaire Diffusion Bievres, France | Computer Clinic Inc. Williamsport, PA |
| Tevox Inc. Narcross, GA | The Program Store Greensburg, PA |
| The Ware House Warner Robbins, GA | Computer Concepts Beaumont, TX |
| Data 1 Honolulu, HI | San Antonio Discount Computer Supply San Antonio, TX |
| Software Galeria Idaho Falls, ID | The Software Store San Antonio, TX |
| Data Domain Schaumburg, IL | The Program Place Dallas, TX |
| Illini Microcomputers, Inc. Naperville, IL | Concept Computer Center Beaumont, TX |
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| Hobby Game Distributors, Inc. Lincolnwood, IL | Computer Solutions San Antonio, TX |
| Hobby Shop Zion, IL | Software Galeria San Antonio, TX |
| Star Craft Inc. Toshima-ku, Tokyo JAPAN | Book Stop San Antonio, TX |
| ComputerArk Lawrence, KS | San Antonio Discount Comp. Supply San Antonio, TX |
| Instant Software Acton, MA | Softgame Services Carrollton, TX |
| The Logical Choice Baltimore, MD | Central Park Office Supply San Antonio, TX |
| Advantage Business Store Lewiston, ME | Software City Richmond, VA |
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| Alcove Hobbies Royal Oak, MI | Colortron Computers Racine, WI |
| Software City Creve Coeur, MO | Computer Software Ctr. Milwaukee, WI |
| The St. Louis Software Center St. Louis, MO | The Computer Solution Casper, WY |

Softlore Corporation

CIRCLE READER SERVICE 47

HOME-SCHOOL CONNECTION

COLLEGE-SELECTION SOFTWARE BRINGS THE GUIDANCE COUNSELOR HOME

BY LARRY KRENGEL

Williamsfield High School had a graduating class of 25 last year. It was too small to afford the main-frame prices and computer systems that have, until now, been needed for a college information data base.

But the "times they are a-changin'." True microcomputer software for home use is now available for the high schooler with college in mind. In fact, as the number of programs multiplies, it becomes increasingly difficult to know which is right for your particular interests and needs. Added to all the other questions: "Which college should I attend?" "How do I get into the university I want?" and "How much will it cost?" is now the question, "Which college-selection software is best for me?"

Joe Pasternock, coordinator of guidance at York Community High School in Elmhurst, Illinois, sees college selection software as very useful, but only if approached with proper guidance. He points out that high schoolers don't always understand the ramifications of their decisions when responding to the questions in the programs. A 17-year-old might need help in judging how much independence he or she really wants in college, or what the effect of a very large class size might be. Without this understanding, Pasternock says, college selection software is of little use.

The computer, combined with the right software, provides parents and kids the wherewithal to search

through many types of colleges and discuss choices together. It enables parents to become involved and offer guidance while viewing specific criteria on-screen. The option presented by the computer to compare colleges that fit all the right general criteria encourages you to refine your requirements, and better understand the choices you ultimately make as a family—prospective college student and parents.

MANY CRITERIA, MANY CHOICES

There are two programs with data bases that contain over 1300 accredited four-year colleges and universities. One is put out by Peterson's Guides—the company long known for its college guide books. The *College Selection Service* (\$145) is based on the Peterson publication, and, in fact, even carries cross-references to it.

The *College Selection Service* leads you, via the process of elimination, to the names of colleges that fit your personal requirements. There are 20 categories of selection criteria. As you make your choices, you see an ever shrinking total on-screen of colleges that fit the bill.

The criteria include such questions as locale, public vs. private universities, and cost. There is a very complete list of intercollegiate sports (including scholarship availability). Thirty-one sports are included! The user can also find out admissions requirements (e.g. number of years of science or languages necessary for acceptance), whether there are special academic pro-

grams, and what rating Peterson gives for entrance difficulty.

After specifying: IDAHO, PUBLIC, NON-COMPETITIVE, with SCHOLARSHIPS IN MEN'S ATHLETICS, for example, the program tells you there are two schools on your list. Pressing "L" gives you the universities' names and addresses. If you get stuck, an "H" brings up a well-written help screen. In the middle of the exercise, if you want to see what you have done thus far, "S" gets you a summary.

This program is now being used at Williamsfield High School. Philip Doubet, the assistant principal, encourages students to investigate college offerings on the school's Apple and to choose the best one for their needs.

Peterson's program can be accessed on CompuServe or Dow Jones News Retrieval. There is no extra charge. The only expense is contact time.

One of the most user-friendly programs I have seen comes from Jefferson Software—*College Directions* (\$99). It has a data base of 1300 colleges and conducts the search in 19 well-defined steps with criteria similar to Peterson's. In the "selection" part of the program, the user narrows down his or her criteria, which are then compared to profiles for colleges in the data base.

Want to know more about the colleges with which you were paired? You can receive a detailed description of any of the colleges: precise size of student body, for example, or specifications on housing, or whether facilities are accessible to stu-

LARRY KRENGEL lives in Illinois. He is a regular FAMILY COMPUTING software reviewer.

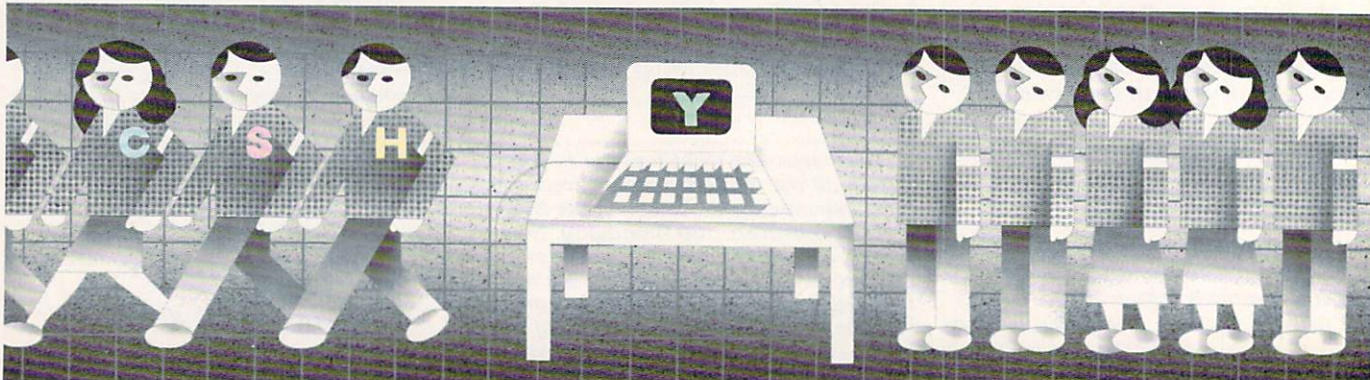


ILLUSTRATION BY JIRO MATSURI

Go ahead, accuse us of sensationalism.

Over the next four pages, we're going to bare our specs and divulge all the nitty gritty details about the latest developments to come out of Apple Computer.

Starting with our new Apple® ColorMonitor Iie and ColorMonitor Iic.

In all modesty, we think these are the best color monitors you can buy at any price for your Apple II, II+, Iie or Iic personal computer.

Both have composite color, 13-inch screens that let you produce a dazzling array of multi-hued graphics. Without going to the expense of adding an RGB interface card or external adaptor.

Simply plug the monitor directly into the video output jack on the back

Here's the inside story on all the colorful things that have happened at Apple.

of your Apple, and you're ready to start computing in living color.

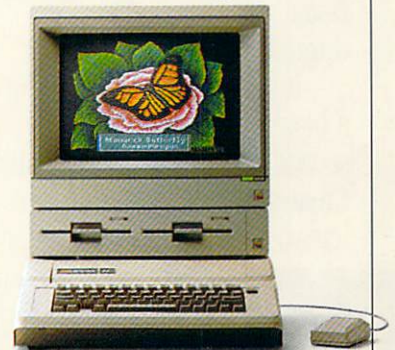
Which is terrific for games and graphics oriented programs like Apple Logo II, Instant Pascal™ and Dazzle Draw.

But not quite so terrific for text programs. As anyone who's ever gone blurry-eyed from trying to read words on a color CRT will readily attest.

Not to worry.

We've designed both ColorMonitors to automatically go from color to a high resolution, 80-column monochromatic mode anytime you use text software.

As you can see, we've also styled each ColorMonitor to fit in with our family looks. The ColorMonitor Iic is pure white, and has an optional rigid stand. While the ColorMonitor Iie is designed to rest



The ColorMonitor Iie on a Iie.



The ColorMonitor Iic on a Iic.

on top of your Apple Iie, and comes in our favorite shade of beige.

And thanks to some particularly bright Apple engineers, our ColorMonitors are compatible with virtually all existing Apple II software.

Well, there you have it. The scoop on one of the most colorful events in Apple history. But as you might expect, it's certainly not the whole story.

If you turn the page, you'll see that the saga continues.



The truth about our new color printer in black and white.

In case you haven't heard, Apple has a whole new cast of characters.

Our ImageWriter™ II printer.

Like its predecessor, the original Apple ImageWriter, our ImageWriter II is one of the most dependable dot matrix printers very little money can buy. And it's compatible with every Apple personal computer.

But that's where the similarities end.

The ImageWriter II prints faster and clearer than the original ImageWriter.

It cruises through drafts at a blazing 250 characters per second. Produces sharp graphics. Creates near letter-quality text. And lets you print in six vivid colors.

Simply change the black ribbon to the continuous cloth, multi-color ribbon, and you're ready to churn out reams of yellow, red, blue, orange, green and purple output.

You can print pictures and greeting cards with software like Stickybear Printer. Design your own



color drawings with Blazing Paddles and Dazzle Draw. And whip out color business graphics using SuperCalc 3A, pfs: GRAPH or Mouse Calc.

As you would expect, you can vary the pitch and spacing on the ImageWriter II. And print in standard or half height.

But as you would probably never expect, the ImageWriter II is also expandable.

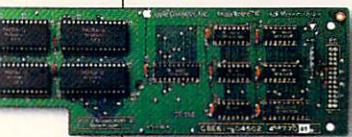
By adding the ImageWriter II 32K Memory Option print buffer, you can continue to compute

while the printer continues to print.

Attach the ImageWriter II SheetFeeder, and you can automatically load single sheets of paper into the printer.

And by having your authorized Apple dealer install our AppleTalk™ Option, the ImageWriter II can even be shared by several different Macintosh™ workstations.

Which means, for businesses, it can vastly improve the looks of one very important piece of paper: Your budget sheet.



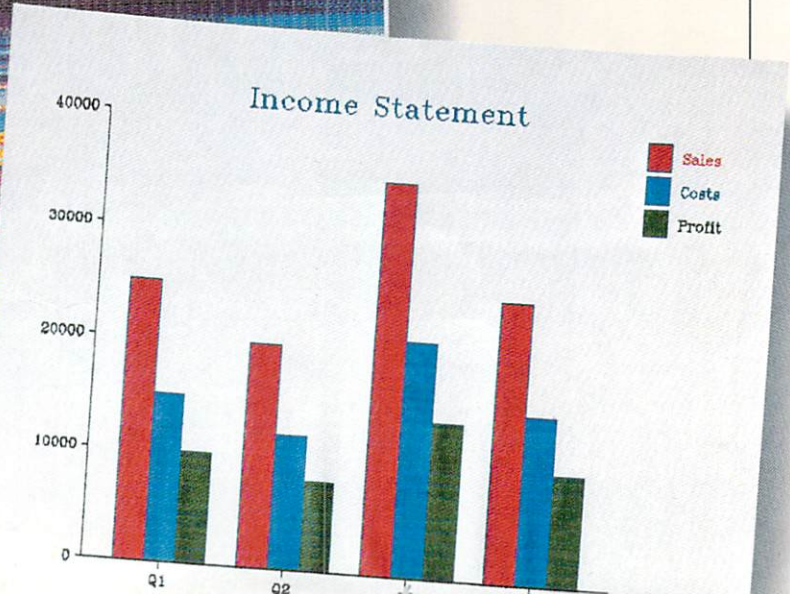
ImageWriter II
32K Memory Option.

Simply change the black ribbon to the continuous cloth, multi-color ribbon, and you're ready to churn out reams of yellow, red, blue, orange, green and purple output.



BOOK REPORT
The purpose of framing is to make the art itself. All good reasons framing methods available, so he the pros and cons materials and cost favorite artwork

Do-it-yourself
If the piece has sentimental value, professional framing will often cost the factor, but you can save by doing it yourself. You'll need all the tools, advice, and cost of custom hour to put together hours, while unless you pay craftsmanship framer will of also frame you

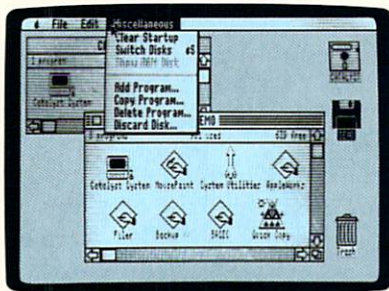


Stop flipping between floppies.

We call it the "floppy disk shuffle."

Having to boot and re-boot floppy disks every time you want to go from one application to another.

Well, the end of your shuffling is in sight.



Catalyst 3.0 with desktop icons.

Quark, Inc., will soon be shipping a unique new program called Catalyst™ 3.0 that's designed to be used with Apple II computers equipped with mass storage.

Catalyst 3.0 lets you install multiple programs on a single storage device. Macintosh-type desktop icons show you what's loaded on the program. To select the item you want, simply use an optional mouse or keyboard to open the file.

Look for Catalyst 3.0 to show up on dealer shelves soon.

Then you'll finally be able to boot all those floppies for good.

A plug for our new modem.

With the introduction of our new Apple Personal Modem, we've solved one of the biggest problems known to modems:

Where to hide them.

The Apple Personal Modem plugs directly into a standard A/C wall outlet. So unless your computer room is decorated with paisley wallpaper, it'll blend right into the

immediate surroundings.

Of course, aesthetics aside, it's also one darn good modem.

The Apple Personal Modem offers 300/1200 baud operation. Has the latest VLSI technology. Features automatic dial, re-dial and answer capabilities. Uses the industry standard Hayes AT Command Set. Plus it's totally compatible with current Apple communications software.

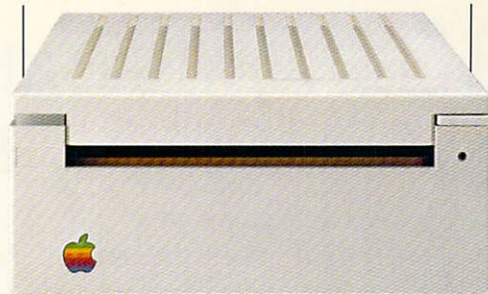
And even though we designed the Apple Personal Modem to be out of sight, there's one part of it that's definitely not:

The price.

We've increased our drive.

Our capacity for work just got bigger.

The new Apple UniDisk™ 3.5 external drive uses 3½" dual-sided microdisks to add a humongous



800 kilobyte capacity to your Apple II, II+, IIe or IIc. Which is more than five times the amount of storage available from a standard 5¼" drive.

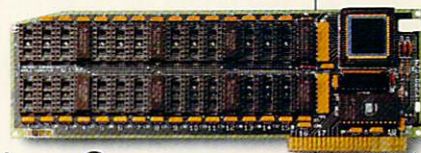
The UniDisk 3.5 is also faster than 5¼" drives. So you'll spend less time listening to that all-too-familiar whirring sound.

You can even "daisy chain" a second UniDisk 3.5 off the first one. In case you're planning to write the next great American epic or something.

As you may not know, disk drives are the most vulnerable components of any computer system. So it's nice to know that no other disk drive is closer to fail-safe than our UniDisk 3.5.

Because no other company has our dedication to quality. Our concern for reliability.

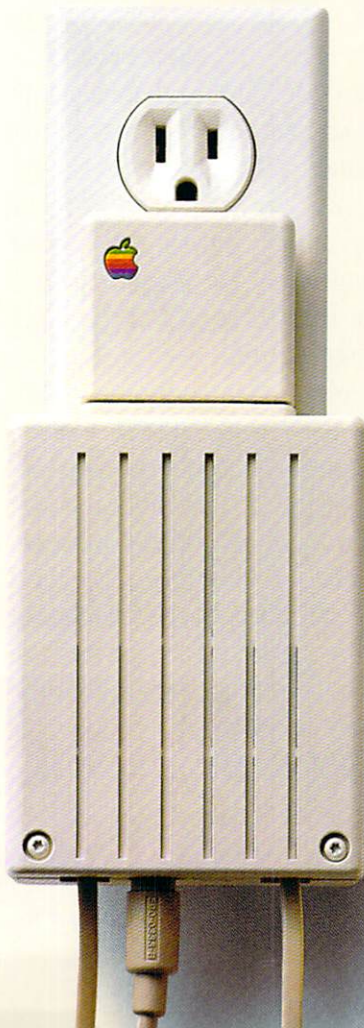
Or our drive.



Coming Soon: The biggest Apple IIe in memory.

The Apple II Memory Expansion Card should be on dealer shelves soon.

Before long, you'll be able to instantly and easily add another 256K, 512K, 768K or full megabyte of RAM to your Apple II, II+ or IIe. Making it one of the most powerful personal computers in its class. Or business. Or home.



Snow white and dwarf monthly payments.

Once upon a time, most people had to dwindle their checking accounts down to the right side of the decimal point in order to buy an Apple.

Or stretch their charge cards to the place where they didn't have a choice but to leave home without them.

Then, mercifully, our finance department invented the Apple Credit Card.



Apple Computer, Inc.

1234 123456 7
APPLECARD

With an Apple Credit Card, you may qualify for up to \$2,500 of instant credit to spend on the Apple computer or peripherals of your choice.

And, from now until December 31st, 1985, we'll generously waive the 10% down payment.

Which means the only thing you'll have to come up with are the small monthly payments.

Getting your Apple Credit Card is almost as easy as breathing. All you need is another major credit card. And a valid I.D.*

Which means, that very same

day, you'll be able to take your new Apple home.

Where you'll both live happily ever after.

Group therapy for Apple users.

Have you ever felt like you needed help—serious help—with your Apple, but didn't know where to turn?

Then we suggest you join an Apple Users Group.

From Kennebunkport to Kaanapali, Apple Users Groups are springing up by the dozen.

They meet to discuss ProDOS™,

Pascal and WPL. Exchange public domain software. Demonstrate new products. Listen to guest speakers.

And provide the kind of moral support that comes in handy after "Range error" has popped up on your DOS 3.3 screen for the 42nd consecutive time.

Many groups publish regular newsletters and magazines. And operate bulletin boards that let you get the information you want from the comfort of your own modem.

But the most important thing to know about Apple Users Groups, is that they're not just for hackers. In fact, most members have only novice or intermediate computing skills. Which is why they join in

the first place.

To get in touch with the Apple Users Group in your area, check with your local authorized Apple dealer.

With over 400 Apple Users Groups already in existence throughout the U.S. and Canada, chances are the help you need is right around the corner.

Your computer should join a health club.

Computers—even Apples—can sometimes be temperamental little devils.

And if something goes wrong with yours after the 90-day limited warranty expires, you're the one who'll be out of shape.

Unless you get AppleCare.SM

AppleCare is our extended service contract that covers the cost of parts and labor for up to three years. And the annual fee is usually about half the cost of a single repair.

You can buy AppleCare from your participating authorized Apple dealer. And the contract will be honored at more than 2,400 Apple dealers across the country.

So even if you decide to move to some out-of-the-way place like Keokuk, your AppleCare coverage will go along with you.

Although we can't guarantee your family will.

Introducing the health care plan for your Apple.



*By major, we mean MasterCard, VISA, American Express, Diner's Club and Carte Blanche. Certain restrictions may apply. © 1985 Apple Computer, Inc. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. ProDOS, DuoDisk, UniDisk, ImageWriter and AppleTalk are trademarks of Apple Computer, Inc. AppleCare is a service mark of Apple Computer, Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. and is being used with its express permission. Catalyst is a trademark of Quark Incorporated. Instant Pascal is a trademark of Think Technologies. Dazzle Draw is a trademark of Broderbund, Inc. Stickybear is a trademark of Optimum Resource, Inc. Blazing Paddles is a registered trademark of Baudville, Inc. SuperCalc is a trademark of Sorcim Corporation. PFS is a registered trademark of Software Publishing Corporation. Mouse Calc is a trademark of Version Soft. Hayes is a registered trademark of Hayes Microcomputer Products, Inc. For an authorized Apple dealer near you, call (800) 538-9696. In Canada, call (800) 268-7796 or (800) 268-7637.

dents confined to wheelchairs. You can even inquire as to why a particular school was left out!

Do you still want more information? *College Directions* can also print (if you have a printer) a personalized letter to any of the colleges in its data base for that purpose. It even contains a form letter for accepting or declining an invitation to join a freshman class! If you leave the program and return at a later date, the program will welcome you back and tell you it still remembers your last answers if you wish to use them. (That's what I call user-friendly.)

Both the Peterson and Jefferson programs are available in two-year college and trade school versions.

FEWER SELECTIONS BUT MORE COMMENTARY

If you want to deal with a more select group of colleges, you might want to use the "Fiske Disk." Properly called *Peterson's College Selection Service Software* (\$79.95), its data base is limited to those schools chosen by Edward Fiske, the education editor for *The New York Times*.

Fiske's program includes 275 of

the most competitive schools, selected from all sections of the country. One of the advantages to this packet is Fiske's well written, personal narrative on each school, which accompanies the disk. You will read such descriptions as "Students report that living conditions are dismal, with dormitories noisy and poorly maintained," or alternatively, "there are college athletic events galore, professional sports nearby, and wonderful facilities. . . ."

An even more restrictive program—this one by John Wiley & Sons—is *100 Top Colleges, How to Choose and Get In* (\$35). John McClintock, the author, selected those colleges that drew one-fifth or more of their freshman class from outside their region and reported that 70 percent of the entering freshmen remained to graduate. Rather simple criteria, but ones that make these schools desirable.

McClintock's school criteria are often unique and sometimes open to debate. They include a rating of the motivation of the student body—"assertive, active, or receptive." He also tries to evaluate the teaching style, social life, and creative philosophy

characterizing each school.

Educational Planning, Inc. produces another program similar to Fiske's and McClintock's: *College Decisions*. A select group of schools are represented in the data base—303 to be specific. Brenda and Rochelle Liebling, the coauthors of this simple program, chose to use only seven selection criteria.

As with the other "selective" programs, the Lieblings offer their own evaluation of each school. Their comments are a little less formal, and mention not only information one would expect, such as required courses, but esoteric facts as well, such as campuses where prohibitions on dancing exist.

The great simplicity of McClintock's and Lieblings' software can be both an advantage and a handicap. It narrows down your choices, but can also lead you on a wild-goose chase. Dean Robert Seavy of the Stevens Institute of Technology in Hoboken, New Jersey, contends many high schoolers are led astray by college selection systems that are too broad. He sees many inquiries from potential students who, after using the software, know only that Stevens offers a degree in "engineering," without knowing which kind of engineering.

One factor that is becoming increasingly important to college-bound students is financing. How do you afford to attend the college of your choice?

Peterson's Guides produces *Peterson's Financial Aid Services*. This program helps the user calculate anticipated college costs, develop a profile of the family's ability to afford the education, estimate the need for additional financing, and locate government and private sources of funding.

A second software package is available from Jefferson. *Scholarships Today* introduces the student to federal and state financial-aid programs and the requirements for each. Eligibility criteria, dollar limitations and application deadlines for Pell Grants, for example, are presented.

Software is available to help you clarify factors important to you in selecting a college. It can determine which schools meet those criteria and provide a description of those schools. And it can help you to develop an orderly approach to gaining college admission and arranging for the financing of an education. The computer can present important information to your family, so that, with its help, you can plan wisely for the future. ☐

PREPARE WITH SAT SOFTWARE

Juniors and seniors: Before you decide on a college, it's helpful to know what SAT (Scholastic Aptitude Test) or ACT (American College Testing Assessment) scores may be important for admission. Although last-minute cramming can't replace long-term, careful preparation in academic courses, computer software is available that can provide test practice. (See also "Clear the SAT Hurdles" in the July issue of FAMILY COMPUTING.)

Some programs offer timed drill-and-practice sessions using sample questions in SAT format. This often can prevent "pretest jitters," and may help improve scores during re-takes of the test. Other programs include features such as math and verbal lessons; strategy hints on how to solve analogies, and when to guess vs. when to do calculations; study plans; diagnostics; or even on-screen graphics for math questions!

CompuServe also maintains a small reference section from the College Entrance Examination Board, with advice on SAT preparation, and test dates and fees.

The College Board advises extensive study in many areas as the best preparation. In any case, students should find a method that best suits their academic needs, and then con-

centrate on developing those skills, whether verbal or mathematical. Here's a sample of what's available in software (Good luck!):

Barron's Computer Study Program for the SAT (Barron's Educational Services), 48K Apple II series, C 64, 128K IBM PC/PCjr, \$90.

Computer Preparation for the SAT (Harcourt Brace Jovanovich), 48K Apple II series, 48K Atari, C 64, 64K IBM PC/PCjr, 48K Tandy Models III/4; \$80.

Hayden SAT Score Improvement System (Hayden Software), 48K Apple II series and 128K Macintosh, 48K Atari 800/800XL, C 64, 128K IBM PC (with color graphics adapter)/PCjr; \$100.

Lovejoy's Preparation for the SAT (Simon & Schuster), 64K Apple II series, C 64, 128K IBM PC/PCjr, \$70.

Mastering the SAT and Mastering the ACT (CBS Software), 48K Apple II series, 128K IBM PC/PCjr, \$100; C 64, \$80.

The Perfect Score: Computer Preparation for the SAT (Mindscape), 48K Apple II series, C 64, 128K IBM PC/PCjr; \$70.

PSAT/SAT Analogies (Eduware), 48K Apple II series; \$30.

—ELIZABETH OAKES

HOME/MONEY MANAGEMENT

CHOOSING THE RIGHT TYPE OF HOME-FINANCE PROGRAM

BY MATTHEW STERN

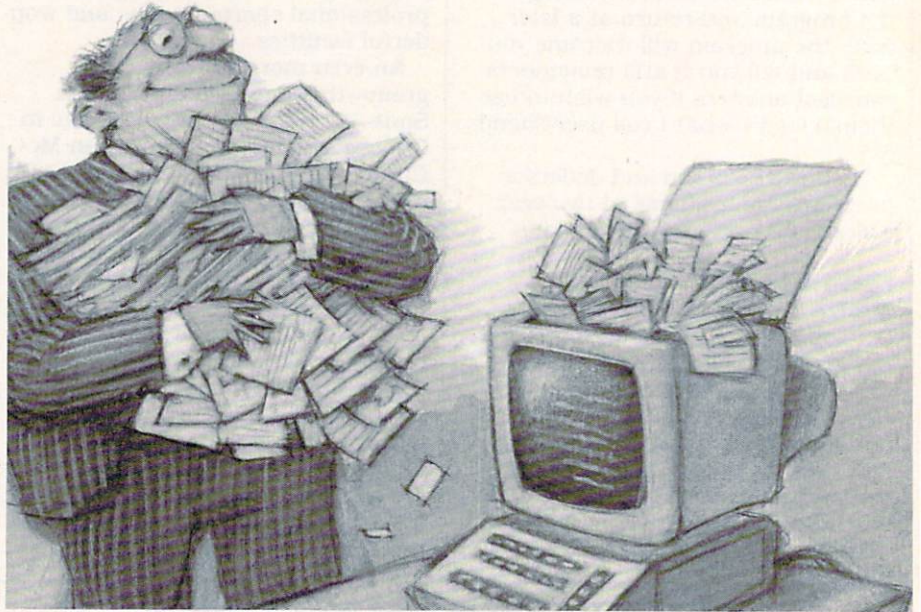
Money can be the root of all anxiety. Credit cards, household expenses, taxes, college costs, and the like can put a lot of pressure on you and your family. You can get your finances under control with proper record-keeping and planning.

Fortunately, this is a task your computer can easily do with the right software. Unfortunately, finding the right financial software for your home can be as confusing as doing a tax return. There are many different types of home financial packages for many different machines. The wrong choice can cost you money and time.

I know this from personal experience. I once had a problem with my checking account. My checks were bouncing, and I didn't have the slightest idea what my balance was. I decided it was high time to get a program to reconcile my checkbook. My software dealer recommended what he thought was the *best* home-finance program for my computer: a full-blown accounting program. When I took it home, I discovered that I had to track down assets and liabilities, project budgets, and learn the accounting system before I could enter a single check. Rather than do this extra work, I let the program sit on my shelf while my checking account got more and more out of balance. Finally, I found a simple checkbook program. All I had to do was enter my checks, deposits, and drafts, and reconcile my bank statement at the end of the month. It was exactly what I needed. For the first time in months, my checkbook was in balance.

This experience taught me several things. First, there are many different types of financial software available. Not all of them are the same, and each one has a different approach. Second, I could have saved myself a lot of money and grief by deciding what I wanted the software to do before heading off to my local computer store.

MATTHEW STERN, a freelance computer-magazine writer, writes documentation for productivity software packages.



THERE'S MORE THAN ONE WAY TO BALANCE A BUCK

Each home-finance program is designed to solve a certain set of financial questions. Although programs differ, they can be assembled into four general categories:

1. Checkbook programs. These let you enter checks and deposits, and reconcile your balance at the end of the month. The more elaborate programs calculate total expenses and income, remind you of automatic payments, and print out checks.

2. Budget programs. These let you plan a budget and compare it with your actual performance. Some programs also monitor your assets, liabilities, and net worth.

3. Financial-planning programs. These help you make important financial decisions by experimenting with trends and budgets. Some programs help you prepare for taxes, while others calculate loan payments, plan IRAs, etc.

4. Integrated financial programs. These combine several of the features mentioned above into a single package. Most of them combine a checkbook with a budget program, while a few can also help you with financial planning.

To select the right program, you must first determine which financial

problems you want solved. In my case, it was balancing my checkbook. It is equally important to decide how much time and effort you are willing to invest in your program. While my full-scale accounting program could balance my checkbook, the preparation wasn't worth my time.

I've illustrated these different categories by giving examples from specific programs. Since there are many programs in each category, the examples are merely representative.

BALANCING YOUR CHECKBOOK

The checkbook program is the simplest type of home-finance software. All you need to do is enter your checks and deposits from your checkbook, mark off the items cleared by the bank, and enter your balance from your bank statement. The program does all the calculations, and tells you if you're balanced.

With *Quicken* (by Intuit, Inc. for 128K Apple IIe/IIc, \$79; 192K IBM PC/PCjr, \$99), you "write out" checks by entering information on a form similar to the checks you already use. Deposits, transfers, fees, interest, and other transactions are entered into a "check register," which looks like the register in your regular checkbook. When you receive

IF YOU CAN FIND A BETTER PROGRAM WE'LL BUY IT FOR YOU!*



WORD WRITER with Spell Checker

Now with 85,000 word Spelling Checker

- An efficient, 80-column professional word processing system which includes a spelling checker and built-in calculator.
- Contains all the features you'll need for everyday word processing, plus most of the sophisticated features found in more expensive programs: document chaining, form letter printout, page separations, horizontal and vertical scrolling, and more.

With Timeworks you get more power for your dollar

You can use each program alone. Or interface this trio – one at a time if you like – into a completely integrated productivity system that delivers all the power and features most of you will ever need . . . at a cost that lets you enjoy their use.

Look for these and other Timeworks programs at your favorite dealer. Or contact Timeworks, 444 Lake Cook Road, Deerfield, IL 60015. Phone: (312) 948-9200.

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Faster, more efficient, more versatile

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- Exclusive X-SEARCH, X-SORT, and X-CHART features allow you to cross-search any category of information; sort items alphabetically, numerically, or by date; break down statistical information into categories; and graphically view your results.

With Timeworks you get more than software

You Get Our Customer Technical Support Team

At the other end of our toll-free hotline, you'll find our full-time Customer Technical Support Team. Free of charge to all registered users.

You Get Our Liberal Trade-Up Policy

You'll find the details inside each package.

SWIFTCALC with SIDEWAYS

New easy-to-use spreadsheet for home and small business use

- The SIDEWAYS option lets you print all your columns on one, continuous sheet . . . sideways.
- 250 rows and up to 250 columns (128K version) provide up to 62,500 cells (locations on the spreadsheet) in which to place information.
- Performs mathematical functions up to 17 digits. Allows the use of minimum and maximum values, averages, sums, integers, absolute values and exponential notation.

* With Timeworks you get our Money Back Guarantee

If you can find anything that works better for you, simply send us your Timeworks program, your paid receipt, and the name of the program you want, along with your check or credit card number for any retail price difference. If it's available, we'll buy it for you.**

For Apple, IBM, Commodore 128 (128K) & Commodore 64 Computers



More power for your dollar.

Other Timeworks Programs:

- The Evelyn Wood Dynamic Reader
- Sylvia Porter's Personal Finance Series
- Swiftcalc ■ Cave of the Word Wizard
- Business Systems ■ Wall Street
- The Electronic Checkbook
- The Money Manager

** Offer valid for 90 days from date of purchase.

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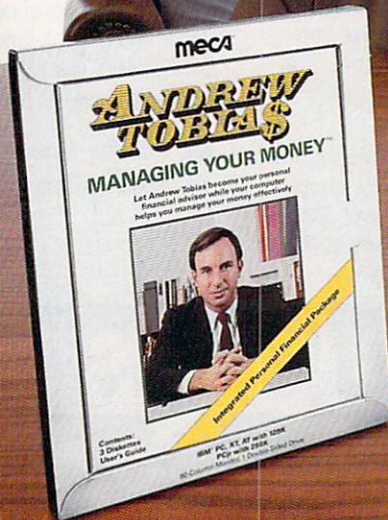
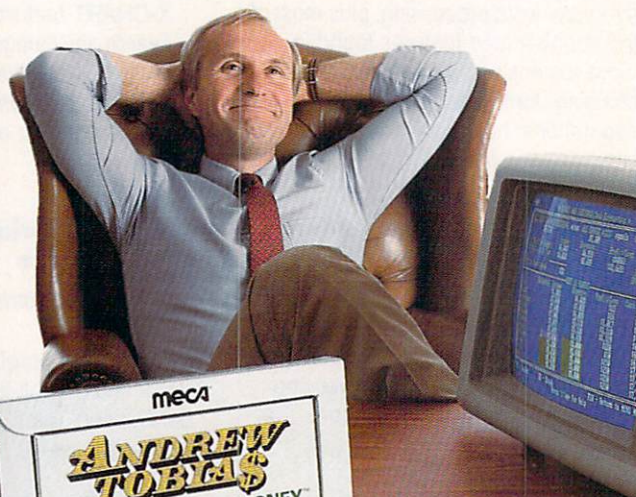
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These programs interface with each other
Now available for Commodore 128

MANAGING YOUR CHECKBOOK?
 MANAGING YOUR BUDGET?
 MANAGING YOUR BILLS?
 MANAGING YOUR CASH FLOW?
 MANAGING YOUR TAXES?
 MANAGING YOUR INSURANCE?
 MANAGING YOUR STOCKS?
 MANAGING YOUR BONDS?
 MANAGING YOUR REAL ESTATE?
 MANAGING YOUR TAX SHELTERS?
 MANAGING YOUR SAVINGS?
 MANAGING YOUR MORTGAGE?
 MANAGING YOUR AUTO LOAN?
 MANAGING YOUR RETIREMENT?
 MANAGING YOUR CALENDAR?
 MANAGING YOUR CHARGE ACCOUNTS?
 MANAGING YOUR CAPITAL GAINS?
 MANAGING YOUR ANNUITIES?
 MANAGING YOUR APPOINTMENTS?
 MANAGING YOUR DIVIDENDS?
 MANAGING YOUR INTEREST?
 MANAGING YOUR RECORDS?
 MANAGING YOUR VALUABLES?
 MANAGING YOUR KEOGH'S?
 MANAGING YOUR IRAS?



MANAGING YOUR MONEY®
 BY ANDREW TOBIAS.
 THE ONLY FINANCIAL
 SOFTWARE THAT DOES IT ALL.



Software that
 makes your
 personal computer
 worth having.

meca®

HOME/MONEY MANAGEMENT

your statement from the bank, mark off cleared transactions by entering an asterisk (C in the Apple version) into the CLR column. Type in your ending balance from your bank statement, and *Quicken* does all the calculations. If the entries are correct, your checkbook will be balanced. Before using any checkbook program for the first time, you should reconcile the account on paper so you start with a correct balance.

Quicken will also print checks, but you need special forms from Intuit. Some checkbook programs let you print on your bank checks. Find out which forms you need before buying a program.

Checkbook programs are the easiest to learn of all home-finance software. You'll probably need only a few hours each month to key in your checks and reconcile your bank statement. Minimal preparation is required, as long as you accurately enter all your transactions in your checkbook. Most checkbook programs will *not* do any sophisticated financial planning. If you would like to do budgeting or financial planning later on, you should either get a checkbook program that calculates your expenses and income, or spend a little more for an integrated financial program.

BALANCING THE BUDGET

The key to controlling your finances is knowing not only how much you have, but how much you spend. A budget program helps you do both. You enter how much you earn and spend, and then compare it to your projections. This exercise will help you establish goals and make better financial decisions.

Lifepan (by Lifeware, Inc. for Commodore 64, \$60; version planned for Apple IIe/IIc and C 128) lets you create a budget and compare your actual expenditures to it. Your receipts and expenses are entered from checkbooks, credit card slips, and bills. The *Lifepan* manual suggests a simple filing system to keep your records organized for entering. Once you close out your records for the month, you can examine the totals on tables and graphs

HOME-FINANCE SOFTWARE COMPANIES

ELECTRONIC ARTS, (415) 572-ARTS
INTUIT, INC., (415) 322-0573
LIFEWARE, INC., (206) 322-5454
MECA (MICRO EDUCATION CORPORATION OF AMERICA), (800) 631-MECA
MONOGRAM, (213) 215-0355

to see how they actually compare to your predictions. *Lifepan* also stores totals throughout the year so you can watch your progress.

Budget programs like *Lifepan* require some effort and thought on your part. To get an accurate picture of your finances, you will need to keep careful records of your assets, liabilities, income, and expenses. You'll then be able to determine how much you need to spend, and where cuts can be made.

PLANNING AHEAD

Would I be better off leasing or buying a new car? How can I spend less on taxes next year? Financial-planning programs answer these and many other questions. You enter the pertinent financial information, and these programs show the results of your decisions. Most of these programs let you experiment with figures, so you can also try out different possibilities.

Electronic Arts' *Financial Cookbook* (64K Apple II, 48K IBM PC/PCjr, 128K Macintosh, \$50; 48K Atari, C 64, \$40) consists of 32 "recipes" for solving specific financial problems. Suppose you want to find out how much it would cost to buy a car. You enter the purchase price, the amount financed, the length of the loan and its interest rate, the amount of time you plan to keep the car, and its estimated value when sold. If you plan to use the car for business, you would also enter the investment tax credit and percentage of business use. *Financial Cookbook* calculates how much you'll *really* spend on the car and what your tax savings will be.

Tax programs are another type of financial-planning program. Monogram's *Forecast* (48K Apple II plus/IIe/IIc, available for \$60; 128K Macintosh, \$70) lets you estimate your taxes for the next few years, so you can determine ways to save money. Other programs prepare tax returns for you. If a tax program is on your shopping list, be sure it reflects the current tax laws or can be changed to do so. Otherwise, you may be stuck with an obsolete program. (Look for an article on the newest tax software in the February 1986 issue of *FAMILY COMPUTING*.)

Financial programs like these are used for solving specific problems. Before buying a specialized financial planning program, however, determine what financial problems you want solved and see if the program will do the tasks you need. →

MANAGING
YOUR MONEY®
IS NOW
AVAILABLE ON
APPLE
IIe AND IIc.

Special
Introductory Edition!

Contains both 5¼" and
new 3½" UniDisk 3.5"
disk formats



APPLE IIe, IIc (128K, 80-Column Monitor, Two Drives)

HOME/MONEY

THE ALL-IN-ONE PROGRAMS

An integrated home-finance program wraps many financial tasks into one package. MECA's *Andrew Tobias' Managing Your Money 2.0* (128K Apple II with two disk drives, 128K IBM PC/PCjr, \$99) contains a checkbook, budget program, and additional sections for managing your stock portfolio, planning insurance policies, estimating taxes, and performing other financial calculations. *Managing Your Money* lets you use some or all of the sections, as needed. You may decide to use only the financial calculator, or you may use the complete program to find out what, for example, your taxes and net worth would be if you sold a certain amount of stock.

Integrated home financial packages tend to cost more than other finance programs and may require additional time to set up balances and record inventories. Besides, they may only be available on certain machines, like the IBM and the Apple. (Note: Timeworks' *Sylvia Porter's Personal Financial Planner* also runs on Commodore computers.) However, integrated programs give you more flexibility than other home-finance software, and also provide the convenience of having all your crucial calculations done with one program.

Once you've narrowed down your choices to a specific category, you still need to pick one special program that will do the job. There are many places where you can go for information on the programs.

First, ask your computer dealer which products are available for your computer in your selected category. (Also check "Putting Your Finances In Order" in the January FAMILY COMPUTING for a list of available programs.) Find out if the program really performs the tasks you need. You should also ask if you need additional memory, peripherals, or special forms for checks. Request a hands-on demonstration. Before you buy, ask people who have used the product. Users' groups are other good sources for information. Finally, find out if your dealer or software manufacturer provides technical assistance if something goes wrong.

With the right program, you will be able to make better financial decisions. The money you can save will make your computer and home-finance software worthwhile investments. **FC**

LITTLE PEOPLE INSIDE OUR COMPUTERS: GETTING TO KNOW THEM.

The dust has settled by now. Things are returning to normal (or what passes for normal) at the sprawling Activision research complex in Mountain View, California. The glamour and excitement of last spring's discovery of little people living inside computers have given way to the hard work of round-the-clock production of The Activision Little Computer People Discovery Kit.[™]

But, in million of homes all over America, the excitement is just beginning.

Owners of Commodore 64[™] and 128[™] and Apple II series computers are getting to know their very own Little Computer People (LCP). And some surprising things are being learned.

THE STORY SO FAR

Little computer people, of course, are the small human-like beings believed to be responsible for glitches, garbled syntax, bugs and other so-called "computer errors."

While the media attention has focused on such mundane research efforts as plasmamemory, artificial intelligence and sixth-generation supercomputers, the real action, science-wise, has been in the LCP field.

"Each LCP we've observed so far is a real individual, but we have noticed certain common traits," comments David Crane, leader of Activision's LCP research team.

"For example, they all seem to enjoy playing music on their pianos (although their musical tastes vary), and they love dancing and aerobic exercise. They like playing card games, too, and will probably try to get you to play with them.

"We haven't been able to decipher their spoken language yet," Crane continues, "but apparently they've been studying our word processing programs, and they've learned to communicate

in written English using the typewriters we've placed in the 2½ story electronic dream house, or House-on-a-Disk[™] that we've created for them."

The LCP also have their emotional side, Crane says. "Like anyone, they need an occasional pat on the head, a little attention. In fact, we think the previous lack of attention is what led them to cause all that mischief."

BRINGING THE MIRACLE HOME

LCP research has continued at a feverish pace. But because every LCP studied so far has been different, Activision scientists consider it vital that as many people as possible contact their own LCP so that a firmer statistical base can be established.

To this end, tireless Activision researchers have been working day and night to perfect and produce adequate quantities of The Activision Little Computer People Discovery Kit, the amazing research apparatus that allows computer owners to meet their own LCP.

The Discovery Kit includes The Little Computer People[™] House-on-a-Disk[™] Research Software that is guaranteed to lure out at least one LCP; the computer owner's guide to the care of and communication with Little Computer People; deed of ownership for the House-on-a-Disk; and a Special Edition of *Modern Computer People* magazine — all the tools needed for observation, interaction, communication and, perhaps, a meaningful relationship.

Some people are still skeptical. Some people will *always* be skeptical. But science has spoken. There *are* little people living inside computers. The only question is whether you've met the one living in yours yet.

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TELECOMPUTING

FASTER THAN A SPEEDING BULLET . . . IT'S A BIRD . . .
IT'S A PLANE . . . IT'S . . .

Electronic Mail

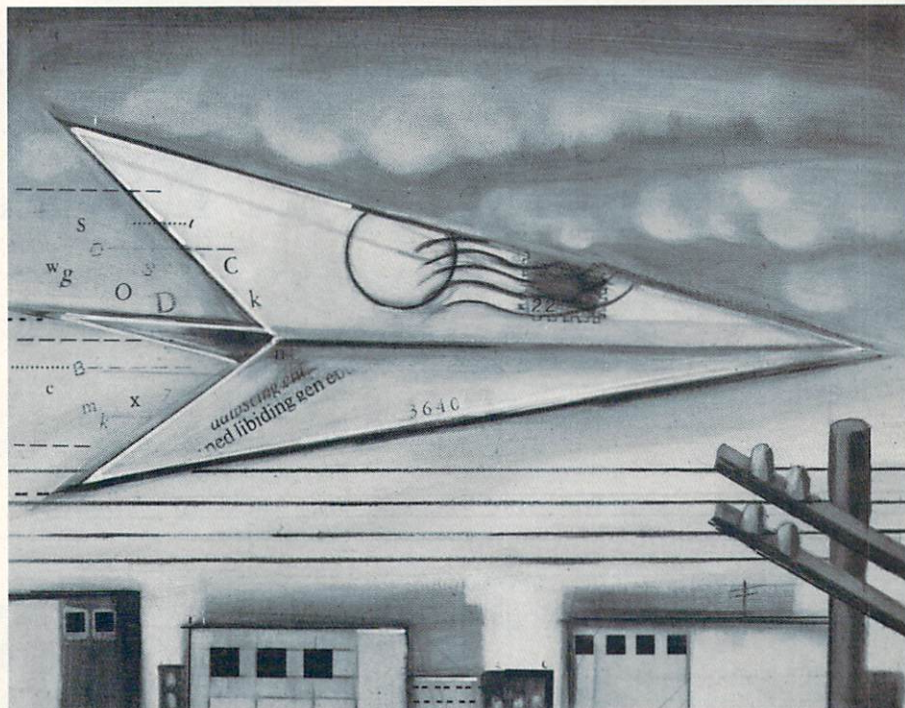
BY NICK SULLIVAN

The pony express was a great delivery service: it allowed people to send documents long distances for a modest fee. The invention of the telephone topped that, allowing people to communicate in "real time" (as computer people say) by voice. While not as revolutionary as either the U.S. Postal Service or the long-distance phone system, "electronic mail" combines the best elements of both. And in both small and major ways, electronic mail is changing the way people work and communicate.

"E-mail" services allow you to send documents over the phone lines to someone with an account number on that same service (see listing). While you need a computer and modem to send electronic mail, some services allow people who don't have computers to receive it. The message is hand-delivered via messengers or the U.S. Postal Service. A recipient of e-mail who is using another computer signs onto the service via his or her exclusive electronic mail account number (007-007, for example), checks the electronic "mailbox," reads the "mail" on-screen, saves it to disk and/or prints it out, and then can delete the message.

For people who are freelancing or running small businesses from home, the ability to sit at a computer keyboard and instantly reach thousands of potential clients or customers is a huge—and I mean huge—advantage. You can do this by setting up a DISTRIBUTION list of, say, 1,000 names, and then send the same letter to all of them by hitting RETURN! To a certain extent, electronic mail allows people to communicate on an equal basis with bigger businesses, because both are using the same tools.

And, of course, electronic mail helps all business people work more efficiently by ending the tedious (if time-honored) ritual of "telephone



tag." Instead of returning to your desk to find a pile of indecipherable "While You Were Out John Smith Called" messages, you can look in your electronic mailbox and find the delicate information that John Smith couldn't leave in a phone message.

For those who use the computer to pay bills, shop, and generally take care of monthly business, the capability to send letters from the computer increases its value as a workstation.

Electronic mail also allows people with common interests (e.g., lawyers, librarians, farmers, political action groups, etc.) around the country to talk and form tight networks to exchange information and ideas.

LIFE IN THE STICKS

I am well aware of the advantages of electronic mail. I'm a staff editor at FAMILY COMPUTING, but thanks to the bounty of my employers and the benefits of a computer-phone hookup, live most of the time in a rural area on the Massachusetts coast, about 200 miles from the New York office. The phone service is terrible, but that's another story. Despite

this and other minor kinks, the arrangement works. And it wouldn't without electronic mail.


At the beginning and end of each day, I sign onto CompuServe and read or leave messages via its EasyFlex mail system. Moneywise and timewise, this method beats making five fruitless phone calls to convey a simple message to one person. If I have written or edited a manuscript, I can send it easily over the phone lines. No one has to go to the post office, no one has to wait, and no one has to wonder whether the document in question "made it."

ELECTRONIC AND PAPER MAIL

E-mail's electronic advantage can also be a flaw. Many people who are used to taking paper out of an envelope don't like signing onto a computer system and reading a message on a screen. Fortunately, there's an antidote for this disease. You can, as noted above, send electronic mail on paper!

There are two basic types of electronic mail systems. General-purpose information services, such as CompuServe and The Source, offer

Senior Editor NICK SULLIVAN lives 200 miles from FAMILY COMPUTING's New York office and communicates by electronic mail.



SOME HISTORIC BREAKTHROUGHS DON'T TAKE AS MUCH EXPLAINING AS COMPU SERVE.

But then, some historic breakthroughs could only take you from the cave to the tar pits and back again.

CompuServe, on the other hand, makes a considerably more civilized contribution to your life.

It turns that marvel of the 20th century, the personal computer, into something useful.

Unlike most personal computer products you read about, CompuServe is an information service. It isn't software. It isn't hardware. And you don't even have to know a thing about programming to use it. You subscribe to CompuServe—and 24 hours a day, 7 days a week, it puts a universe of information, entertainment and communications right at your fingertips.

A few of the hundreds of things you can do with CompuServe.

COMMUNICATE

EasyPlex™ Electronic Mail lets even beginners compose, edit, send and file messages the first time they get online. It puts friends, relatives and

business associates—anywhere in the country—in constant, convenient touch.

CB Simulator features 72 channels for “talking” with thousands of other enthusiastic subscribers throughout the country and Canada. The chatter is frequently hilarious, the “handles”

unforgettable, and the friendships hard and fast.

More than 100 Forums welcome your participation in “discussions” on all sorts of topics. There are Forums for computer owners, gourmet cooks, veterinarians, pilots, golfers, musicians, you name it! Also, Electronic Conferencing lets businesses put heads together without anyone having to leave the shop.

Bulletin Boards let you “post” messages where thousands will see them. You can use our National Bulletin Board or the specialized Bulletin Boards found in just about every Forum.

HAVE FUN

Our full range of games includes “You Gussed It!”, the first online TV-style game show you play for real prizes; and MegaWars III, offering the

ultimate in interactive excitement. And there are board, parlor, sports and educational games to play alone or against other subscribers throughout the country.

Movie Reviews keep that big night at the movies from being a five star mistake.

SHOP

THE ELECTRONIC MALL™ gives you convenient, 24-hour-a-day, 7-day-a-week shopping for name brand goods and services at discount prices from nationally known stores and businesses.

SAVE ON TRIPS



Travelshopper™ lets you scan flight availabilities (on virtually any airline—worldwide), find airfare bargains and order tickets right on your computer.

Worldwide Exchange sets you up with the perfect yacht, condo, villa, or whatever it takes to make your next vacation a vacation.

A to Z Travel/News Service provides the latest travel news plus complete information on over 20,000 hotels worldwide.



MAKE PHI BETA KAPPA

Grolier's Academic American Encyclopedia's Electronic Edition

delivers a complete set of encyclopedias right to your living room just in time for today's homework. It's continuously updated... and doesn't take an inch of extra shelf space.



The College Board, operated by the College Entrance Examination Board, gives tips on preparing for the SAT, choosing a college and getting financial aid.

KEEP HEALTHY

Healthnet will never replace a real, live doctor—but it is an excellent and readily available source of health and medical information for the public.

Human Sexuality gives the civilization that put a man on the moon an intelligent alternative to the daily "Advice to the Lovelorn" columns. Hundreds turn to it for real answers.

BE INFORMED

All the latest news is at your fingertips. Sources include the AP news wire (covering all 50 states plus national news), the Washington Post, USA TODAY Update, specialized business and trade publications and more. You



can find out instantly what Congress did yesterday; who finally won the game; and what's happening back in Oskaloosa with the touch of a button. And our electronic clipping service lets you tell us what to watch for. We'll electronically find, clip and file news for you...to read whenever you'd like.

INVEST WISELY

Comprehensive investment help just might tell you more about the

stock you're looking at than the company's Chairman of the Board knows. (Don't know who he is? Chances are, we can fill you in on that, too.) CompuServe gives you complete statistics on over 10,000 NYSE, AMEX and OTC securities. Historic trading statistics on over 50,000



stocks, bonds, funds, issues and options. Five years of daily commodity quotes. Standard & Poor's. Value Line. And more than a dozen other investment tools.

Site II facilitates business decisions by providing you with demographic and sales potential information by state, county and zip code for the entire country.

National and Canadian business wires provide continuously updated news and press releases on hundreds of companies worldwide.

GET SPECIALIZED INFORMATION

Pilots get personalized flight plans, weather briefings, weather and radar maps, newsletters, etc.

Entrepreneurs use CompuServe too for complete step-by-step guidelines on how to incorporate the IBMs of tomorrow.

Lawyers, doctors, engineers, military veterans and businessmen of all types use similar specialized CompuServe resources pertinent to their unique needs.

And now for the pleasant surprise.

Although CompuServe makes the most of any computer, it's a remarkable value. With CompuServe, you get low start-up costs, low usage charges and local phone-call access in most major metropolitan areas.

Here's exactly how to use CompuServe.

First, relax.

There are no advanced computer skills required.

In fact, if you know how to buy breakfast, you already have the know-how you'll need to access any subject



in our system. That's because it's "menu-driven," so beginners can simply read the menus (lists of options) that appear on their screens and then type in their selections.

Experts can skip the menus and just type in "GO" followed by the abbreviation for whatever topic they're after.

In case you ever get lost or confused, just type in "H" for help, and we'll immediately cut in with instructions that should save the day.

Besides, you can either ask questions online through our Feedback service or phone our Customer Service Department.

How to subscribe.

To access CompuServe, you'll need a CompuServe Subscription Kit, a computer, a modem to connect your computer to your phone, and in some cases, easy-to-use communications software. (Check the information that comes with your modem.)

With your Subscription Kit, you'll receive:

- a \$25 usage credit.
- a complete hardcover Users Guide.
- your own exclusive user ID number and preliminary password.
- a subscription to CompuServe's monthly magazine, *Online Today*.

Call **800-848-8199** (in Ohio, 614-457-0802) to order your Subscription Kit or to receive more information. Or mail this coupon.

Kits are also available in computer stores, electronic equipment outlets and household catalogs. You can also subscribe with materials you'll find packed right in with many computers and modems sold today.



- Please send me additional information.
- Please send me a CompuServe Subscription Kit.
- I am enclosing my check for \$39.95, plus \$2.50 handling. (Add sales tax if delivered in Ohio.)

Please make check payable to CompuServe Information Services, Inc.

- Charge this to my VISA/MasterCard

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How to help a bright kid shine sooner.

Pixelwerks™ gives young minds a new place to play.

It's one thing to capture a young imagination. It's even better to help it grow.

That's precisely what Mindscape's Pixelwerks Series does for kids eight and up. All five Pixelwerks programs are creative tools to develop basic learning and computer skills.

Develop an author.

Bank Street StoryBook by George Brackett lets young authors create multi-page stories with animation. What seems like pure fun is actually building computer literacy, developing story-telling skills, and creative thinking.



Develop a director.

Show Director™ combines pictures, text, music, and sound effects for real showbiz excitement. Along the way, your young director is learning to integrate story elements, developing word processing skills, and writing creatively.



Develop an artist.

Mr. Pixel's™ Programming Paint Set, Cartoon Kit and new *Game Maker* are fully integrated programs. So individually or collectively they can provide hours

of fun. In the process, kids develop analytical thinking skills, improve concentration and reasoning abilities, and learn programming basics.

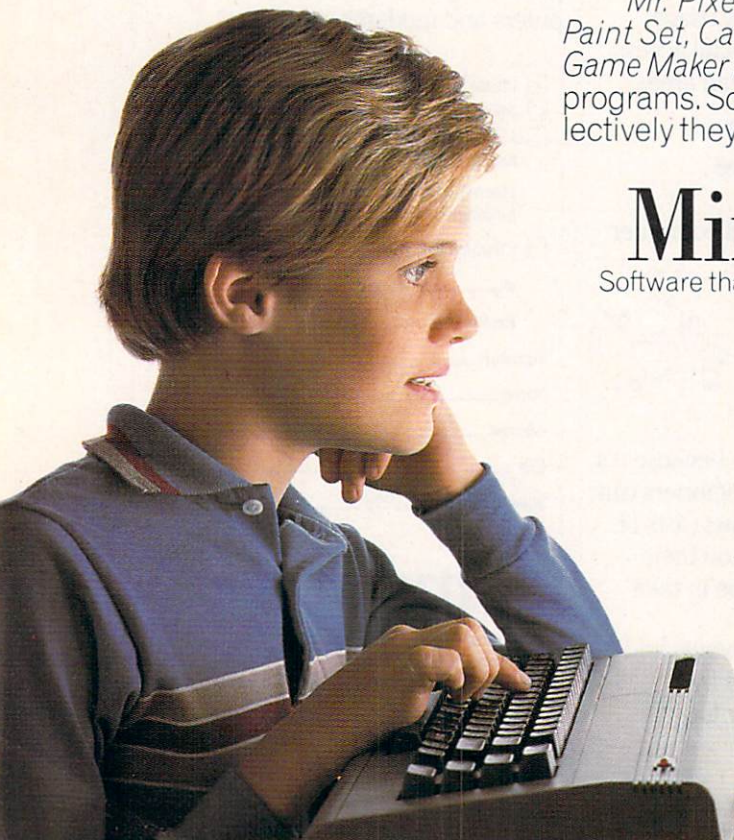


Imaginations need room to grow.

Mindscape's Pixelwerks Series is a playground filled with new skills waiting to be discovered.

So visit a software dealer for a demonstration. And shed new light on your child's future.

Pixelwerks is available for Apple II series, IBM PC, and Commodore.



Mindscape
Software that challenges the mind.



Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062
1-800-221-9884. (In Illinois 1-800-942-7315)

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TELECOMPUTING

e-mail systems that allow you to send electronic messages to other people or companies who subscribe to that network. But a CompuServe subscriber, say, can't send electronic mail to a Source subscriber or anyone else outside CompuServe.

Specialized e-mail delivery systems, such as MCI Mail and Western Union's EasyLink, are more versatile. They allow you to send electronic mail to system subscribers and paper mail to anyone.

Say you're sending a message from your computer in New York to someone in Los Angeles who doesn't have a computer, or doesn't subscribe to the same electronic mail service you do. You type the message on your

computer, and MCI or EasyLink sends it electronically across the country. Then it's printed out in Los Angeles and delivered by a two- or four-hour courier, an overnight messenger, or regular U.S. Postal Service delivery.

VOICE MAIL?

Yes, it's happening. We're getting closer and closer to a computer phone! AT&T is working on an electronic mail system that is currently only for "internal" purposes. But people who've used it say it's designed from top to bottom for general consumers. The kicker to this service is that you don't need a computer to receive your mail in-

stantly. You merely punch your code into the phone, and your mail is read to you by a synthesized computer voice.

So where does all this leave the U.S. Postal Service? What will electronic mail do to letter-writing? These weighty issues should be discussed around the kitchen table. However, there can be no doubt that electronic mail is changing the way we communicate.

The FAMILY COMPUTING Electronic Edition on CompuServe (GO FAM) is operated with modems supplied by Hayes Microcomputer Products, Inc. You can also leave electronic mail for FAMILY COMPUTING on The Source (account No. T15483).

LEADING ELECTRONIC MAIL SERVICES

EasyLink

COMPANY: Western Union, One Lake St., Upper Saddle River, NJ 07458; (201) 825-5000; (800) 445-4444

RATES: There is a \$25 monthly minimum usage plan, or a \$25 annual subscription with no monthly minimum. It costs 35-50 cents a minute to send an electronic message; \$1.50 for the first page of a computer letter (paper), 50 cents for each additional page; and \$3 for the first page of a Mailgram, 75 cents for each additional page. Telex costs 50-90 cents a minute. EasyLink *Instant Mail Manager* software costs \$150 (includes \$35 rebate for EasyLink).

DESCRIPTION: Western Union, the venerable telegraph company, has kept up with the times and now provides a comprehensive electronic mail service with over 130,000 subscribers. There's not much you can't do from your computer keyboard with Western Union's EasyLink: telegram, Cablegram, Mailgram, Telex, electronic mail, or letters (delivered on plain white bond paper). And when you're away from your computer for an extended period, you can ask that your electronic messages be forwarded to you by Mailgram.

Instant Mail Manager software (for 256K IBM and compatibles only) combines word processing and telecommunications, and is highly recommended. You can compose and edit off-line, then sign onto EasyLink and send the message. You can even send binary files, such as a graph from *Lotus 1-2-3*. It's as easy as pushing a FUNCTION key. Writing messages while online is not recommended, as you cannot edit a line once it's entered. Using EasyLink without *Instant Mail* software, however, can be difficult and unpleasant for the new user. Thus, the system's usefulness is pretty much restricted to IBM owners.

By using the EasyLink access phone numbers, you can also sign onto OAG (Official Airline Guide) and FYI (a data base with UPI news, and travel and investment information).

EasyPlex

COMPANY: CompuServe
ADDRESS: 5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, OH 43220; (614) 457-8600

RATES: Online connect charges at regular CompuServe rates; no additional fee for sending or reading mail.

DESCRIPTION: EasyPlex, available to all CompuServe subscribers, can be used with or without menus, depending on your level of expertise. Either way, the service is quite easy to use. You can send files you've created with your word-processing program, take files from your personal file area on CIS, or create messages online and send them to individuals.

EasyPlex doesn't allow you to send paper mail to nonsubscribers, but it does allow you to create a DISTRIBUTION list for mass mailings.

MCI Mail

COMPANY: MCI Digital Information Services Corp.

ADDRESS: 2000 M St. NW, Washington, DC 20036; (800) 424-6677

RATES: BASIC service (with menus), \$18 minimum charge per year; ADVANCED service (no menus), \$10 per month service charge.

Rates for both services: \$1 to send a 7,500-character electronic message; \$2 for an MCI letter, a one- or two-day paper message delivered by the U.S. Postal Service; \$8 for an overnight letter, paper-mail courier-delivered by noon the next day; or \$25 for a four-hour letter, courier-delivered to major cities within four hours.

DESCRIPTION: MCI, the company that jabbed at AT&T until its breakup, has also jabbed at the U.S. Postal Service's mail service with scathing television commercials. Now, while still in the shadows of both, the upstart communications company has about 200,000 subscribers to its two-year-old MCI Mail service.

MCI Mail allows you to send instant electronic messages to other MCI subscribers, and has a variety of hand-delivered paper-mail options (see above). All paper letters are delivered in bright, orange-colored envelopes that demand attention. But what really differentiates MCI's paper delivery from other services' is the use of your letterhead and signature upon request (\$20 each per year) which you can register with them. And your letterhead and signature will be laser-printed for a snappy-looking document!


MCI provides a "gateway" to Dow Jones News/Retrieval. In most respects, this is a benefit, but its listing of the day's headlines from Dow Jones before escorting you to the mailbox can be an annoying slowdown. In addition, the menus on MCI's BASIC service quickly may become a nuisance. The only way to get rid of them and directly enter commands (READ, CREATE, etc.) is to upgrade to the \$10 a month ADVANCED service.

Despite these drawbacks, the system is wonderfully easy to use, no matter what computer, modem, or software you own.

SourceMail

COMPANY: The Source
ADDRESS: 1616 Anderson Road, McLean, VA 22102; (800) 336-3366

RATES: Online connect charges at regular Source rates; no additional fee for sending or reading mail.

DESCRIPTION: SourceMail is available to all Source subscribers, and allows them to send messages (created online or off-line) to other Source subscribers. It's a versatile system with myriad options for sending and handling mail. You can, for instance, request an acknowledgment of a message, or you may "broadcast" mail in DISTRIBUTION lists you've set up. SourceMail is easy to use, but could be a little more fluid. For instance, if you type MAILSC (Mail Scan) you'll get an error message because the system expects a space between the two words, viz: MAIL SC. 

A new set of crayons for children of the computer age.

ColorMe nurtures creativity with child's play.

A child's imagination needs little more than tools and encouragement to flourish. That's why Mindscape created ColorMe: The Computer Coloring Kit.

Every child can shine with ColorMe. Kids from the age of four and up can compose pictures without previous artistic or computer

paste options using predrawn pictures.

ColorMe gives every artist room to grow.

With ColorMe, kids can draw, color, and print their own creations. Text can be integrated to create original stories. The room for creativity is limitless.

ColorMe Picture Disks make this



predrawn and ready to "cut and paste" for added color, excitement and fun.

You can even take the ColorMe Supply Box with adhesive-backed paper for stickers, colored papers, buttons, cards, envelopes, and a binder for original coloring books.



ColorMe. The creative computer coloring kit.

Open a new world of excitement for your child. ColorMe does more than crayons ever could. So ask your software dealer for a demonstration. Then take home the fun.

ColorMe is available on: Apple® and Commodore®

experience. The program disk can be used alone or with one or more optional picture disks for hours of freehand drawing and thousands of cut and

coloring kit extra special. Choose from Rainbow Brite™, Shirt Tales™, Hugga Bunch™, and TINK! TONK!™ These popular characters are

your software dealer for a demonstration. Then take home the fun.

Mindscape

Software that challenges the mind.



Mindscape, Inc. 3444 Dundee Road, Northbrook, Illinois 60062
1-800-221-9884. (In Illinois 1-800-942-7315)

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COMPUTING CLINIC

MULTISTATEMENT LINES IN BASIC • PCjr SOFTWARE AND HARDWARE • GRAPHICS PRINTERS • STATIC CLING • MEMORY AND COLOR FOR THE TIMEX SINCLAIR 1000 • PROGRAMS FOR ADAM

BY JEFFREY BAIRSTOW

Why does my computer frequently stop me from typing statements at the end of a multistatement line?

WAYNE D. MARKLE
Walden, New York

Almost all BASICs limit line length to a fixed number of characters. Some computers, like the Apple and Atari, beep when you've reached or exceeded the limit. The Apple lets you type six more characters, but doesn't accept them. If you type seven characters, the line is wiped out! Other computers, such as the ADAM, C 64, TI-99/4A, Tandy Models III/4/Color Computer, and VIC-20, won't let you type in more than the legal number of characters. The IBM PC will let you type forever, but only accepts 255 characters. The Macintosh stops you and displays a dialog box that says LINE TOO LONG.

Where can I find a PCjr, and will IBM and third-party manufacturers continue to produce PCjr hardware and software?

LARRY KLESSER
Branford, Connecticut

PCjr computers are still available from IBM Product Centers and from several mail-order companies at heavily reduced prices. For example, 47th Street Photo in New York City ((212) 260-4410; [800] 221-7774 outside New York) is selling the PCjr both in the company's retail stores and by mail order. IBM has said that for at least five years, it will meet "all foreseeable hardware and software demand" for the PCjr. IBM's Personally Developed Software line (\$15 and up; for a catalog, call [800] IBM-PCSW; or write to P.O. Box 3280, Wallingford, CT 06494) includes programs for the PCjr; other, more advanced IBM programs, such as the Assistant series, also run on the jr. IBM Product Centers sell all IBM hardware, such as the PCjr internal modem, speech synthesizer, and memory expansion and

JEFFREY BAIRSTOW is a contributing editor for FAMILY COMPUTING.

parallel port attachments.

In addition, much new third-party software on the market is designed for the IBM PC/PCjr. This is especially true of games, education packages, and, to a certain extent, productivity packages. Because new IBM PC software is certain to keep coming, you can expect that much of it will also run on the PCjr. Racore Corp., which makes a disk drive and memory expansion unit for the PCjr, still has units available. They can be ordered through Micro Marketing ([800] 241-6490) in Norcross, Georgia, among other places.

Can you tell me if there is a good graphics printer under \$220 for an Apple II? I would prefer one that prints at 100 characters per second.

CARLOS DEJUANA
McAllen, Texas

You'll have to buy via mail order or from a discounter to get a printer in your price range capable of printing graphics and text at 100 cps. The Epson LX-80, which prints at 100 cps, the Star Micronics SG-10 (120 cps), and the Okidata 182 (120 cps) all list for \$299. However, you'll find them selling for less from mail-order or discount houses. If you order one, be sure to ask for the version—parallel or serial—that matches your printer card. Your software must be configured to work with a specific printer to take full advantage of its graphics capabilities. For more information on printers, read the "Buyer's Guide to Low-Cost Printers" in the September FAMILY COMPUTING.

I have a Commodore 1702 color monitor. When I turn the monitor on and hold the back of my hand to the screen, the hairs on my hand stand out straight. Is this radiation that would be harmful to a person?

WILLIAM E. NOICE
Richfield, Ohio

You're not feeling fallout, just static, which builds up during winter months particularly. The static is

not harmful to you or to your monitor. However, static can play havoc with your computer and your disks. Touch something metal before you approach a computer to discharge the electricity from your body. Be sure to do this before handling plug-in circuit boards on the Apple or the IBM because you can cause severe damage.

Where can I find a memory pack and a color pack for the Timex Sinclair 1000?

TONI MARTINAZZI
Chicago, Illinois

Rather than adding memory and color (which could end up costing you about \$200) to a Timex Sinclair 1000, why don't you consider buying a Timex Sinclair 2068? Several mail-order firms offer them for around \$160, and Zebra Systems Inc. (78-06 Jamaica Ave., Woodhaven, NY 11421; [718] 296-2385) sells them for \$139. The 2068 comes with 48K, 16 colors, and two joystick ports.

If you want the 1000's 16K memory pack only, you can order that from Zebra for \$20.

Are there any bulletin board systems with programs for the ADAM?

JOHN LUNDY
Stuart, Florida

There are several local bulletin board systems with ADAM programs, but probably the biggest selection of ADAM programs (and biggest group of ADAM users) can be found in the Family Computing Forum on CompuServe (GO FAMFORUM) in Data Library 6 (DL 6). A wide range of programs are available, including text adventure games, utilities, graphics, and CP/M. You'll also find a file called BBS that lists ADAM bulletin board phone numbers around the country.

Send your questions to FAMILY COMPUTING, Computing Clinic, 730 Broadway, New York, NY 10003. Due to the volume of mail, we regret that we can neither answer nor publish all questions received.

How much is that doggie in the window?
Did Noah own an umbrella? Is that check
really in the mail?

Find out by asking Racter™
Mindscape's™ new tongue-in-chip
software.

Racter gives your computer a
mind of its own. Imagine the hit that
can be at a party.

Racter answers all your ques-
tions. Gives you advice. And changes
your outlook on all that's sane in the world.



He'll do the same for your friends. And your pets.

What's more, Racter has been half-
heartedly endorsed by the Institute of
Artificial Insanity.

Take Racter home and you'll never
be alone again.

Don't forget to buckle up.

Mindscape 
Software that challenges the mind. MINDSCAPE, INC.

Racter is available for Apple® II Series, Macintosh™,
and IBM® PC. Coming soon on Amiga.*

CIRCLE READER SERVICE 32

*Racter made me
what I am today*



TEAR ALONG THE DOTTED LINE.

Send in
this coupon before
you're sent away.

To join the Institute of Artificial Insanity,
simply take a crayon, fill in this coupon,
and send it along with \$4.37. To save
\$4.37, buy Racter and you're auto-
matically committed.

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Best **2nd** ANNUAL Ever Shopping Guide

FOR
COMPUTER
LOVERS



PHOTOGRAPH BY RICK HARRICK

How do you figure out what products to buy? How do you figure out how to make those products work? Many of the articles and programs in FAMILY COMPUTING address one of those two needs. During this gift-giving season, our focus on products is even stronger than usual, with an all-new edition of last year's popular "The Best-Ever Shopping Guide For Computer Lovers." Stuck for an idea? Peruse "Something For Everyone—Gifts from \$6 to \$600" for the practical or exotic. Confused by the industry's hairpin turns? Read "Best Hardware Picks of '85" for a year-in-review look at major trends. Want a deal? go straight to "Seasonal Specials." Somewhere in this guide, we hope you'll find the right gift at the right price for that hard-to-please special person. And maybe even something for yourself, too.



SOMETHING FOR EVERYONE—GIFTS FROM \$6 TO \$600

BY ROXANE FARMANFARMAIAN

Hark! 'Tis the season for merrymaking, carol-singing, and gift-giving. As Jack Frost nips at your nose, and your list for stocking stuffers grows, bring joy to the season by giving computer presents. Here's a compendium of the best, most ingenious, and most useful gift ideas we could find—ones to elate your family and friends, from hackers to non-computerists. (Note: prices listed are suggested retail. They don't include shipping and handling charges.)

ROXANE FARMANFARMAIAN is managing editor of FAMILY COMPUTING.

PERFECT SETUPS

Furniture that's practical and stylish for 1986!

1 Usher in the new year by giving your family a beautiful roll-top cabinet your computer can call home. The **Home Computer Center** is solid oak, easy to assemble, and will hold all your computer equipment, plus disks and books. \$589.95 from Craftsman's Corner, 4012 N.E. 14th St., Box AP, Des Moines, IA 50302; (800) 247-2160.

2 Give everyone in the family a chance to compute in comfort with Computer Furniture Warehouse's **Adjustable Work Station**. Lower or raise the unit with a hand crank to accommodate both kids and adults. \$137-\$208. Five Central Ave., P.O. Box 127, Dept. 3215, Tarrytown, NY 10591; (800) 431-8808.

3 If space is at a premium, the **Oak Apple Tree** will make your favorite Apple computerist happy indeed. This three-tiered shelf stacks a CPU, two disk drives, and a monitor. \$69.95 from Herrington, Inc., 10535 Chillicothe Road, Kirtland, OH 44094; (216) 256-1446.

4 5 For those who need more room around their com-

puters, the **SpaceSaver 2** from Omnium is a sure bet. The adjustable support arm of chrome and enameled steel raises the monitor above the workspace. \$129. Also from Omnium: the **TouchBase** wrist rest. It's great for reducing arm fatigue at the keyboard (and it even helps control static buildup). \$49.95. P.O. Box 186, Stillwater, MN 55082; (800) 328-0223.

SEASON'S GREETINGS

Send off your traditional best wishes with a hi-tech twist.

6 Keep them guessing with BitCards' **A Christmas Adventure**. This fun text/adventure mystery game sets the recipient tracking down the disappearance of Santa, while simultaneously trying to figure out who sent this truly original gift. Excellent documentation makes it easy to customize before sending it off. For Apple, Commodore; \$24.95. 30 W. Service Road, Champlain, NY 12919; (800) 821-5226.

7 Jazz up your cards and letters by printing them in color! **Rainbow Ribbons** come in a variety of luscious hues for Apple, Coleco, Commodore, Epson, HP, and IBM printers. \$8.50. Princeton Office Sup-

ply, 43-15 Quail Ridge Drive, Plainsboro, NJ 08536; (609) 799-2515.

8 For the prettiest holiday missives ever, **Wizard Computer Accessories** makes micro-perf continuous-feed Christmas stationery. \$10 for 32 sheets of bond paper and 30 colored, single-feed envelopes. 2423 W. Devonshire Ave., Phoenix, AZ 85015; (602) 285-1355.

9 Send a colorful, animated greeting disk, complete with music and a personal message, to friends with a 256K IBM PC. **K-Kards** by Keron Productions; \$10 (add \$5-\$20 for customization). P.O. Box 21010, Columbus Circle Station, New York, NY 10023; (212) 724-7018.

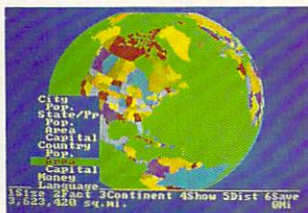
10 Delight friends and family this year with Thoughtware's **JingleDisk**, an animated Christmas story that unfolds with screenfuls of color and six holiday songs. Apple, Commodore, and IBM (and compatible) owners can even print out personalized cards of a selected graphic. \$10. 2699 S. Bayshore Drive, Coconut Grove, FL 33133; (800) THT-WARE.

HI-TECH TO GO

The ultimate traveling companion? A computer, of course.



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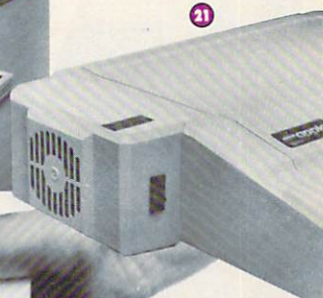
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11 Send travellers on their way with Sharp Electronics Corp.'s snappy **Portable PC-2500**. This 2.9-pound, notebook-size computer comes with built-in printer/plotter, spreadsheet and BASIC software, and a serial port that allows communication with other computers. \$395. 10 Sharp Plaza, Paramus, NJ 07652; (201) 265-5600.

12 Don't leave home without it. **Prairie Power Systems'** portable briefcase for computers neatly packs up, among others, Tandy, NEC, Epson, and Hewlett-Packard lap-tops. There's also a model for the Apple IIc. Battery and carrying system extend the computer's running time five-fold. \$169 (\$249 for Apple IIc). 768 Twelve Oaks Center, 15500 Wayzata Blvd., Wayzata, MN 55391; (612) 475-1793.

13 The perfect gift for the person who has everything? Present the **Disk Organizer**: a chic, leather disk portfolio with a certain cachet! Comes in three colors for either 5 1/4-inch or 3 1/2-inch disks. \$24.95 from KS Universal Co., 292 S. Seneca Circle, Anaheim, CA 92805; (213) 631-1938.

14 Get a spectacular view on the world with Software Concepts' **Atlas**. Draw maps and globes, zoom in close, and find out facts with this versatile,

colorful program. For IBM PC/PCjr. \$70. P.O. Box 3323, Wallingford, CT 06494; (800) 782-4567.

15 Gearing up for a trip across the border? Speak the lingo like a native once there with Gessler Educational Software's adaptation of popular programs such as **The Most Amazing Thing in French, Spanish, or German**. For Apple, Commodore, or IBM PC and compatibles. \$49.95. 900 Broadway, New York, NY 10003; (212) 673-3113.

16 It's the tiniest computer yet. The Seiko **PC Wrist Terminal** packs power on the move. Hook it up to your micro, store files on it, and enjoy the luxury of having your files on your wrist throughout your trip. \$199 from Hattori Corp. of America, 1330 W. Walnut Pkwy., Compton, CA 90220; (213) 603-9550.

TLC COMPUTER-STYLE

Good maintenance will keep your computer humming all year long.

17 Get your local hackers swabbing, rather than squinting, at the dusty screen by starting them on the **Screen-wipe** habit. Fifty handy wipes come in a plastic pouch which attaches easily to the side of the monitor; \$20. Aldine Paper

Co., 315 Park Ave. S., New York, NY 10010; (212) 505-1000.

18 Pamper your computer with **Mini-Vac**, a battery-operated micro vacuum with interchangeable wands and brushes for easy computer cleanup. \$29.95 from The Pine Cone, 7485 Monterey St., Box 1378, Gilroy, CA 95020; (408) 842-7597.

19 It's the thought that counts, so think ahead and ensure a happy future with a Computer Power Solutions surge protector. **Electra Guard System 5** is a six-outlet wall model that will shield your micro from damaging electrical surges. \$49.95. 8800 49th St. N., Suite 203, Pinellas Park, FL 33565; (813) 544-8801.

20 Wrap up a Read/Right **Heads & Screens Cleaning Kit** for the neatnik in your family. A complete packet of cleaning disks, solution, and pads will keep the computer healthy and everyone (including your micro) happy. \$26.95 for 5 1/4-inch disks, \$19.95 for 3 1/2-inch. The Texwipe Co., 650 E. Crescent Ave., P.O. Box 575, Upper Saddle River, NJ 07458; (201) 327-9100.

21 Keep your family's Apple II cool as a cucumber (along with the printer and monitor) with Kensington Microware's **System Saver** fan. Fits snugly onto the side of the

computer, clipping power surges, filtering line noise, and fanning the motherboard; \$89.95. 251 Park Ave. S., New York, NY 10010; (212) 475-5200.

NETWORK WITH THE BEST

For something completely different, give your family (or a special friend) a membership to a computer network this year. You need a computer, phone, and a modem to join. Hourly charges vary depending on the time of day and the day of the week you use the service.

22 23 A gift membership to **CompuServe** or **The Source** is a gift indeed. These national networks offer news, online programs, shopping at home, the chance to swap information with other users, and much more. CompuServe costs \$39.95 to sign up, and from \$6-\$15 an hour; for more information, write to 5000 Arlington Blvd., Columbus, OH 43220; (800) 848-8199. The Source charges \$100 to sign up, a monthly minimum of \$10, and from \$7.75-\$25.75 an hour; 1616 Anderson Road, McLean, VA 22102; (703) 734-7500.

24 Surprise the more research- or financially-oriented members of your family with a membership on **Dow Jones**



News Retrieval. Hook into this gold mine of information for stock price quotes, encyclopedia listings, even online securities trading. \$75 to sign up. \$12-\$54 per hour. P.O. Box 300, Princeton, NJ 08540; (800) 257-5114.

35 Great for the games buff, a gift membership to **PlayNET** offers colorful, on-screen challenges all year long. Only for C 64 owners. \$39.95 to join, \$6 monthly service, \$2 an hour. 200 Jordan Road, Troy, NY 12180; (800) PLAYNET.

36 For the busy Apple or Commodore owners in your midst, a membership to **Viewtron** offers weather, news, online shopping, travel info, and the opportunity to socialize on CB. All this and more in full color. Starter kit: \$9.95, \$5.50-\$13.50 an hour. Viewdata Corp., 1111 Lincoln Road, 7th Floor, Miami Beach, FL 33139; (800) 543-5500, ext. 9401.

37 Though not a network per se, the **Boston Computer Society** offers members access to its weekly electronic magazine via a local phone call, a free account on Western Union's EasyLink mail service, plus an array of mailings, programs, and services oriented to the novice computer fan. Family membership costs \$42

a year. One Center Plaza, Boston, MA 02108; (617) 227-0170.

DISK DELIGHTS

Software for every occasion.

28 Slip a copy of **Golden Oldies Vol. 1** on the software shelf of a game enthusiast, and your name will be praised for many years to come. This glitzy collection of classics boasts the four software greats: *Adventure, Eliza, Life, and Pong*. For Apple, Atari, Commodore, IBM, and Mac; from Software Country/distributed by Electronic Arts; \$29.95-\$34.95. 270 N. Canon Drive, No. 1297, Beverly Hills, CA 90210; (213) 278-8450.

29 Turn your 64K Tandy CoCo into a Macintosh with Colorware's **CoCo Max**. The input module plus software provides icons, windows, pull-down menus, and a variety of fonts and paintbrushes (plus printout option), all in striking hi-res graphics. \$69.95 from Spectrum, P.O. Box 21272, 93-15 86th Drive, Woodhaven, NY 11421; (718) 441-2807.

30 A great gift at a small price, Janus' **Mentor Preview Series** disks feature demos of games, educational programs, data-base managers, word processors, and templates for the same price as

blank disks at retail. Box of 10, \$29.95-\$39.95 for Apple, Commodore, and IBM computers. 1860 Barber Lane, Milpitas, CA 95035; (800) 338-0100.

31 32 Delight a budding software collector with PerfectData's **Dial 'N' File**, a sleek, portable storage box for 10 disks. An ingenious dialer fans out the disks to avoid unnecessary handling. If you're saving family records or important financial data, check out PerfectData's **Polaroid disks**. They come with a 20-year guarantee, and Polaroid has a good track record for retrieving data from damaged disks; \$30-\$36. 9174 Deering Ave., Chatsworth, CA 91311; (800) 225-1384.

33 Add pizzazz to any disk collection with **Kaleidiskettes**. Different colors can be used to distinguish various types of programs and data, e.g., games on green, utilities on red. \$14.95-\$16.95 for 10. Allenbach Industries, 5957 Landau Court, Carlsbad, CA 92008; (619) 438-2258.

ACCESSORY TO THE COMPUTER

Fill up Santa's bag with computer peripherals, great gadgetry, or a gizmo or two.

34 The ideal gift for ADAM owners! **Tractor Feed**

streamlines paper through the SmartWriter printer for perfect printouts every time. \$80. Data Backup, Box 335, Iona, IN 83427; (208) 522-2505.

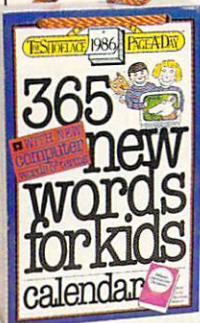
35 With a little help from Bose Corp.'s **RoomMate** speaker system, your micro can sing like a virtuoso. The compact, portable speakers easily plug into a variety of personal computers to produce rich, beautiful sounds. \$229. The Mountain, Framingham, MA 01701; (617) 879-7330.

36 If yours is the type of family that loves to talk on the phone but loves telecomputing, too, Theall Engineering Co.'s **Smart Modem-phone** lets you do it all (though not all at once). It's 1200 baud and Hayes-compatible, comes with auto-dial and auto-answer, and has a built-in telephone for voice communications and a clock to monitor the length of your call. \$290. P.O. Box 167, Oxford, PA 19363; (215) 932-3488.

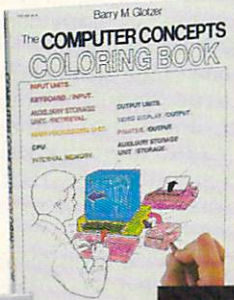
37 Amaze your friends and relatives with Sonitree Inc.'s **Space Pen**. A 3-D input device that's compatible with touch tablet and joystick software, it looks right for the space age and acts like it, too. For Apple, Atari, Commodore, and IBM computers. \$150-\$175. 480 Vandell Way, Campbell, CA 95008; (408) 866-4616.



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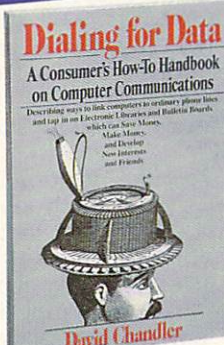
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30 Go easy on the eyes with the **CP-50 Circular Polarizing Filter**, a state-of-the-art filter for all major computer brands. It reduces screen glare, eyestrain, and fatigue. \$49.95, PerfectData Corp., 9174 Deering Ave., Chatsworth, CA 91311; (800) 225-1384.

39 40 A gift of music will delight the angels in your house. Plug in a **MIDI Magic** interface to your C 64/128 or Apple IIc for easy hookup with a variety of keyboards and amplifiers. When you tire of playing your own tunes, slip a **QRS Player Piano Roll** disk into your drive and listen to the keyboard play classic songs, just like the player pianos in the old days. MIDI Magic comes with a six-song QRS demo. Micro W Interface: \$49.95. QRS Music Disks (six songs on each): \$19.95. 1026 Niagara St., Buffalo, NY 14213; (201) 838-5606.

41 42 For those who want more than a mouse, Koala Technologies' **Kat** combines all the advantages of the Koala Pad and mouse into one great pad. \$235. Also from Koala is **MacVision**, a great gizmo to transfer picture frames from your VCR to the computer, and onto your printer for a printout. \$299. 2065 Junction Ave., San Jose, CA 95131; (800) KOA-BEAR.

MICRO MISCELLANY

43 Gather the vacationing family round for an exciting game of **Computerize!** Before the day is done, this colorful board game will have even the most adamant "computer-phobe" discoursing on disk access and file transfers. \$20 from Kaysibs Ltd., 12100 W. 35th Ave., WheatRidge, CO 80033; (303) 237-2998.

44 Sit back and relax to the extraordinary sounds of **Christopher Light: One-Man Band**, an album of folk songs performed on an Apple computer plus synthesizer. \$8.95 from Kicking Mule Records, Inc., P.O. Box 158, Alderpoint, CA 95411; (707) 926-5312.

45 Be remembered every day in 1986 by tucking a **365 New Words for Kids** calendar into the stocking of a favorite niece or nephew. Over 50 computer words (and others, too) in this page-a-day calendar from Workman Publishing Co., \$6.95. 1 W. 39th St., New York, NY 10018; (212) 398-9160.

46 Got friends about to take the plunge into telecommunications? Hand them a copy of **Dialing for Data**. This amusing, informative, and well-illustrated book by David

teach even the most micro-savvy friend a thing or two. \$9.95 from Random House, 201 E. 50th St., New York, NY 10022; (212) 572-2296.

47 Break out the felt-tip pens and try a fun new method of learning. **Computer Concepts Coloring Book** is not just for kids, since some of the ideas are rather sophisticated. Ideal for the whole family to work on together. By Barry Glotzer; \$8.95 from Harper & Row, 10 E. 53rd St., New York, NY 10028; (212) 207-7000.

48 Know someone in the doldrums over incomprehensible documentation? **CompuTutor** could be the answer. This series of videotapes enlists the VCR to explain how to use your machine. **VisiCalc**, **Lotus 1-2-3**, and a slew of other popular programs. Perfect tutorials for Apple, IBM PC, and Tandy Model 4 owners. \$69.95 per tutorial from TeleMedia Concepts, Inc., 1311 Colorado Ave., Santa Monica, CA 90404; (800) 528-2554.

49 Show your good taste by giving an **IDM** (Incredibly Delicious Machine) to the light of your life. Read up on enjoyment do's and don'ts in the Technical Reference Manual before "byting" into the gourmet-chocolate disks housed in their own cardboard micro. \$10. 16 Seminary Ave., Hope-

well, N.J. 08525; (609) 466-9187.

50 The kids will flip over **Movits**, feisty little robots you can build from a kit. There are nine different models; all are battery-operated, some are programmable, and one even interfaces with your Apple or C 64. Educational Robot Kits from OWI Inc., \$20-\$75. 1160 Mahalo Place, Compton, CA 90220; (213) 638-4732.

51 Step into the future with **Hearoid**, the friendly, 18-inch robot. He can be programmed to respond to your voice, has a built-in cassette deck, flashing headlight eyes, and can do useful chores around the house. \$400 from TTC, 2009 E. 222 St., Carson, CA 90810; (213) 834-8825.

52 Enchant your resident computer nut with a **Programmable mug**. Fill it with hot chocolate, coffee, or soup, and the mug will let everyone know it's break time. \$9 from Sweet Gum, Inc., 15490 N.W. 7th Ave., Miami, FL 33169; (305) 687-9338.

53 Cook up a storm with **Chocolate Byte**, a recipe program filled with chocolate delights. Best of all, it comes bundled with a huge chocolate disk. For IBM PC/PCjr; \$30; from The Software Toolworks, 15233 Ventura Blvd., Suite 118, Sherman Oaks, CA 91403; (818) 986-4885. **FC**

Best Hardware Picks of '85

**THE YEAR IN REVIEW:
NEW COMPUTERS,
DISK DRIVES, MONITORS,
AND PRINTERS** BY NICK SULLIVAN

Look beyond all the ups and downs of various manufacturers and their particular products, and you'll see that the general direction in each major hardware category is clearly toward products that are more practical and cheaper. In each category, some products are a step or two ahead of the rest; these leaders point to where the crowd is headed.

We've tried to pinpoint the prevalent trends and the products that best illustrate them. In picking these pacesetters, we've considered value (price/performance), reliability, ease of use, variety of applications, etc.; not necessarily the gee-whiz pyrotechnics of the latest-and-greatest. In any category, products not mentioned are likely to incorporate many of the same award-winning features as the best picks. Keep this in mind when shopping and trying to match your wallet to your dreams.

COMPUTERS

In 1985, three major computer trends emerged that will probably continue for some time:

- First, two manufacturers (Leading Edge and Tandy) introduced IBM PC "work-alike" computers loaded with extras and priced for consumers (as opposed to business-people). These computers run most IBM software.

- Second, two manufacturers (Atari and Commodore) marketed computers that work much like Apple's Macintosh, but add color and other features. One key drawback to these models is that they use new operating systems and run no Macintosh software.

- Several manufacturers also beefed up their old computers with more power and memory. Apple started this trend in 1984 with the 128K Apple IIc. In 1985, Atari followed suit with its 130XE, Apple brought out a whole line of new products for its II line, and Commodore introduced the potentially powerful **Commodore 128**, which runs a large amount of CPM business software.

The Tandy 1000 and the Leading Edge Model D are the

two IBM work-alikes that bring professional computing power into the price range of many consumers.

The **Tandy 1000** has a relatively low entry-level price (\$999), as well as good color and three-voice sound capability, making it a true "family" computer—suitable for business, education, and entertainment. The entry-level model comes with 128K, one disk drive, and a parallel printer port, but no monitor. The 1000, however, can be used with a television. Also built in are a speaker and joystick, RGB, and light-pen ports.

You can buy the 1000 with an internal hard disk drive; an external one can be added later. The Tandy 1000 runs most, but not all, IBM software, including *Lotus 1-2-3*, the *PFS* series, and *Multiplan*. In addition, *DeskMate*, an integrated word processing/communications/spreadsheet/filing program that Tandy ordinarily sells for \$199, is included with purchase. No wonder Tandy is calling the 1000 its "most popular computer ever."

The **Leading Edge Model D** is a good bet for purely professional use. The keyboard is very sturdy, each key-stroke ends with a satisfying click, and the monochrome display is quite sharp. The Model D, which costs \$1,495 and runs virtually all IBM software, gives you a system that would cost over \$3,000 in an IBM Product Center. It comes with 256K, two disk drives, parallel and serial ports, monochrome and RGB color monitor ports, and a one-year warranty. A switch on the back lets you set the computer for monochrome or color.

Even with all this built-in equipment, you still have four empty slots for add-on boards. Plus, the Model D accepts all IBM plug-in boards (the Tandy doesn't). The Model D is capable of doing graphics (such as the bar charts in *Lotus 1-2-3*) in monochrome, whereas on the IBM PC, you need a \$200–\$500 color graphics board installed. The Model D, which is compact and attractive on a desk, is a stunningly good value.

The **Amiga** follows in the footsteps of the Macintosh, but actually goes a few steps further. It does some things that no other microcomputer on the market can do, and thus is one of the most significant products of the year. Whether or not it's one of the best products of the year (in terms of price/performance, support, reliability, etc.) is open to interpretation: it's a new computer still in search of dealers, users, software, and a track record.

The Amiga, like the Macintosh, is mouse-operated,



★ Leading Edge Model D

★ Tandy 1000

★ Amiga

★ Atari 520ST

★ Commodore 1571

★ Apple Unidisk 3.5

★ Tandy 10-Meg. Disk System

★ Apple ColorMonitor

though the cursor-control keys can be used instead if you prefer. Because the Amiga has custom chips for graphics and sound, these two aspects of the computer are outstanding. What is most impressive is that the Amiga can run several programs at one time. You can be downloading a program from another computer, printing out a file from your word processor, recalculating a spreadsheet, and playing a game—all at the same time. This may seem like overkill, but serious computer users will take advantage of the feature over and over again. The Amiga, which sells for \$1,295 (256K, one disk drive), can be used with a television or composite color monitor, but is designed to be used with its 1080 RGB monitor (\$495).

The **Atari 520ST**—also in search of dealers, software, and a track record—is a significant product because of its price: \$799 with a monochrome monitor; \$999 with an RGB monitor. The ST comes with an external disk drive and has a sizable 512K memory, though half of that is taken up when the TOS operating system is loaded. In addition, the inclusion of a MIDI interface to connect musical devices, and a hard-disk drive interface mean that the system is geared for expansion.

DISK DRIVES

According to a recent FAMILY COMPUTING market study, 68 percent of our readers own disk drives. That's a 35 percent increase over 1984 (an indication of the way the wind's blowing in data storage). Besides moving from cassettes to disks, users are also looking for second disk drives, and even hard disk drives. Fortunately, as users' needs have increased, technology has improved. First, more and more manufacturers are bringing out 3.5-inch disk drives, which use smaller and more reliable disks than the 5.25-inch drives. Two new computers introduced this year, the Atari 520ST and the Amiga, use 3.5-inch disk drives. (The Macintosh, which came out in 1984, was the first major computer to use a built-in 3.5-inch drive.)

Second, more and more manufacturers are increasing the storage capacity of their disk drives. The **IBM PC AT** disk drives store 1.2 megabytes (705 double-spaced pages), and the **Amiga** disk drives store 880K (517 pages)! And the **Commodore 1571** disk drive for the C 128 stores up to 410K (241 pages). (The 1571 is also an "intelligent" drive that can read C 64 and C 128 disks, and a wide range of CP/M disks from different machines.) Compare this to 140K (about 82 pages) for an Apple II drive, 170K (100 pages) for a Commodore 64, 184K (108 pages) for a Tandy Model 4, and 360K (211 pages) for an IBM PC.

More significant than any of these drives—because of the number of Apple II owners—is the new **Unidisk 3.5** disk drive for the Apple IIe (\$570) and IIc (\$500). The Unidisk 3.5 drive stores about 800K of data and can be used in conjunction with the existing Apple II 5.25-inch drive. You can use the old drive to run your program and the new drive to store data. Or, if you have the Apple Memory Expansion Card and use several programs fre-

quently, you can store them all on the Unidisk and switch between them without turning the computer off or losing files. The software that allows you to switch between two or more programs (word processing and communications, for instance) is Quark's *Catalyst 3.0*, which is sold with the disk drive. *Catalyst* is designed to be used with a mouse, and makes the IIe or IIc function like a Macintosh.

Finally, in 1985 more computer manufacturers offered hard disk-options, and prices dropped precipitously on external hard disk drives. In 1985, this advanced data-storage device really began to emerge as a viable product, especially for people who use their computers primarily for data-intensive businesses. The most common hard disk drives store 10 or 20 megabytes of data (one megabyte is equal to 1,000K), or the equivalent of about 6,000 to 12,000 double-spaced pages. The **Tandy 1000** and **Leading Edge Model D** can be bought with built-in hard disk drives, and the **Atari 520ST** has a built-in hard-disk drive interface, worth about \$200 on most computers. Tandy sells an external 10-megabyte drive for \$699, and the well-respected 10-megabyte **The Sider** (First Class Peripherals) drive for the Apple II costs only \$695. Not so long ago, 10-megabyte drives cost \$2,000.

MONITORS

Most computer users have to switch between a monochrome and a color monitor when they alternate between a word processing program and a game. Television has no such limitations. You can watch a black-and-white Bogart movie or the Orange Bowl in full color on the same tube.

Yes, I know: **RGB color monitors** have very sharp color displays, and are fine for programs requiring 80-column text (though not quite as sharp as monochrome monitors). Thus, users can switch between *Wordstar* and *Flight Simulator* without switching monitors. The problem is, RGB monitors are expensive and—until recently—worked primarily with Apple II or IBM PC computers, both of which require expensive RGB interface cards. (On the IBM PCjr, the RGB interface is standard equipment.)

In one of the most exciting product trends this past year, all new computers came with built-in RGB interfaces. This included the Commodore 128 and Amiga, Atari 520ST, Tandy 1000, and Leading Edge Model D. Of course, manufacturers of these models also sell RGB monitors to go with their computers. Any way you look at it, this new design feature gives the RGB advantage to more people and essentially cuts the price of the option in half.

A real trend-setter in monitor design is the brand-new **Apple ColorMonitor**. Apple seems to have an endless bag of tricks to keep its II line performing, and this monitor is one of the better ones. The ColorMonitor IIe and IIc (\$399), which come in two different casings to complement the IIe and IIc, aren't RGB monitors. The colors aren't quite as sharp as those on an RGB monitor. The ColorMonitor is a regular color monitor that plugs right in without a special interface—yet it can display 80 columns of text! That makes it a first in the industry. →

The Apple ColorMonitor and the new computers with RGB output that allow you to use one monitor for two radically different displays represent a major improvement in computer design. Eventually, it will benefit users who want to use both color- and text-oriented software. And several manufacturers, such as **Sakata, Sony, and Thomson**, now make monitors that work both as RGB and regular color monitors, and thus can be used with two types of computers.

PRINTERS

The past year was characterized by two major trends: 1. color printers came into their own; and 2. printers in general became more versatile and easier to use. A third trend, more important to competing manufacturers than consumers, is that IBM became a major player in the printer market. In fact, IBM came out with both a color printer (Jetprinter) and one of the "new generation" dot-matrix printers (Proprinter), among others.

Until last year, color printers were about as accessible to the general public as a mansion in Newport. But the **Apple Scribe** for the IIc and Macintosh (\$299), and the **Okimate 10** and **20**, low-priced (about \$250) color models (with Plug 'n Print cables for the Atari 800XL/130XE, Commodore 64/128, Apple II, Macintosh, and IBM PC) made color printouts less expensive than letter-quality ones! All these models can print on acetate transparencies, for those who make presentations with overhead projectors. On top of this, the Apple Scribe and Oki 20 offer pretty good "near-letter-quality" type. The drawbacks to these color printers are that they are slow for straight text printing and require frequent ribbon changes.

Further up in the price spectrum are fast dot-matrix color printers that use the same ribbon over and over again. The **Epson JX-80** (\$799), **C. Itoh 8510SCP + NLQ** (\$895), and **Apple ImageWriter II** (\$595) are all fast and versatile dot-matrix printers that can also print in color. Finally, **IBM's Jetprinter** (\$745), an ink-jet model introduced this year, legitimizes color printing to the extent that software developers will probably begin writing IBM business programs that can print out in color.

1985 BUYER'S GUIDES

Here's a listing of the products we've reviewed over the past year:

| | |
|--|------------------------------------|
| JANUARY—Joysticks | JULY—Custom Components |
| FEBRUARY—Graphics Tablets and Light Pens | AUGUST—Music Hardware/Software |
| MARCH—Modems and Communications Software | SEPTEMBER—Low-Cost Printers |
| APRIL—Color Printers | OCTOBER—Business-Related Hardware |
| MAY—Portable Computers | NOVEMBER—General-Purpose Computers |
| JUNE—Computers | DECEMBER—Joysticks (K-POWER) |

1985 COMPUTER REVIEWS/PREVIEW

| | |
|--------------------|---------------------|
| MAY—IBM PCjr | SEPTEMBER—Macintosh |
| JULY—Commodore 128 | OCTOBER—Atari 520ST |
| AUGUST—Atari 130XE | NOVEMBER—Amiga |

As alluring as color printers sound, precious little software has been written to work with them. Don't assume that a particular program prints in color; check first. Also, keep in mind that any program that can be custom-configured to work with your printer (such as *AppleWorks*, *Lotus 1-2-3*, and many word processing programs) can be set up to work with a color printer.

Equally large strides have been taken in the one-color, dot-matrix printer field. In the past, many dot-matrix printers produced that "dotty" look that many people have come to dislike, and were extremely difficult to operate. Now, a near-letter-quality mode that comes very close to the print quality of letter-quality printers answers the "dotty" rap. Superior paper-feed mechanisms and push-button controls on the front of printers allow you to switch between draft, correspondence, and near-letter-quality modes (so you don't have to struggle with the software or hidden DIP switches inside the printer). The result? High-performance printers that you can control!

Three printers in particular stand out from the rest of the 1985 field: **Apple ImageWriter II** (\$595), **IBM Proprinter** (\$550), and **Okidata ML192** (\$499). All three are fast, offer near-letter-quality or correspondence modes that are fine for most business letters, feature relatively easy paper-feed mechanisms, and can print single sheets or perforated "continuous-form" computer paper with equal aplomb.

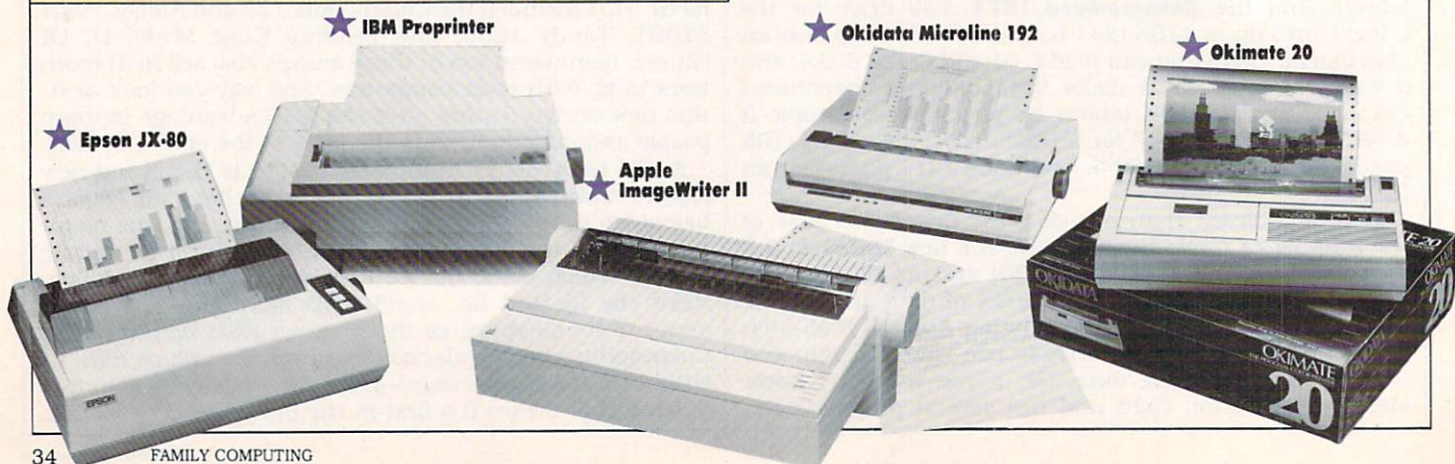
Other features ice the cake: The ImageWriter II tilts up in the back, so you can store paper underneath; the IBM Proprinter has a front-feed slot, so that you can slide in a single sheet or an envelope while you have perforated computer paper installed; the compact Oki ML192 has both rear- and bottom-feed capability, so you can choose the best paper-storage method.

COMING SOON

In 1985, there were no real stunning technological breakthroughs—at least none that reached the consumer market. (The Amiga's "multitasking" capability is an exception to this general rule.) Rather, products were refined—made smaller, faster, easier to use, and more powerful. All these advances benefitted a computing populace that needed desperately to catch its breath after the rapid change of the past few years.

In 1986, however, brace yourself for more quantum leaps in technology. For instance, this year Grolier Electronic Publishing put one of its encyclopedias on a compact disk. But finding a compact-disk drive to run this fabulous software has been impossible, or expensive. Next year, look for compact disk drives to hit the market, watch for prices to plummet, and then wait for some software that will blow your socks off. Or, stick with the time-tested, much-loved system in which you've invested time and money—and master it.

NICK SULLIVAN is senior editor at FAMILY COMPUTING.





★ Atari 800XL



★ Commodore 1702



★ Tandy Model 100



★ KoalaPad Touch Tablet



★ Volkmodem



★ IBM PCjr

GOOD DEALS

If you don't care about owning the newest thing, you can find some great deals on computer equipment. Some of the low prices are set by manufacturers and passed on to certified dealers as newer products enter the market. In other cases, discount and department stores or mail-order houses that have large inventories slash prices.

Here's a short list of time-tested products that can be good deals if they meet your needs:

Anchor Automation's Volkmodem. Do you think computer communication is difficult and expensive? Look at the Volkmodem 300. It's sold with a special cable for your computer, so the hookup's a breeze; it's bereft of dials and lights, so you can't get confused; and it costs well under \$100. The only other item you need to make contact with other computers is communications software. Then, just pick up your phone, dial a number, and when you hear the high-pitched computer tone, flick a switch on the Volkmodem from VOICE to DATA. Voilà! You're online!

Atari 800XL. If you can find an 800XL, you'll probably find it for well under \$100. It's a lot of computer for that price. The 800XL has a cartridge port and can be hooked up to a television. Thus, even without a monitor or disk drive, the 800XL constitutes a good gaming and/or education computer, especially for young kids.

Commodore 1702 Monitor. This product, selling in department stores and through mail-order houses for about \$150, has gained a reputation as the best composite color monitor around, at least in its price range. It connects easily to any computer with standard audio and video jacks (Apple, Atari, Commodore, etc.), and has a built-in speaker. The 1702 is the lowest-priced color monitor that accepts separate inputs for the chroma and luma parts of the color signal; this accounts for the monitor's sharpness.

IBM PCjr. Down but not yet out, the PCjr has had one of the most checkered careers a computer could expect. While no longer in production, the PCjr with its new key-

board deserves a second look. IBM Product Centers are selling the PCjr for about \$700 (and maybe less) with 128K and one disk drive. Some dealers throw in the RGB monitor for peanuts. If you're looking for a low-cost IBM workstation, look elsewhere. But, if you're looking for a good computer for gaming and education, the PCjr has tons of software and great color and sound output (much better than the Apple II's), and can be used with a television. Furthermore, IBM promises to support it with hardware and software for at least five years.

Koala's KoalaPad. When this touch—or drawing—tablet was first introduced in 1983, computer users approached it with wonder. The KoalaPad, which connects to many computers and comes with drawing software, allows you to paint with a stylus and see your work on the screen. It's a much more natural drawing method than light pens or cursor keys. Some mail-order houses now sell Commodore and Atari models for about \$30, though Apple and IBM models may cost about \$75, making them less alluring. The George Booth cartoons that run periodically in this magazine are created with a KoalaPad connected to a Commodore, and then printed out on an Okimate 10 printer.

Tandy Model 100. This lap-top portable with a built-in 300 baud modem sells for \$399 in Radio Shack stores. The Model 100 has standard parallel and serial ports to connect various printers and comes with 8K RAM, which can be expanded to 32K. This is a much larger memory space than first appears because the built-in word-processing, communications, and address programs are on a ROM chip and don't siphon away user memory. The keyboard is superb and the software is a breeze to learn and use. Two potential drawbacks: The screen display is only eight lines by 40 characters, and print-formatting features are virtually nonexistent. But, if you think of the Model 100 as a modem with a computer attached, and as primarily suited for people who write and/or telecommunicate, you won't find a better deal. ☐

Rebates
Free Software

Seasonal Specials

Prizes
Sweepstakes

BY KAREN KANE

Manufacturers get into the holiday spirit with great deals on software and exciting sweepstakes with prizes ranging from an Amiga computer to ski trips to flying lessons!

| COMPANY | PURCHASE REQUIRED | OFFER/VALUE | OFFER EXPIRES |
|--|--|--|----------------------------|
| Access Software, Inc. 2561 S. 1560 W. Salt Lake City, UT 84087 (801) 298-9077 | <i>Neutral Zone, Spritemaster, Scrolls of Abadon, or Master Composer</i> | Reduced to \$9.95 from \$34.95. | 1/1/86 |
| Avalon Hill Game Co. 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 | Two game titles from list of 50 newer releases (e.g. <i>Beast War, Incunabula</i>) | Get one free from long list of older titles (e.g. <i>Telengard, Legionnaire</i>). For full list of software included, consult your local dealer. \$16-\$35 value. | When supplies are depleted |
| Batteries Included, Inc. 30 Mural St. Richmond Hill Ontario, Canada L4B 1B5 (416) 881-9941 | <i>PaperClip</i> for C 64. | Reduced to \$59.95 from \$89.95. | 2/28/86 |
| | <i>B/Graph</i> for Apple or Atari | Reduced to \$39.95 from \$69.95. | |
| | Any of <i>Home Organizer Series: Audio Video Catalog; Electronic Address Book; Home Inventory; Stamps; Checkbook; Mail Lists; Recipes; or Photographs, Slides, and Home Movies</i> | Reduced to \$19.95 from \$29.95. | 2/28/86 |
| | <i>HomePak</i> | Free membership and sign-on to Delphi and CompuServe. \$45 value (\$30 for Delphi and \$15 for CompuServe). | 2/28/86 |
| | | Reduced FAMILY COMPUTING subscription (9 issues for \$8.97), and a free copy of <i>The Dictionary of Computer Terms Made Simple</i> . | 2/28/86 |
| CBS Software One Fawcett Place Greenwich, CT 06836 (203) 622-2525 | <i>Mastering the SAT, Mastering the ACT, Success With Math, or Success With Algebra</i> | Certificate enclosed for \$10 rebate on: <i>Dinosaur Dig, America Coast-to-Coast, The Sea Voyagers, or The Body in Focus</i> . | 6/30/86 |
| CBS Software with Dennison Computer Supplies, Inc. (203) 622-2500 | Any specially marked box of Elephant Memory Disks | Coupons enclosed for \$3-\$5 rebate on: <i>The Sea Voyagers, America Coast-to-Coast, Dinosaur Dig, Dream House, Astro-Grover, Webster: The Word Game, and The Railroad Works</i> . | 1/31/86 |
| Eastman Kodak Co. 343 State St. Rochester, NY 14650 (716) 724-4000 | Any 10 Kodak disks | Coupon booklet enclosed for \$4-\$50 rebates on selected software from Barrons, Broderbund, CompuServe, Davidson and Associates, Innovative Software, MECA, Multimate, Random House, Scarborough, Scholastic, Sierra On-Line, Simon & Schuster, subLOGIC, and Thoughtware. | 1/31/86 |
| Epyx Computer Software, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 | <i>Temple of Apshai Trilogy</i> | Entry blanks enclosed for Sweepstakes: 1st prize—Amiga computer; 2nd prize—library of Epyx games, three winners; 3rd prize—three free Epyx games, 10 winners. | 12/31/85 |
| | <i>Winter Games, Summer Games, Summer Games II</i> | Entry blanks enclosed for Ski Week Sweepstakes: 1st prize—ski week for four at Lake Tahoe (includes transportation, accommodations, lift tickets, ski rentals, car rental, and \$500 spending money). 2nd prize—pair of skis and poles, Saloman bindings and boots, two winners. 3rd prize—ski boots, three winners. | 12/31/85 |
| Epyx, Inc./Lucasfilm Ltd. | <i>Ballblazer, Rescue on Fractalus!, Koronis Rift, The Eidolon</i> | Entry blanks enclosed for National Sweepstakes: Win a 3-day trip for two to San Francisco. Trip includes air transportation, deluxe hotel room on Fisherman's Wharf, tour of San Francisco, tour of Lucasfilm, Epyx jacket, dinner, and \$100 for expenses. 5 winners. | 12/31/85 |
| MicroProse Simulation Software, Inc. 120 Lakefront Drive Hunt Valley, MD 21030 (301) 667-1151 with Cessna Aircraft Co. | <i>F-15 Strike Eagle, Solo Flight, Kennedy Approach, AcroJet</i> | Entry blanks enclosed for Great American Learn to Fly a Real Airplane Contest: 1st prize—complete Cessna Flight Plan to qualify for pilot's license (\$2,990 value); 2nd prize—introductory Flight Training Package (\$1,200 worth of instruction time), 3 winners; 3rd prize—Discovery Flight (\$50 value), 20 winners. | 1/31/86 |
| Paperback Software 2612 Eighth St. Berkeley, CA 94710 (415) 644-2116 | <i>Draw It, Paperback Speller, Paperback Writer, Number Works, My ABC's, VP-Planner, Executive Writer, or Executive Filer</i> | Buy two, get one free (VP-Planner, Executive Writer, and Executive Filer cannot be picked as free package). \$19.95-\$39.95 value. | 1/31/86 |
| | <i>Your Personal Net Worth</i> | Free six-issue subscription to <i>Money</i> or <i>Fortune</i> magazine. \$15 or \$12 value. | 1/31/86 |
| Scarborough Systems, Inc. 55 S. Broadway Tarrytown, NY 10591 (914) 332-4545 | Any Epson printer | Get one Scarborough software package free. Value \$39.95 and up. | 1/31/86 |
| | <i>Mothership</i> | Buy <i>Mothership</i> at reduced price (\$19.95 from \$24.95) and get <i>Dancing Feats</i> (retail value \$29.95) free. | 12/31/85 |
| Spinnaker Software 1 Kendall Square Cambridge, MA 02139 (617) 494-1200 | Any title from: Spinnaker, Fisher-Price, Windham Classics, Telarium, or Better Working Series | The Family Software Spectacular: Buy 3, get 1 free. \$19.95-\$59.95 value. Year-long special! | 1/31/87 |
| Tri Micro P.O. Box 11300 Santa Ana, CA 92711 (714) 832-6719 | <i>Team Mate</i> | Get 1 title free from French Vanilla series (\$6-\$10 value). | 1/15/86 |
| | Any Tri Micro title | Coupons enclosed for 10-20 percent savings on software, disks, and accessories. | 1/15/86 |

Note: For hardware requirements, please consult your local dealer.

KAREN KANE is a copy and research assistant at FAMILY COMPUTING.

GATHER
ROUND THE
WARM
LIGHT OF
THE MONITOR
WITH
GAMES
EVERYONE
CAN
PLAY



ILLUSTRATION BY CURT DOTY

Group Games for the Holidays

BY JAMES DELSON

Among all the spirits of the season, sharing may best reflect the true meaning of the holidays. And how better in a computerized home can family and friends come together to share a common experience than in playing games? Here you'll find activities to engage almost everyone. So fill your cup with festive times and playful moments shared around the computer's cathode ray tube.

FOR GENERAL INTEREST: THE TRIVIAL APPROACH

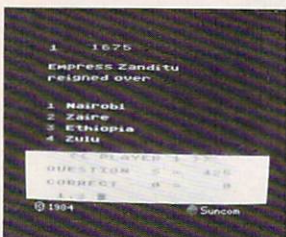
The flood of trivia games released in the past few years has been heavily influenced by one of the phenomena of the '80s—the Trivial

Pursuit game. Along with the increased interest in trivia board games, television quiz shows have become popular again. One reason is that trivia games act as a kind of generic quiz situation for displaying one's intellectual prowess.

Trivia's biggest plus, and the reason why it's ideal for the holiday season, is that it works well as a party game. It's easy to learn, can be enjoyed by gamers of all levels, and is a great icebreaker.

More than a dozen trivia games are available for computers. Which should you choose? I'd look for programs with extra question disks available, since most games repeat questions after a few hours. And programs with a play system, rather than a simple question-and-an-

JAMES DELSON is FAMILY COMPUTING's *games critic*.



(Top) The Shattered Alliance, (middle) PQ The Party Quiz Game, and (bottom) Countdown to Shutdown.

swer format, make for more fun for most folks.

Of all the trivia games my playtesters and I have tried, *PQ The Party Quiz Game* is our choice as a real must. Up to four players use the four enclosed game controllers to simultaneously signal their answers to each of the game's timed, true-false and multiple-choice questions. Whoever answers correctly first scores more points. Bonus rounds without game controllers have also been added to help equalize play for smart players with slow thumbs, and there's a fair handicapping system as well. *PQ* is challenging, and the closest approximation around of being on the old "College Bowl."

TACTICAL PLANNING ON A GROUP SCALE

A number of strategy and tactics games are better played in groups than by individuals. One of the best, *The Shattered Alliance*, is great for holiday gatherings. Playable by gamers with varying levels of expertise, it's highly enjoyable, and has a flexible play system.

In general, war games demand that players use historic armies fighting on predetermined terrain to resolve historically accurate battle scenarios. However, in *The Shattered Alliance* you can recreate realistic situations or go as far afield as you desire in creating original battles or even complete campaigns. You're given a choice of 14 historic and fantasy armies and an infinite variety of others for the Apple version with a separately purchased utility program, *The Shattered Alliance Tool Kit*. That disk adds flexibility by letting you design whole armies, terrain maps, and campaigns from scratch.

Players manipulate six true-life armies, including the forces of Alexander the Great, Xerxes of Persia, Hannibal of Carthage, the Mongol hordes of Genghis Khan, Rome's famed Legionnaires, and the berserk Vikings. Eight additional armies seem like imaginative figments from books by J.R.R. Tolkien or other fantasy writers. Centaurs, elves, unicorns, and other more outrageous creatures comprise the troops. These forces can be pitted against each other or the real armies. Elements such as magic may be added to make the battles more fascinating for fantasy fans.

With fast-moving play of short duration, the game works well in groups. Each game lasts between 15 and 45 minutes, depending on the speed at which orders are issued to the troops. Strategic movement (the big picture for the whole war game) can be supplemented by tactical movement and combat (close-up battles), an ideal way for beginners to learn the game. Advanced gamers will also find a challenge in *Alliance's* fast-paced action. I highly recommend this game for ages 12 and up.

BE A SPORT

If trivia and tactics aren't your cup of Christmas cheer, consider a good sports simu-

lation. This year's best, *On-Field Football*, scored extra points with our playtesters. In *Football*, one to two players use joysticks to control fully animated four-man teams. The players can send them out against each other or the computer in a wide variety of passing, running, and kicking plays, with full control of the ball at every phase.

On each down you have 30 seconds to decide on a play and put it in motion. You should determine your offensive action while the defense makes its plans. Hike the ball to the quarterback, then you can hand off to a running back, or fake a kick, punt away short or long, attempt a field goal, or lateral the ball in the backfield. If you choose a pass play, your digital quarterback can throw to the original receiver, fling an option pass to someone else who's open, or even take the ball himself, running a bootleg. Other on-screen players can receive passes and run with them, intercept and run back the other team's passes, tackle the opposition, kick off, return a kickoff, recover fumbles, make touchbacks, or score field goals, extra points, and safeties.

It will take several hours of trial-and-error with the documentation before you can go "off book" and call your own plays without the manual. *On-Field Football* is state-of-the-art sports gaming, a great demonstration of the computer's power, and a winner for groups. Different players can use teamwork to determine strategy, with one calling offensive plays, another defensive, and a third called in for the kicking game. Don't be surprised if, come New Year's Day, some gamers choose to stay at the monitor rather than watch the bowl games on television!

HIGH ADVENTURE AWAITS!

Adventure gaming is probably the most traditional group computer activity, so it seems fitting to include a superior text adventure for the season's fare. I've chosen *Infidel* because it's not as tough as many, it's more imaginative than most, and made us feel as though we had lived through an *Indiana Jones*-style adventure when we were done.

You begin alone in the middle of a desert, surrounded by sand, more sand, and near a forbidding stretch of the Nile. Where's the rest of the archeological team that's supposed to be accompanying you on this dig, anyway? Gone! But you're a game sort. Brave. Astute. Daring. Even, shall we say, a little foolhardy. You say you want to find the fabulous lost pyramid? And you're not the least bit afraid of going off alone into the vast uncharted desert? Well, saddle up, Pilgrim, and enter the world of *Infidel*, a tantalizing, deadly quest for buried treasure.

Like other text adventures, *Infidel* contains a harrowing series of puzzle-solving situations, death-dealing dangers, and clever, but frustrating, cul-de-sacs. You can expect to meet your maker several times as you explore your

base camp, search for sustenance, and scour the desert for an entrance to the lost tomb. And that's just the beginning!

You'd do well to read up on pyramids because even the best text adventurers can't hope to survive the dangers within the tomb in one go. Don't let this scare you, however. The play-testers and I found this a most accessible text adventure, especially once we realized we had to use a save disk to "immortalize" our location every thirty moves or so. That's because we needed to go back a few steps after we discovered we'd forgotten items that should've been brought along.

"LADIES AND GENTLEMEN OF THE JURY . . ."

Most computer games rely on constant player interaction with the machine. *Jury Trial II* takes a step away from that precedent, reverting to more of a board game approach in which players interact with each other and use the computer as a fair arbitrator of fact—the "judge" and "jury"—in a criminal trial simulation. This makes excellent party-gaming material. With family and friends gathered around the screen, your holiday will be hopping.

In *Jury Trial II*, two gamers take on the roles of defense and prosecuting attorneys in a variety of criminal cases, with more than a dozen other players acting as witnesses to the crimes. The computer randomly generates seemingly endless cases for trial from its data base. Facts and clues related to each crime are offered to lawyers and witnesses for later recall by the computer "sheriff," and then the trial begins.

Both attorneys question witnesses, sug-

gest guilt and innocence to the computer-run jury (whose pretrial selection process is hilarious), and constantly monitor the jury's mood. When all the evidence and testimony have been presented, the jury reaches a decision.

A fast-moving game with wonderful group interaction at all stages, *Jury Trial II* is highly recommended for players 16 and over, although bright 12-year-olds will be able to follow it, too. Players should be sure to carefully question the sheriff, and some system should be used to keep each counsel from giving tips to the witnesses when they're on the stand.

NOW LET'S SEE YOU GET OUT OF THIS . . .

This year's strategy/arcade games have been highly imaginative, very playable, and, for the first time, good for large groups of players. The best of these, *Countdown to Shutdown*, is also the most applicable to the season, since up to eight players can participate with their own joystick-controlled characters.

When I reviewed Infocom's text adventure *Suspended* last year, I kept wondering why no company had ever marketed a live-action game using various robots to perform tasks no single-skilled 'droid could ever accomplish.

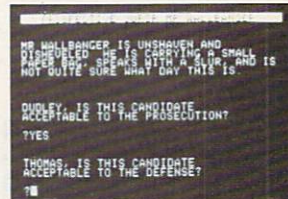
Well, the folks at Activision have done just that. *Countdown to Shutdown* is one of the most exciting strategy/arcade games ever devised. A single player or a team controls eight robots, each having many abilities but only one sure-fire specialty, such as medical, combat, or technical skill. By using the robots to scout out, map a route through, eliminate opponents in, and shut off a nuclear reactor at the core of a vast, multileveled labyrinth, a disastrous meltdown is averted.

There's a hitch, though: Many dangers awaiting your crew of nonhuman helpers are nearly impossible to overcome. You control only one of your staff at a time, and this means needing to learn each one's capabilities and limitations. After that, you can figure out ways to make them work together more efficiently. Eventually, they may reach the close, working relationship the robots in *Suspended* were able to attain.

Joysticks control the game, so it's fast-moving and relatively easy to learn. The graphics are slick and offer a great new option: reverse angle shots of any room you enter. These can be obtained by turning off the operating overhead "camera" in one corner of the room, and turning on the one in the opposite corner.

MOST OF ALL, HAVE FUN

Regardless of which games you choose to play, the idea is to have fun. And the best way to do that is not to take what you're doing too seriously. If your playing gets overly competitive, the warm holiday atmosphere may dissipate quickly. So, please, get into the sharing spirit of the season, not solely the spirit of victory. ☐



(Top) *Infidel*, (middle) *On-Field Football*, and (bottom) *Jury Trial II*.

GAME SOFTWARE DIRECTORY

Countdown to Shutdown: Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94039; (415) 960-0410. Available for 64K Apple II series, C 64; \$30.

Infidel: Infocom, Inc., 55 Wheeler St., Cambridge, MA 02138; (617) 492-6000. Available for 48K Apple II series, 48K Atari, C 64, 128K IBM PC/PCjr, 128K Macintosh, 48K TI-99/4A, 48K Tandy Model III; \$39-\$44.

Jury Trial II: Navic Software, P.O. Box 14727, N. Palm Beach, FL 33408; (305) 627-4132. Available for 48K Apple II series, C 64, 128K IBM PC/PCjr; \$49.

On-Field Football: Gamestar, 1302 State St., Santa Barbara, CA 93101; (805) 963-3487. Available for C 64/128; \$30.

PQ The Party Quiz Game: Suncom, Inc., 260 Holbrook Drive, Wheeling, IL 60090; (312) 459-8000. Available for 48K Apple II series, 32K Atari, C 64; \$46-\$50.

The Shattered Alliance: Strategic Simulations, Inc., 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043; (415) 964-1353. Available for 48K Apple II series, 48K Atari; \$20-\$30.

The Shattered Alliance Tool Kit: (see above for address and phone) \$15 for Apple.

Suspended: same information as for *Infidel*.

Technology With a

IN THE STORY OF ONE COUPLE,
FIFTEEN CHILDREN, AND FIVE COMPUTERS,
MIRACLES DO HAPPEN

BY LINDA WILLIAMS

In the spring of 1984, we and our five adopted children decided we had enough love to open our home and hearts to more children. Currently we have a total of 15. Almost all come from extremely traumatic backgrounds that include battering, sexual abuse, and neglect. Often they come to us from as many as seven different foster homes each, from institutions, or juvenile halls. They come believing in their own fundamental uselessness to society.

They were so used to failing that failure had become a security. We needed some new way to facilitate and guide their learning and repatterning in a manner that would make such failure unlikely. Surprisingly, that answer came in the form of five free computers.

—SUNOW BRADLEY, 39,

in his First Prize entry for the 1985 Computing Family of the Year Contest.

**WHEN AKOS
PLAYS SHAPE-
MATCHING
GAMES ON THE
COMPUTER,
HE'LL OFTEN
SHOUT, "AHA,
NOW I'VE GOT
YOU! I KNEW
YOU WERE A
TRIANGLE."**

Not long ago, "computer" was just a word to Sunow and Spirit Bradley (aka Joe and Donna), a young, outdoorsy couple reminiscent of the sixties. Then, as now, they strove to lead a simple life close to nature, and to provide a secure, happy home to a growing number of children.

Today, "computers are central to our lives," says Sunow, a craftsman, teacher, and counselor. In serene Mountain Grove, Oregon, five computers provide fun, education, and therapy for the Bradley family. Few families are fortunate enough to have benefactors who can provide them with computers. Yet this is exactly what happened to the Bradleys. In the span of a year, concerned friends donated an Apple II plus, an Apple IIc, two TI-99/4As, a Tandy CoCo, and several thousand dollars worth of software. Few families are as unique in their needs as the Bradleys, with so much to gain in such a variety of ways from computers.

A QUIET LIFE ENRICHED BY COMPUTERS

A typical day on the Bradley homestead begins with breakfast and cleanup, after which the children go off for special projects with neighbors. The teenagers go to a machine shop, where they do woodcarving or other work, while some of the younger kids visit a former concert pianist for music lessons.

Meanwhile, Spirit and Sunow might col-

laborate at the Apple IIc, writing scripts for seminars they conduct (often on the topic of parenting) or working on one of their books. Alternatively, they might spend a quiet morning in their stained-glass-making studio.

After lunch, formal education takes place in makeshift classrooms. The Bradleys began their state-registered private school in March 1984, after deciding that public schools weren't equipped to deal with their children's specific emotional problems. The Apple II plus plays an important role in the school, providing the perfect therapy necessary for many learning activities. It is used with *Math Blaster!* (by Davidson & Assoc.) to demonstrate math concepts, or with *Dazzle Draw* (by Broderbund) to encourage creativity.

With parents that double as teachers, it's not surprising that school and play often merge. For instance, the Bradley children write to distant friends and families with Quark, Inc.'s *Word Juggler*, which has a spelling checker. "Words they misspell become word lists for programs such as *Spellicopter* and *CryptoCube* [both by DesignWare, Inc.], and are incorporated into their schoolwork," Sunow says.

THE COMPUTER AS CHALLENGING TEACHER AND PATIENT FRIEND

A favorite of the children's is *The Print Shop* (by Broderbund), which they use to create cards for their natural parents, special awards for siblings, and welcome banners for new foster children. Many of *The Print Shop* creations the children work on strike an emotional chord. Sunow remembers one child's recent effort: "Hi Mom, Why did you give me away? I'm still mad at you but I still love you."

The Newsroom (by Springboard Software, Inc.), a new addition to the library, looks like a winner—especially in the eyes of 11-year-old David and 14-year-old Rainbeau. Together they are using it to put out a regular newspaper.

On the average, each child uses the computer four hours a week, yet like most computer users, their interest waxes and wanes. New members of the family, most of whom have never before seen a computer, spend quite a bit of time at the keyboard.

Kanta, age 12, whom the Bradleys adopted three years ago, had never held a pencil or seen

LINDA WILLIAMS frequently writes on the subject of computers. She wrote "Meet the Mancinis of Long Island: 1985 Computing Family of the Year" in the September issue.



The Bradley family, shown in the photograph they submitted with their winning entry for the Computing Family of the Year Contest.

a book when she arrived in the United States from India. Now, she has become quite adept at the keyboard. The computer "work" that excites her the most is the TI program *A-MAZE-ING*. Sunow explains it this way: "Working her way through endless mazes is directly related to the internal mazes of her mind. The twisted paths of starvation, loss of family, a new language . . . seem to unwind themselves as Kanta masters the ins and outs of progressively more difficult computer mazes."

Of course, no computing family would be complete without a resident hacker. In the Bradley household, Kelly, age 18, merits the title. "After we've all gone to bed, he makes himself a pot of coffee and [sits] at the computer," says Sunow. Sometimes foster brother John, 22, will join Kelly for the "night shift," perfecting programs until the wee hours of the morning. Chris, 16, is now also getting the programming bug.

Barbie, 11 years old and autistic, finds *Fire Organ* fascinating (by Vagabondo Enterprises). Although she is mute and extremely withdrawn, Barbie rarely tires of pressing the computer's keys to halt the constantly changing, colorful images.

Seven-year-old Kai Lin was labeled autistic at first, too, but with the help of a computer has emerged from his shell. He "has brought himself beyond our expectations with the help of a computer friend," Sunow says. "He sits for up to an hour, triumphantly calling out the names and sounds of letters in TI's *Early Learning* programs, as he announces with glee, 'See, I'm smart like the big kids!'"

When Akos, now 8, joined the Bradleys five years ago, he'd already lived in seven foster homes. As a result of neglect, he saw himself as a failure. "It took us four months to lure him into the computer room," Sunow says. "Now it takes almost that long to get him back out!" When he plays shape-matching games, he'll often shout, "Aha, now I've got you. I knew you were a triangle. You can't fool me."

While each family member has a favorite piece of software or computer application, the machine is often the focus of group activity. "We use *The Arcade Machine* [by Broderbund] to help write our own games," Sunow says. "We create a game to help [each] child confront his or her worst fears. Many of them have suffered from malnutrition and abuse, so [in the game they] must get through a maze to find the food . . . or the loving arms . . . or the permanent home."

"The kids use the computers to heal themselves. Computers are completely nonjudgmental," he explains. "The worst thing that happens is the computer glitches."

Yet the computer's effect isn't limited to work at the terminal. The Bradleys have noticed computer terminology and thought patterns creeping into their daily lives. "During times of emotional stress, we hear ourselves using computer analogies to express psychological difficulties," Sunow says.

"We are proud and excited about our family and the way we are using computers," he says. "To help heal the psychological wounds of a child is a most appropriate and wonderful use of technology—technology with a heart." ☐

HOW ABOUT YOUR FAMILY?

Is your family putting your computer to especially good or unusual use? If so, yours could be the 1986 Computing Family of the Year! Watch for our contest announcement and prizes in the January FAMILY COMPUTING.

HANDS ON CLEAN YOUR COMPUTER AND LOOK AROUND INSIDE

BY HENRY F. BEECHHOLD

(Part Two of a Six-Part Series)

Cleanliness may be recommended as a mark of politeness . . .
—Joseph Addison

In this month's "Hands On," we'll open up the computer, clean out the dust, grime, grit, and grunge, and learn a little about what the electrons do in there. You'll get familiar with your computer's gross anatomy while learning procedures for safe disassembly (and reliable reassembly!). And while you won't actually need a multimeter for this exercise, I'll give you a lightning-fast introduction to using one.

At this point, a reminder is in order: If your computer or its peripherals are still under warranty, you should not tamper with them. After that, it's on your head, as they say.

WAR AGAINST CRUD

If you've owned your computer system more than about six months, you'll be amazed at how much grime has accumulated inside the case. All electronic devices produce some heat and require cooling, but the vents that let cooling air inside your system also let in dust, hair, smoke particles, and grit. Cooling fans, while necessary in some computers, can make matters even worse. They're marvelous "vacuum cleaners" with the computer itself playing the vacuum bag!

So what's the big deal about computer crud? The answer is that it can interfere with airflow, causing electronic components to overheat and eventually fail. It can cause electrical connections to become intermittent, creating hard-to-track glitches and erratic system behavior. It can even cause premature wear of disk drive or cassette heads, and shorten the life of mechanical parts in keyboards, disk drives, and printers.

The weapons in the war against crud: **1.** a screwdriver for opening the computer case; **2.** one or more small containers for temporarily

storing the screws, washers, and other fasteners you remove (a discarded plastic egg carton is great for this—its pockets provide discrete storage for a dozen different types of widget, and can easily be labeled with a felt-tip pen); **3.** a vacuum cleaner with a small, round brush; **4.** a can of *Dust-Off* (compressed air); **5.** a can of *electrical-contact cleaner*; **6.** a bottle of uncolored *isopropyl (rubbing) alcohol*; **7.** cotton swabs; and **8.** an eraser, as in pencil.

THE GREAT UNVEILING

Ready? Okay, start by unplugging all external cables and cords. Note which gets plugged into what, and check the condition of the cords as you remove them. If any are noticeably damaged, they should be replaced.

Now, turn the enclosure upside down and remove the screws. These may be recessed, so once you've loosened them, you'll have to turn the system right-side-up again before they'll let go and fall out. A bit of tape stuck over each recess can help keep them from running away. Store the screws (lock washers, etc.) in your containers, keeping each type separate, and making a note of where each type belongs.

Remove the top half of the shell—the lid, if you will—and slowly lift it off, making sure you are not pulling any cables that may tie the upper and lower parts of the enclosure together. If such connections exist, you should still be able to angle the lid so that you can put it down a little to one side of the base. Or you may be able to unplug these cables. If you're peering inside a Commodore 64, for example, you'll note that the keyboard half of the case is attached to the bottom (circuit board) half by two connectors. You can gently pull these loose, noting the orientation of each before you make the break.

Note: It's always a good idea to make notes and drawings as you go along. This "log" is invaluable in helping you keep track of the work.

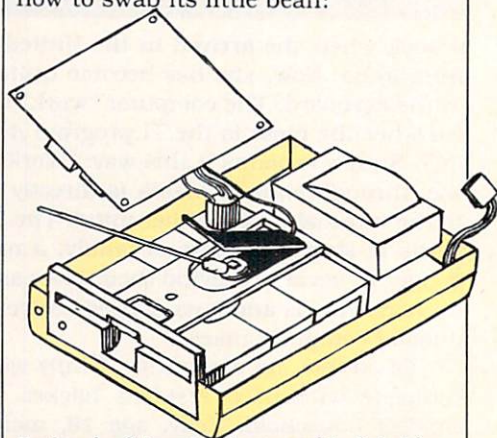
Observe your computer's beauty bare. Well, it's probably not all that beautiful, but it surely has an impressively functional look about it.

The best move at this point is to the out-of-doors. Dusting should perhaps be called "dust rearranging." But if you do your dust-blow-

ing and vacuuming outside, at least your computer room will be spared this particular rearrangement. Run the small vacuum brush gently over the computer's inner space. Then give it a good nook-and-craney blasting with compressed air. Finally, run the vacuum brush around one more time.

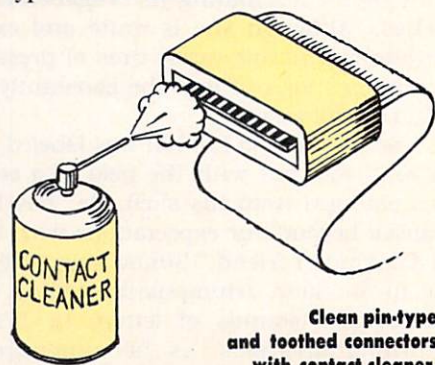
This kind of treatment can also be afforded your printer. If your computer has separate disk drives, you might want to give them a fast blast and cleanup. But use all gently, dear friends. Make certain not to bend, bang, or otherwise distress the equipment.

While you've got the disk-drive box open, you can clean the drive's read/write head, which, over time and use, builds up a coating of oxides and dirt. Here's what you'll see in a Commodore 1541 disk drive, and how to swab its little bean:



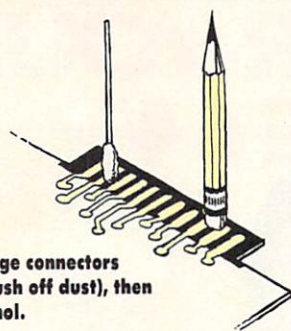
Unplug circuit board and move aside. Rub drive head gently with cotton swab moistened in isopropyl alcohol.

Now, back to the computer room, where you are ready for internal connector cleaning. The drawing will show you what types of connectors you're likely to find and how each type can be cleaned.



Clean pin-type and toothed connectors with contact cleaner.

HENRY F. BEECHHOLD, professor of English and chairman of the Interdisciplinary Linguistics Program at Trenton State College, is a computer tinkerer and do-it-yourselfer par excellence. He is the author of *The Plain English Repair and Maintenance Guide for Home Computers*, and *The Plain English Maintenance and Repair Guide for IBM Personal Computers* (both published by Simon & Schuster, 1984/85).



Burnish card-edge connectors with eraser (brush off dust), then swab with alcohol.

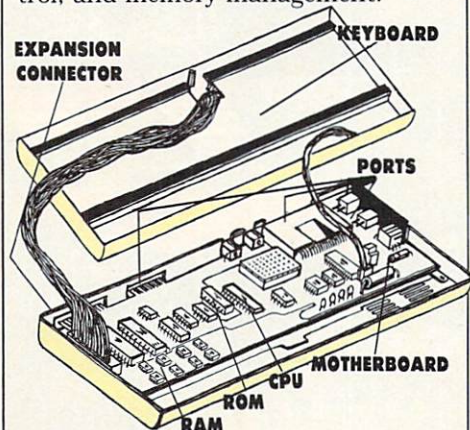
Having satisfied yourself that you have brought the innards of your computer to a new level of cleanliness, you should now pause to admire the fruits of your labor, and think a bit about what all that electronic stuff is for.

FUNCTIONS AND FACILITIES

Think of your computer system as a set of functions and facilities, thus:

1. Entrances and exits: connections to and from the outside world. Depending on the particular computer, you'll find receptacles for the power cord, the keyboard cable, the video cable, the disk drive and/or cassette recorder cables, the printer cable, the modem cable, and the plug-in cartridges. Other than the power plug/receptacle, these connection points are usually called "I/O ports" or just "ports."

2. Computer operations: a main circuit board (motherboard) packed with a lot of integrated circuits and dominated by a CPU (Central Processing Unit) or microprocessor. Computer operations include internal "traffic control"—control and timing of information flow from component to component—I/O control, and memory management.



3. Human input: a keyboard, a joystick, sometimes a mouse or specialized device.

4. Visible output: a video dis-

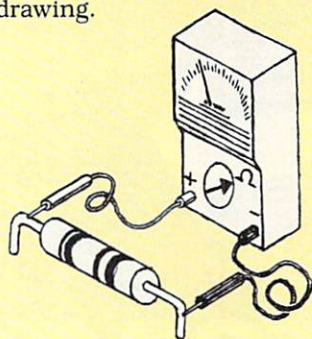
play (television or video monitor), and printer.

5. Storage: temporary, semipermanent, and permanent. RAM memory inside, disk drive(s) or cassette recorder outside. ROM (read-only memory) chips both on the motherboard and in plug-in cartridges.

6. Expansion: slots for supplementary circuit boards which provide extra memory, special graphics, telecommunications (via modem), etc.

A SHORT COURSE IN METERING

Pictures and talk have their place, but if you have a multimeter, give it a little workout. Set the selector to "Ohms" and locate a resistor on the computer circuit board. It will look like a little tube with colored bands which denote the resistor's value in a standard color code. With the computer turned OFF, and the multimeter turned ON, place one probe on one lead of the resistor and the other probe on the other, as shown in the drawing.



Depending on whether you have a digital or analog multimeter, numbers will appear on the meter display, or the needle will swing over. This shows that **1.** the electrical path between the meter probes (i.e., through the resistor) is unbroken (continuous), and that **2.** the resistor is "resisting."

Continuity testing with a multimeter is *very* useful for finding that dead component, broken wire, or scratched circuit-board trace. When used as a resistance or continuity tester, the multimeter may show:

1. no numbers at all, or *infinite* resistance (indicating a broken circuit); **2.** various readings, indicating a specific resistance value; or **3.** zeros, indicating *no* resistance—the kind of reading you would get by touching the probe tips to an unbroken wire, or by touching them together.

IN THE CHIPS

In addition to the CPU and various chips that perform electronic house-keeping functions, the motherboard will usually contain video-display circuitry, I/O and disk-drive control circuitry, and memory circuitry. There will also be a "monitor" chip, a kind of assistant to the CPU. This is a ROM chip—a memory chip with a set of programs permanently "burned" into it. Programs in the monitor ROM do such things as test the computer's memory, boot up the disk system, and allow you to peek into the computer's hoards of 1's and 0's.

The CPU—whether 8-bit (as in the Apple II series, the Commodore, and others); 16-bit (as in the IBM PC); or 32-bit (as in the Macintosh, the Atari 520ST, and the Amiga)—determines in great measure the capabilities of the computer. The bit-value refers to the way in which the CPU handles clumps of data. The bigger the clump, the more "powerful" the CPU.

WHEN THINGS GO SOUR

Many computer manufacturers will socket those chips most likely to go sour. As a rule, these are the large IC's (Integrated Circuits, like the CPU, monitor ROM, and I/O chips), and the memory chips. Examine your computer and note which chips are socketed and which are soldered right into the board. Although a soldered chip can be replaced, this is a job I do not recommend. There's a strong likelihood that you'll damage the circuit board beyond your ability to repair it. On the other hand, it's a fairly simple matter to remove a chip from a socket and (carefully) shove in a new one.

How does one know which chip to replace? Good question—can't be answered in a sentence. We'll give you some hints later on in this series. Meanwhile, today's lesson intends only to encourage housecleaning and to introduce you to your computer's anatomy. No pathology is assumed!

And now our whirlwind tour draws to an end. Carefully reconnect all the interior cables and reassemble the computer. Reconnect all the exterior cables and cords, and fire up your system, confident that whatever problems may arise in the future, they won't be caused by dust, grease, grime, or grunge. ☐

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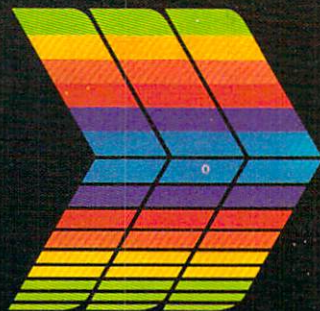


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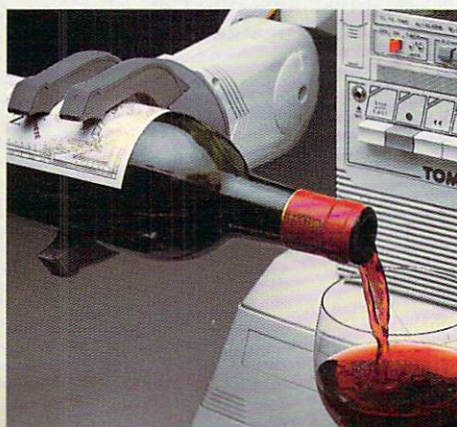
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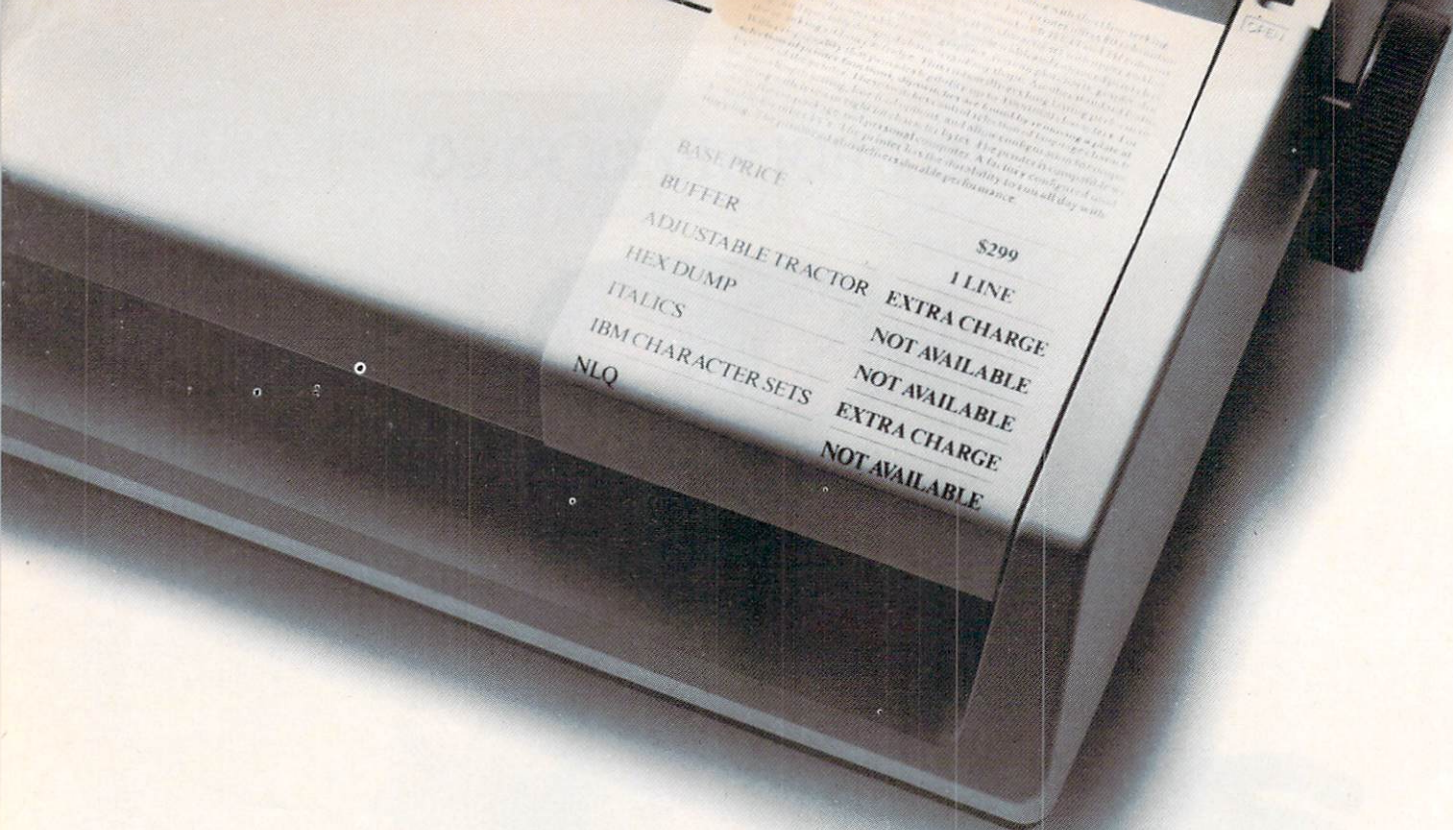
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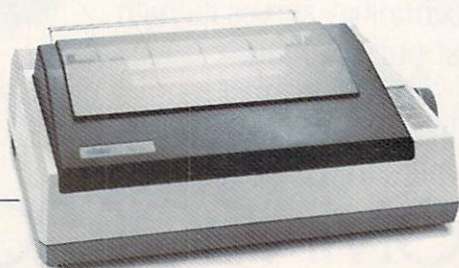
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Too many big-winded printer companies are sticking it to too many unsuspecting consumers. Making a lot of noise about features that aren't featured at all.

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TIPS TO THE TYPIST

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PROGRAMMING P.S.

Page 60

**MORE PROGRAMS
IN K-POWER**

Pages 84,88

BEGINNER PROGRAM

Page 50

Get into the holiday swing with *Jingle Bells*, and learn how to make your computer sing a melody!

PRODUCTIVITY PROGRAM

Page 61

Wordcount may be just the holiday gift your word processor is hoping for!

HOLIDAY PROGRAM

Page 66

Indulge your creativity with *Christmas Tree Construction Set*. This Yuletide utility is great for designing dynamic decorations!

ILLUSTRATION BY JIM CHERRY III

Cherry

TIPS TO THE TYPIST

Typing in FAMILY COMPUTING'S programs is a great way to become familiar with your computer and get some free software "to boot." But it's frustrating to type in a long program only to find it doesn't work as it should. When this happens, simple typing errors are most often the cause. So to help you gain greatest value from the time you spend computing with us, we've put together some tips on how to avoid typing errors—and what to do if a program doesn't run right. Read them carefully and you'll be up and running in no time!

SOME GENERAL RULES

1. Do read instructions and program headings carefully. Make sure your computer has enough memory, the right version of BASIC, and the appropriate peripherals (joysticks, printers, disk drives, etc.) for a program.

2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, try typing in shorter programs first. Type in a longer program in easy stages, **SAVE**ing each installment as you go.

3. Until you are fairly familiar with BASIC, **do** assume that every word, number, letter, space, and punctuation mark in a program listing must be copied accurately if the program is to function as intended.

4. Do watch out for potential trouble spots. About 90 percent of all typing errors occur in **DATA** statements: long lines filled with numbers or incomprehensible secret codes. If possible, have someone else read **DATA** to you as you type, and help you proofread it if you have trouble later on. Proofreading from a printout is best.

5. Do be aware that program listings printed in FAMILY COMPUTING sometimes differ from what you will see on your computer's screen or in printouts you produce at home. Our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press **RETURN** or **ENTER** until you've checked to see if the program "line" you're typing really ends there. The way to tell is to check if the line following begins with a multiple of 10 that follows in sequence from the previous logical line. **REM** statements are the exception and typing them in is optional.

Several computers (ADAM, Apple, Atari, and TI) format BASIC programs according to unique rules of their own. Don't let this throw you—just type in the listing exactly as printed in the magazine and your computer is guaranteed to accept it, even though it may end up looking a little different on your screen.

6. One foolproof way to correct an error in a BASIC program line is to type the line in again from the beginning, and press **RETURN** or **ENTER** to set it in place of the old one in your computer's memory.

WHICH PROGRAMS WILL RUN ON MY COMPUTER?

Unless a program heading indicates otherwise, programs

will run on any version of the computer specified, with the following exceptions:

- Apple programs run under Applesoft (*not* Integer) BASIC on the Apple II (with language card), II plus, IIe, and IIc.
- IBM compatibility of BASIC programs is determined by both the hardware and the version of BASIC used. Our programs for IBM PC & compatibles are composed on IBM PC & PCjr's, and tested under most versions of BASIC available for these machines. They are then tested on a variety of IBM-compatible machines under the versions of BASIC supplied with them. Each "IBM PC & compatibles" program listing is supplemented by a rundown of the machines and versions of BASIC under which the program is guaranteed to work. Most programs will probably run on many other PC Compatibles and under other versions of BASIC.
- TI programs not marked "w/TI Extended BASIC" should be run under standard (console) TI BASIC.

DEBUGGING HINTS

Sometimes even the most careful typist makes a mistake. Don't expect your program to run right off the bat. If you have problems, remain patient and follow these general instructions for a probable quick fix.

- 1.** Write down any error messages you receive.
- 2.** If necessary, look these up in your manual, and check the indicated lines for simple mistakes. Also check related lines (see No. 4, below), such as the **DATA** statements corresponding to a **READ** routine. Correct all the problems you can find, and **SAVE** a corrected copy of the program before typing **RUN** again. If you're lucky, all systems will be **GO**; if not
- 3.** **LIST** the program in screen-size chunks (check your manual for instructions on how to **LIST** parts of a program). Even better, if you have a printer, get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't typed the numeral 0 (which is slashed in our listings) for the letter O (which isn't), swapped a small letter "l" for the numeral one, dropped or mixed up some punctuation, switched uppercase text for lowercase, or vice versa (particularly in **DATA** statements or within quotes), or miscounted the characters (and/or spaces) between a pair of quotes. Get someone to help you if possible.
- 4.** Check your **DATA** statements—then check them again. Mistakes in **DATA** statements are the single most common cause of program failures. Bad data can cause a program to malfunction at any point, which can be misleading. If you can't find your error in the lines the computer specifies, check your **DATA** statements line by line, letter by letter, comma by comma. Then have someone else check it for you.
- 5.** If all else fails, turn off your computer and relax. Then try again the next day—exhausted proofreaders are careless proofreaders.

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An Apple IIc



An Apple IIc with Z-RAM

The Apple IIc on the right works exactly the same as the Apple IIc on the left. Almost. The Apple on the right has a powerful memory expansion coprocessing card called Z-RAM. From Applied Engineering. Which means the Apple on the right can completely load AppleWorks into RAM—and then run it up to thirty times faster than the Apple on the left.

Z-RAM also acts as a solid-state disk drive. Which means the Apple on the right will load and store programs up to 30 times faster. And, our included RAM disk is compatible with Applesoft, PRO-DOS, DOS 3.3, PASCAL and CP/M.

Turbo Charged AppleWorks.

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There's more. Z-RAM has a built-in high speed Z-80B microprocessor that allows you to run CP/M programs. Which means you now have access to the single largest body of software in existence, including popular packages like WordStar, dBase II, Turbo PASCAL and Microsoft BASIC. A 16 bit option is also available.

And still more. Z-RAM is compatible with all IIc software and hardware, installs easily in just ten minutes with a screwdriver (slightly longer without), is available with 256K or 512K of additional memory (a 256K Z-RAM can be upgraded to 512K at

any time). Z-RAM is easily handled by the IIc power supply with our patent pending power saving design.

The only thing better than that would be a recommendation from Steve Wozniak.

"I recommend Applied Engineering products wholeheartedly." (Of course, Steve's IIc has a Z-RAM installed.)

Steve Wozniak, the creator of Apple Computer



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Z-RAM comes complete with simple instructions, RAM disk software, Z-80 operating system, CP/M manual. And a five year "hassle free" warranty. Make a good Apple great. With 256K Z-RAM "384K total" (\$359); with 512K "640K total" (\$419); 16 bit option may be added later (\$89).

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JINGLE BELLS

(With Tutorial, "How to Write Music Programs")

BY JOHN JAINSHIGG AND PAUL DIXON

Jingling bells is one way to make beautiful music. It's as easy as grabbing the right bell at the right time and then ringing it for the correct length of time. Unfortunately, most people don't have a set of musical bells around the house. However, if you're reading this, chances are you do have a computer. More than likely, it can play music—if you can tell it what notes to play, when to play them, and for how long.

Our Beginner Program this month is a short music program that will surely put you and your computer into the holiday swing of things. Type the program in, SAVE it to disk or cassette, then RUN it. Be especially careful when typing in the DATA statements. If all goes well, in a few moments you'll hear *Jingle Bells* jingling through the house. And if you want to understand how it works—or make the program play a different song—read on!



HOW TO WRITE MUSIC PROGRAMS

Playing a note in BASIC differs from one brand of

computer to another. Some computers have a SOUND command that lets you produce tones and, in some cases, control a sound's duration, volume, and sometimes even its quality (whether the tone sounds pure or distorted; like a flute, or like a piano). The table below shows SOUND commands for various systems as we have used them in *Jingle Bells*.

Not all computers have SOUND commands. Commodore 64 sound is controlled by placing numbers in certain memory locations, using POKE statements. A special machine-language routine, also controlled by POKES, makes sound on the Apple, and the ADAM's sound chip must be controlled by a combination of machine code and POKES as well. However, all simple SOUND commands and "POKE-and-play" sound-making schemes have one thing in common. They all use numbers to represent the pitch and other characteristics of a note, though the range of numbers used varies widely from computer to computer.

To turn a melody into a program, you start by converting each of its pitches into a number, according to a table of equivalents found in the BASIC manuals that come with most computers. ADAM and Ap-

ple owners will have more difficulty than others in doing this. Procedures for controlling ADAM sound are quite complex, and are not explained in Coleco's documentation. Interested readers should consult *ADAM's Companion*, by Ramsey Benson (Avon Books, 1984, \$9.95). Numbers used to specify pitches on the Apple change, depending on what machine-language routine is used to generate the sound. A partial table of numeric values for the machine-language routine we used in *Jingle Bells* is shown below.

| | |
|--------|---------|
| | G = 162 |
| | A = 144 |
| | B = 128 |
| Middle | C = 121 |
| | D = 108 |
| | E = 96 |
| | F = 91 |
| | G = 81 |

To play a note using the machine-language routine shown in the Apple version, you start by READING the machine code from DATA statements and POKE-ing it into addresses 768–796 in memory (see lines 30–60 and DATA in lines 1000–1020). POKE a duration number (from 2 to 255) into location 6 and a pitch number into location 8; then play the note by CALLING the routine using the statement CALL 768 (see lines 120, 130, and 140).

| Computer | SOUND command format | Description |
|------------------------------------|----------------------|--|
| Atari | SOUND CH,P,T,V | Sound continuous tone through channel CH at pitch P, using tone quality T, at volume V. |
| IBM PC & compatibles | SOUND P,D | Sound pitch P for duration D. Additional, optional parameters allow control of channel and volume. |
| Macintosh (Microsoft BASIC 2.0) | SOUND P,D | As above. |
| TI-99/4A | CALL SOUND (D,P,V) | Sound pitch P for duration D at volume V. Additional, optional parameters allow added voices to be played with the same command. |
| Tandy CoCo | SOUND P,D | Sound pitch P for duration D. |

DURATION AND TEMPO

Playing a musical note on your computer takes three steps: 1. start playing the note; 2. wait for a specific length of time; and 3. stop playing the note. If your computer's sound-producing scheme lets you specify a note's duration at the same time you specify its pitch (Apple, IBM, Macintosh, TI, and CoCo work this way), you won't have to do any programming to handle steps two and three. Just supply the computer with a number for the note's duration—larger values cause a note

ILLUSTRATIONS BY JOSH GOSFIELD

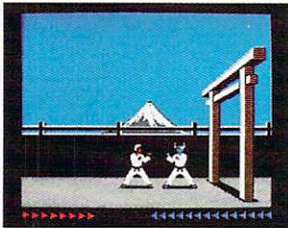
(EEEE-YAHHH!!!)

*You are the star of a Martial Arts movie so real,
you'll feel it like a kick in the ribs.*

KARATEKA, you have learned well the disciplines of karate...but now it is time to put your skills to the test. Your village has been ransacked, your friends and family scattered to the winds, your bride-to-be, Princess Mariko, kidnapped and cruelly imprisoned by the evil warlord Akuma. If you ever hope to see her again, Karateka, you know what you must do.

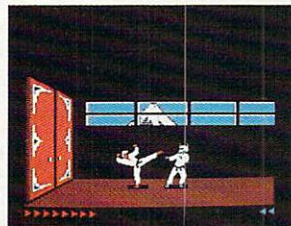
Scale the mighty cliffs that lead to Akuma's fortress. There, you will encounter the first of many palace guards. Kick! Thrust!

Parry! At every turn you will face yet another warrior, each stronger



than the last.

Finally, Karateka, you will come face-to-face with Akuma himself. Here your fate will be decided. Either eternal happiness or instant death. THE MAKING OF KARATEKA.



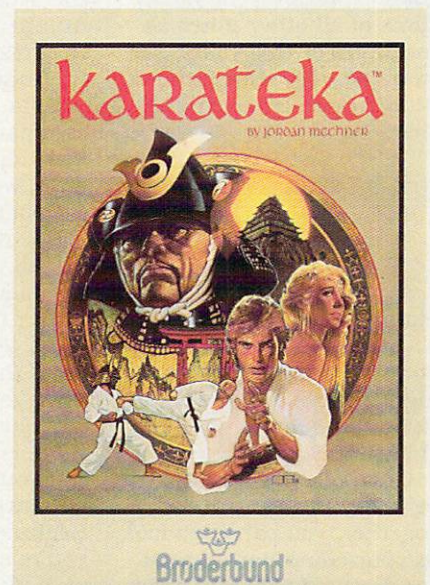
"Karateka" designer Jordan Mechner is a karate enthusiast and a stickler

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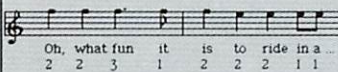



Broderbund®

to play for a longer time—and the computer will sound the note and turn it off automatically.

If your computer's SOUND command or sound-making scheme doesn't incorporate a duration feature (ADAM, Atari, Commodore 64, and VIC-20 don't), your music program will have to include a routine that counts while each note is playing for a length of time you specify. In *Jingle Bells*, this counting is done by a FOR/NEXT loop that counts up to a different number for each note. (To learn more about "delay" loops, see Jitterman in the August FAMILY COMPUTING.)

Each note in your melody has a particular duration relative to the other notes and rests. That is, an eighth note is always half as long as a quarter note, which is half as long as a half note, and so on. Keeping this in mind, you can calculate the relative durations of the notes in your melody by finding the notes with the shortest durations, giving these notes an arbitrary value of 1, then expressing the durations of all other notes as multiples of this value. For example, one phrase of *Jingle Bells* is coded like this:



As you can see, here eighth notes get the value 1; quarter notes, which sound for twice as long as eighth notes, get the value 2; dotted quarter notes, the value 3.

Once you've got a table of relative durations pulled together, you can then look at your computer manual (or do some trial-and-error testing) to determine what should be the duration value for your shortest note. The computer can multiply each of the relative duration values by this "tempo constant" to derive the actual duration value for

each note.

For example, if the tempo constant (called TEMPO in our program) is 24, the actual duration values for the first four notes in the phrase "Oh, what fun . . ." are 24×2 , 24×2 , 24×3 , and 24×1 (that is, 48, 48, 72, and 24). Increasing the value of TEMPO slows down the tune; decreasing the value speeds it up. Try it and see!

DOING IT YOURSELF

Adventuresome programmers may want to try modifying *Jingle Bells* to play a melody of their own. Start by deciding on a tune and converting each of its notes to a set of pitch and relative duration values as described above. Substitute this data, alternating pitches and durations, for ours in the DATA statements. There are 144 notes in *Jingle Bells*; the number of notes in your tune will probably differ. Count them and change the size of the storage arrays (DIMENSIONED in lines 10 or 20) to match. Change the upper limit of the FOR/NEXT loops that READ data into the arrays to match this number also, and that of the FOR/NEXT loop that plays the tune as well. Remove the statements that duplicate parts of the *Jingle Bells* melody—your program won't need them (the REM statements will show you which these are).

If all goes well, your tune will play when you type RUN. If the speed isn't right, you can alter the value of the constant TEMPO until you hear something you like better. That's all there is to it!

If you come up with an enhancement of one of our Beginner Programs that you're especially proud of, we'd like to see it, and maybe mention it in a future issue. Send a printout (no tapes or disks, please) to

Beginner Programs
FAMILY COMPUTING
730 Broadway
New York, NY 10003

—J.J.

ADAM/Jingle Bells

```

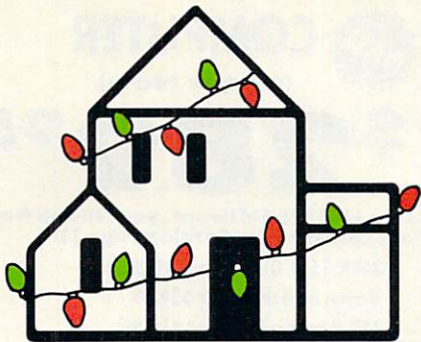
9 REM --PROTECT MEMORY FOR STORING MACHINE CODE--
10 LOMEM: 29000
20 DIM f(144),s(144),d(144)
30 tempo = 100
39 REM --READ IN MACHINE CODE FOR SOUND--
40 FOR i = 28000 TO 28005
50 READ a
60 POKE i,a
70 NEXT i
79 REM --READ IN SONG DATA (FIRST, SECOND, DURATION)--
80 FOR i = 1 TO 95
90 READ f(i),s(i),d(i)
99 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
100 IF i < 50 THEN f(i+95) = f(i):s(i+95) = s(i):d(i+95) = d(i)
110 NEXT i
119 REM --PLAY SONG--
120 FOR i = 1 TO 144
129 REM --TURN ON VOLUME FOR VOICE 1--
130 POKE 28006,144
140 CALL 28000
149 REM --SET FIRST PART OF PITCH FOR VOICE 1--
150 POKE 28006,f(i)
160 CALL 28000
169 REM --SET SECOND PART OF PITCH FOR VOICE 1--
170 POKE 28006,s(i)
180 CALL 28000
189 REM --DELAY FOR NOTE'S DURATION--
190 FOR j = 1 TO d(i)*tempo
200 NEXT j
209 REM --TURN OFF VOLUME FOR VOICE 1--
210 POKE 28006,159
220 CALL 28000
230 NEXT i
240 END
999 REM --MACHINE CODE TO SEND SOUND DATA TO CHIP--
1000 DATA 58,102,109,211,255,201
1999 REM --SONG DATA--
2000 DATA 138,10,2,138,10,2,138,10,4,138,10,2,138,10,2
2010 DATA 138,10,4,138,10,2,143,8,2,134,13,3,143,11,1
2020 DATA 138,10,8,128,10,2,128,10,2,128,10,3,128,10,1
2030 DATA 128,10,2,138,10,2,138,10,3,138,10,1
2040 DATA 138,10,2,143,11,2,143,11,2,138,10,2,143,11,4
2050 DATA 143,8,4,138,10,2,138,10,2,138,10,4,138,10,2
2060 DATA 138,10,2,138,10,4,138,10,2,143,8,2,134,13,3
2070 DATA 143,11,1,138,10,8,128,10,2,128,10,2,128,10,3
2080 DATA 128,10,1,128,10,2,138,10,2,138,10,3
2090 DATA 138,10,1,143,8,2,143,8,2,128,10,2,143,11,2
2100 DATA 134,13,8,142,17,2,138,10,2,143,11,2,134,13,2
2110 DATA 142,17,7,142,17,1,142,17,2,138,10,2
2120 DATA 143,11,2,134,13,2,143,15,8,143,15,2,128,10,2
2130 DATA 138,10,2,143,11,2,131,14,8,143,8,2,143,8,2
2140 DATA 128,10,2,143,11,2,138,10,8,142,17,2,138,10,2
2150 DATA 143,11,2,134,13,2,142,17,7,143,17,1,143,17,2
2160 DATA 138,10,2,143,11,2,134,13,2,143,15,8
2170 DATA 143,15,2,128,10,2,138,10,2,143,11,2,143,8,2
2180 DATA 143,8,2,143,8,3,143,8,1,143,7,2,143,8,2
2190 DATA 128,10,2,143,11,2,134,13,4,143,8,4
    
```

Apple II series/Jingle Bells

```

10 DIM P(144),D(144)
20 TEMPO = 24
29 REM --READ IN MACHINE CODE FOR MAKING SOUNDS--
30 FOR I = 0 TO 28
40 READ A
50 POKE 768+I,A
60 NEXT I
69 REM --READ IN SONG DATA (PITCH, DURATION)--
70 FOR I = 1 TO 95
80 READ P(I),D(I)
89 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
90 IF I < 50 THEN P(I+95) = P(I):D(I+95) = D(I)
    
```

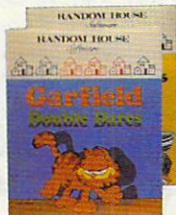

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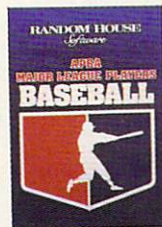
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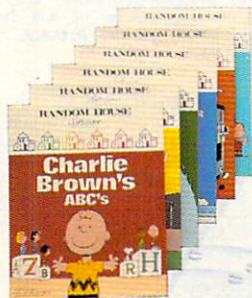
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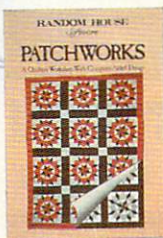


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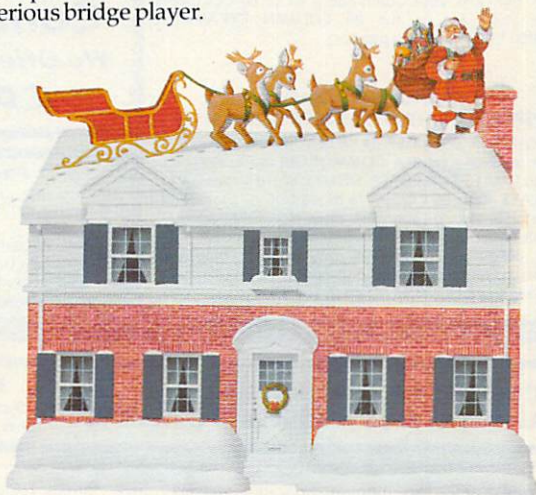


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\$ 139⁹⁵

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- Commodore Graphics Printer \$99.95
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80 COLUMN

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Now you program 80 COLUMNS on the screen at one time! Converts your Commodore 64 to 80 COLUMNS when you plug in the 80 COLUMN EXPANSION BOARD!! PLUS 4 slot expander!

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Less \$30 FREE Software, your choice from our catalog (See Catalog Page 13)

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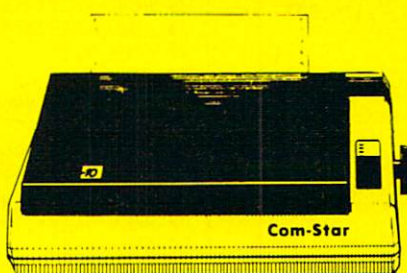
10" Printer

SALE \$179⁰⁰ SALE

10" Comstar 10X — This Bi-directional Tractor/Friction Printer prints standard sheet 8½"x11" paper and continuous forms or labels. High resolution bit image graphics, underlining, horizontal tab setting, true lower descenders, with super scripts and subscripts, prints standard pica, compressed, expanded, block graphics, etc. Fantastic value. (Centronics parallel interface.)

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1 Year Warranty
120-140 CPS
Premium Quality



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SALE \$239⁰⁰ SALE

15½" Comstar 15X — Has all the features of the 10" Comstar 10X plus a wider 15½" carriage and more powerful electronics to handle large ledger business forms! (Better than FX-100). The 15½" Comstar 15X also prints on standard size paper and continuous forms and labels. Fantastic value. (Centronics parallel interface.)

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List \$499.00

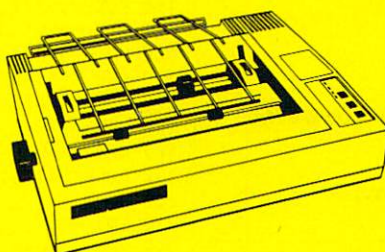
10" Printer

SALE \$229⁰⁰ SALE

10" Comstar 160+ High Speed — This Bi-directional Tractor/Friction Printer combines the above features of the 10" Comstar 10X with speed (150-170 cps) and durability. Plus you get a 2K buffer, 96 user definable characters, super density bit image graphics, and square print pins for clearer, more legible print (near letter quality). This is the best value for a rugged dependable printer. (Centronics parallel interface.)

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150-170 CPS
High Speed



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List \$699.00. Sale \$289.00.

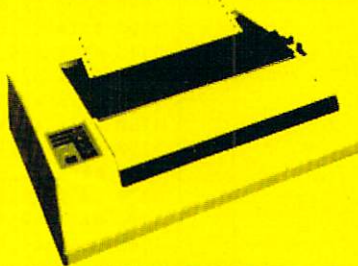
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10" Comstar 2000 — The ultimate printer has arrived! This Bi-directional Tractor/Friction Printer gives you all the features of the Comstar 160 plus higher speed (165-185 cps), 256 downloadable characters, proportional setting, external dark printing mode and a *lifetime printhead warranty. PLUS ...

Lifetime warranty*
165-185 CPS
High Speed & Letter Quality



List \$599.00

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Atari — \$59.00

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CIRCLE READER SERVICE 37

BEGINNER PROGRAM

```
100 NEXT I
109 REM --PLAY SONG--
110 FOR I = 1 TO 144
119 REM --SET DURATION--
120 POKE 6,D(I)*TEMPO
129 REM --SET PITCH--
130 POKE 8,P(I)
139 REM --PLAY NOTE--
140 CALL 768
150 NEXT I
160 END
999 REM --MACHINE CODE FOR PRODUCING SOUND--
1000 DATA 165,8,74,133,10,164,8,173,48,192,136,234
1010 DATA 234,208,251,165,7,56,229,10,133,7,176,237
1020 DATA 198,6,208,233,96
1999 REM --SONG DATA--
2000 DATA 96,2,96,2,96,4,96,2,96,2
2010 DATA 96,4,96,2,81,2,121,3,108,1
2020 DATA 96,8,91,2,91,2,91,3,91,1
2030 DATA 91,2,96,2,96,3,96,1
2040 DATA 96,2,108,2,108,2,96,2,108,4
2050 DATA 81,4,96,2,96,2,96,4,96,2
2060 DATA 96,2,96,4,96,2,81,2,121,3
2070 DATA 108,1,96,8,91,2,91,2,91,3
2080 DATA 91,1,91,2,96,2,96,3
2090 DATA 96,1,81,2,81,2,91,2,108,2
2100 DATA 121,8,162,2,96,2,108,2,121,2
2110 DATA 162,7,162,1,162,2,96,2
2120 DATA 108,2,121,2,144,8,144,2,91,2
2130 DATA 96,2,108,2,128,8,81,2,81,2
2140 DATA 91,2,108,2,96,8,162,2,96,2
2150 DATA 108,2,121,2,162,7,162,1,162,2
2160 DATA 96,2,108,2,121,2,144,8
2170 DATA 144,2,91,2,96,2,108,2,81,2
2180 DATA 81,2,81,3,81,1,72,2,81,2
2190 DATA 91,2,108,2,121,4,81,4
```

Atari 400/800, 600/800XL, & 130XE/Jingle Bells

```
10 DIM P(144),D(144)
20 TEMPO=30
29 REM --READ IN SONG DATA (PITCH, DURATION)--
30 FOR I=1 TO 95
40 READ P,D
50 P(I)=P
60 D(I)=D
69 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
70 IF I<50 THEN P(I+95)=P:D(I+95)=D
80 NEXT I
89 REM --PLAY SONG--
90 FOR I=1 TO 144
99 REM --SET PITCH, VOLUME, AND TONE FOR VOICE 0--
100 SOUND 0,P(I),10,8
109 REM --DELAY FOR NOTE'S DURATION--
110 FOR J=1 TO D(I)*TEMPO
120 NEXT J
129 REM --TURN OFF VOICE 0 TO PREVENT LEGATO--
130 SOUND 0,0,0,0
140 NEXT I
150 END
999 REM --SONG DATA--
1000 DATA 96,2,96,2,96,4,96,2,96,2
1010 DATA 96,4,96,2,81,2,121,3,108,1
1020 DATA 96,8,91,2,91,2,91,3,91,1
1030 DATA 91,2,96,2,96,3,96,1
1040 DATA 96,2,108,2,108,2,96,2,108,4
1050 DATA 81,4,96,2,96,2,96,4,96,2
1060 DATA 96,2,96,4,96,2,81,2,121,3
1070 DATA 108,1,96,8,91,2,91,2,91,3
1080 DATA 91,1,91,2,96,2,96,3
1090 DATA 96,1,81,2,81,2,91,2,108,2
1100 DATA 121,8,162,2,96,2,108,2,121,2
1110 DATA 162,7,162,1,162,2,96,2
1120 DATA 108,2,121,2,144,8,144,2,91,2
1130 DATA 96,2,108,2,128,8,81,2,81,2
```

```
1140 DATA 91,2,108,2,96,8,162,2,96,2
1150 DATA 108,2,121,2,162,7,162,1,162,2
1160 DATA 96,2,108,2,121,2,144,8
1170 DATA 144,2,91,2,96,2,108,2,81,2
1180 DATA 81,2,81,3,81,1,72,2,81,2
1190 DATA 91,2,108,2,121,4,81,4
```

Commodore 64 & 128/Jingle Bells

```
10 DIM H(144),L(144),D(144)
20 TEMPO=50
29 REM --CLEAR SOUND CHIP--
30 FOR M=54272 TO 54295
40 POKE M,0
50 NEXT M
59 REM --SET VOLUME FOR VOICE 1--
60 POKE 54296,15
69 REM --SET TONE QUALITY OF VOICE 1 (ATTACK/DELAY)--
70 POKE 54277,100
79 REM --SET TONE QUALITY OF VOICE 1 (SUST./RELEASE)--
80 POKE 54278,100
89 REM --READ IN SONG DATA (HIGH, LOW, DURATION)--
90 FOR I=1 TO 95
100 READ H(I),L(I),D(I)
109 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
110 IF I<50 THEN H(I+95)=H(I):L(I+95)=L(I):D(I+95)=D(I)
120 NEXT I
129 REM --PLAY SONG--
130 FOR I=1 TO 144
139 REM --SET HIGH PITCH VALUE FOR VOICE 1--
140 POKE 54273,H(I)
149 REM --SET LOW PITCH VALUE FOR VOICE 1--
150 POKE 54272,L(I)
159 REM --SET WAVEFORM FOR VOICE 1 (TURN ON SOUND)--
160 POKE 54276,17
169 REM --DELAY FOR NOTE'S DURATION--
170 FOR J=1 TO D(I)*TEMPO
180 NEXT J
189 REM --TURN OFF VOICE 1 TO PREVENT LEGATO--
190 POKE 54276,0
200 NEXT I
210 END
999 REM --SONG DATA--
1000 DATA 42,60,2,42,60,2,42,60,4,42,60,2,42,60,2
1010 DATA 42,60,4,42,60,2,50,58,2,33,134,3,37,161,1
1020 DATA 42,60,8,44,191,2,44,191,2,44,191,3,44
1030 DATA 191,1,44,191,2,42,60,2,42,60,3,42,60,1
1040 DATA 42,60,2,37,161,2,37,161,2,42,60,2,37,161,4
1050 DATA 50,58,4,42,60,2,42,60,2,42,60,4,42,60,2
1060 DATA 42,60,2,42,60,4,42,60,2,50,58,2,33,134,3
1070 DATA 37,161,1,42,60,8,44,191,2,44,191,2,44
1080 DATA 191,3,44,191,1,44,191,2,42,60,2,42,60,3
1090 DATA 42,60,1,50,58,2,50,58,2,44,191,2,37,161,2
1100 DATA 33,134,8,25,29,2,42,60,2,37,161,2,33
1110 DATA 134,2,25,29,7,25,29,1,25,29,2,42,60,2
1120 DATA 37,161,2,33,134,2,28,48,8,28,48,2,44,191,2
1130 DATA 42,60,2,37,161,2,31,164,8,50,58,2,50,58,2
1140 DATA 44,191,2,37,161,2,42,60,8,25,29,2,42,60,2
1150 DATA 37,161,2,33,134,2,25,29,7,25,29,1,25
1160 DATA 29,2,42,60,2,37,161,2,33,134,2,28,48,8
1170 DATA 28,48,2,44,191,2,42,60,2,37,161,2,50,58,2
1180 DATA 50,58,2,50,58,3,50,58,1,56,97,2,50,58,2
1190 DATA 44,191,2,37,161,2,33,134,4,50,58,4
```

IBM PC & compatibles*/Jingle Bells

```
10 DIM P(144),D(144)
20 TEMPO=2
29 REM --READ IN SONG DATA (PITCH, DURATION)--
30 FOR I=1 TO 95
40 READ P(I),D(I)
49 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
```


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80 Columns x 24 Lines, Super Hi-Resolution 800 lines Green or Amber Super-Clear "Easy to Read" text with special anti-glare screen! (Ltd. Qty.) List \$249.00

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80 Columns x 24 Lines, Hi-Resolution, crisp clear easy to read text with anti-glare screen! A MUST for word processing. (Ltd. Qty.) List \$199.00

Sale \$89⁹⁵*

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80 Columns x 24 Lines, easy to read up front controls (Ltd. Qty.)

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BEGINNER PROGRAM

```
50 IF I<50 THEN P(I+95)=P(I):D(I+95)=D(I)
60 NEXT I
69 REM --PLAY SONG--
70 FOR I=1 TO 144
79 REM --PLAY A NOTE--
80 SOUND P(I),D(I)*TEMPO
89 REM --TURN OFF NOTE TO PREVENT LEGATO--
90 SOUND 32767,1
100 NEXT I
110 END
999 REM --SONG DATA--
1000 DATA 659,2,659,2,659,4,659,2,659,2
1010 DATA 659,4,659,2,784,2,523,3,587,1
1020 DATA 659,8,698,2,698,2,698,3,698,1
1030 DATA 698,2,659,2,659,3,659,1
1040 DATA 659,2,587,2,587,2,659,2,587,4
1050 DATA 784,4,659,2,659,2,659,4,659,2
1060 DATA 659,2,659,4,659,2,784,2,523,3
1070 DATA 587,1,659,8,698,2,698,2,698,3
1080 DATA 698,1,698,2,659,2,659,3
1090 DATA 659,1,784,2,784,2,698,2,587,2
1100 DATA 523,8,392,2,659,2,587,2,523,2
1110 DATA 392,7,392,1,392,2,659,2
1120 DATA 587,2,523,2,440,8,440,2,698,2
1130 DATA 659,2,587,2,494,8,784,2,784,2
1140 DATA 698,2,587,2,659,8,392,2,659,2
1150 DATA 587,2,523,2,392,7,392,1,392,2
1160 DATA 659,2,587,2,523,2,440,8
1170 DATA 440,2,698,2,659,2,587,2,784,2
1180 DATA 784,2,784,3,784,1,880,2,784,2
1190 DATA 698,2,587,2,523,4,784,4
```

**This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cassette BASIC C1.20 or Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 00.05.00.*

Macintosh w/Microsoft BASIC 2.0/Jingle Bells

```
DIM P(144),D(144)
TEMPO=2
REM --READ IN SONG DATA (PITCH, DURATION)--
FOR I=1 TO 95
  READ P(I),D(I)
REM --NEXT LINE DUPLICATES ONE PART OF SONG--
IF I<50 THEN P(I+95)=P(I):D(I+95)=D(I)
NEXT I
REM --PLAY SONG--
FOR I=1 TO 144
REM --PLAY A NOTE--
  SOUND P(I),D(I)*TEMPO
NEXT I
END
REM --SONG DATA--
DATA 659,2,659,2,659,4,659,2,659,2,659,4,659,2
DATA 784,2,523,3,587,1,659,8,698,2,698,2,698,3
DATA 698,1,698,2,659,2,659,3,659,1,659,2,587,2
DATA 587,2,659,2,587,4,784,4,659,2,659,2,659,4
DATA 659,2,659,2,659,4,659,2,784,2,523,3,587,1
DATA 659,8,698,2,698,2,698,3,698,1,698,2,659,2
DATA 659,3,659,1,784,2,784,2,698,2,587,2,523,8
DATA 392,2,659,2,587,2,523,2,392,7,392,1,392,2
DATA 659,2,587,2,523,2,440,8,440,2,698,2,659,2
DATA 587,2,494,8,784,2,784,2,698,2,587,2,659,8
DATA 392,2,659,2,587,2,523,2,392,7,392,1,392,2
DATA 659,2,587,2,523,2,440,8,440,2,698,2,659,2
DATA 587,2,784,2,784,2,784,3,784,1,880,2,784,2
DATA 698,2,587,2,523,4,784,4
```

TI-99/4A/Jingle Bells

```
10 DIM P(144),D(144)
20 TEMPO=100
29 REM --READ IN SONG DATA (PITCH, DURATION)--
30 FOR I=1 TO 95
40 READ P(I),D(I)
49 REM --NEXT 3 LINES DUPLICATE ONE PART OF SONG--
50 IF I>49 THEN 80
60 P(I+95)=P(I)
70 D(I+95)=D(I)
80 NEXT I
89 REM --PLAY SONG--
90 FOR I=1 TO 144
99 REM --PLAY A NOTE--
100 CALL SOUND(D(I)*TEMPO,P(I),2)
110 NEXT I
120 END
999 REM --SONG DATA--
1000 DATA 659,2,659,2,659,4,659,2,659,2
1010 DATA 659,4,659,2,784,2,523,3,587,1
1020 DATA 659,8,698,2,698,2,698,3,698,1
1030 DATA 698,2,659,2,659,3,659,1
1040 DATA 659,2,587,2,587,2,659,2,587,4
1050 DATA 784,4,659,2,659,2,659,4,659,2
1060 DATA 659,2,659,4,659,2,784,2,523,3
1070 DATA 587,1,659,8,698,2,698,2,698,3
1080 DATA 698,1,698,2,659,2,659,3
1090 DATA 659,1,784,2,784,2,698,2,587,2
1100 DATA 523,8,392,2,659,2,587,2,523,2
1110 DATA 392,7,392,1,392,2,659,2
1120 DATA 587,2,523,2,440,8,440,2,698,2
1130 DATA 659,2,587,2,494,8,784,2,784,2
1140 DATA 698,2,587,2,659,8,392,2,659,2
1150 DATA 587,2,523,2,392,7,392,1,392,2
1160 DATA 659,2,587,2,523,2,440,8
1170 DATA 440,2,698,2,659,2,587,2,784,2
1180 DATA 784,2,784,3,784,1,880,2,784,2
1190 DATA 698,2,587,2,523,4,784,4
```

Tandy Color Computer/Jingle Bells

```
10 DIM P(144),D(144)
20 TEMPO=2
29 REM --READ IN SONG DATA (PITCH, DURATION)--
30 FOR I=1 TO 95
40 READ P(I),D(I)
49 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
50 IF I<50 THEN P(I+95)=P(I):D(I+95)=D(I)
60 NEXT I
69 REM --PLAY SONG--
70 FOR I=1 TO 144
79 REM --PLAY A NOTE--
80 SOUND P(I),D(I)*TEMPO
90 NEXT I
100 END
999 REM --SONG DATA--
1000 DATA 193,2,193,2,193,4,193,2,193,2
1010 DATA 193,4,193,2,204,2,176,3,185,1
1020 DATA 193,8,197,2,197,2,197,3,197,1
1030 DATA 197,2,193,2,193,3,193,1
1040 DATA 193,2,185,2,185,2,193,2,185,4
1050 DATA 204,4,193,2,193,2,193,4,193,2
1060 DATA 193,2,193,4,193,2,204,2,176,3
1070 DATA 185,1,193,8,197,2,197,2,197,3
1080 DATA 197,1,197,2,193,2,193,3
1090 DATA 193,1,204,2,204,2,197,2,185,2
1100 DATA 176,8,147,2,193,2,185,2,176,2
1110 DATA 147,7,147,1,147,2,193,2
1120 DATA 185,2,176,2,159,8,159,2,197,2
1130 DATA 193,2,185,2,170,8,204,2,204,2
1140 DATA 197,2,185,2,193,8,147,2,193,2
1150 DATA 185,2,176,2,147,7,147,1,147,2
1160 DATA 193,2,185,2,176,2,159,8
```




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| Mouse | Yes | No | Yes | Yes |
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| Color | 640 x 200 | 640 x 200 | None | 640 x 200*** |
| Monochrome | 640 x 400 | 720 x 350** | 512 x 342 | 640 x 200*** |
| Color Output | Yes | Optional | None | Yes |
| Number of Colors | 512 | 16 | None | 4096 |
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```
1170 DATA 159,2,197,2,193,2,185,2,204,2
1180 DATA 204,2,204,3,204,1,210,2,204,2
1190 DATA 197,2,185,2,176,4,204,4
```

VIC-20/Jingle Bells

```
10 DIM P(144),D(144)
20 TEMPO=80
29 REM --TURN ON VOLUME FOR ALL VOICES--
30 POKE 36878,12
39 REM --READ IN SONG DATA (PITCH, DURATION)--
40 FOR I=1 TO 95
50 READ P(I),D(I)
59 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
60 IF I<50 THEN P(I+95)=P(I):D(I+95)=D(I)
70 NEXT I
79 REM --PLAY SONG--
80 FOR I=1 TO 144
89 REM --SET PITCH FOR MIDDLE VOICE--
90 POKE 36876,P(I)
99 REM --DELAY FOR NOTE'S DURATION--
100 FOR J=1 TO D(I)*TEMPO
110 NEXT J
119 REM --TURN OFF MIDDLE VOICE TO PREVENT LEGATO--
120 POKE 36876,0
130 NEXT I
140 END
999 REM --SONG DATA--
1000 DATA 231,2,231,2,231,4,231,2,231,2
1010 DATA 231,4,231,2,235,2,225,3,228,1
1020 DATA 231,8,232,2,232,2,232,3,232,1
1030 DATA 232,2,231,2,231,3,231,1
1040 DATA 231,2,228,2,228,2,231,2,228,4
1050 DATA 235,4,231,2,231,2,231,4,231,2
1060 DATA 231,2,231,4,231,2,235,2,225,3
1070 DATA 228,1,231,8,232,2,232,2,232,3
1080 DATA 232,1,232,2,231,2,231,3
1090 DATA 231,1,235,2,235,2,232,2,228,2
1100 DATA 225,8,215,2,231,2,228,2,225,2
1110 DATA 215,7,215,1,215,2,231,2
1120 DATA 228,2,225,2,219,8,219,2,232,2
1130 DATA 231,2,228,2,223,8,235,2,235,2
1140 DATA 232,2,228,2,231,8,215,2,231,2
1150 DATA 228,2,225,2,215,7,215,1,215,2
1160 DATA 231,2,228,2,225,2,219,8
1170 DATA 219,2,232,2,231,2,228,2,235,2
1180 DATA 235,2,235,3,235,1,237,2,235,2
1190 DATA 232,2,228,2,225,4,235,4
```

PROGRAMMING P.S.

Corrections to previous months' programs

Alphabet Soup: Eat (October 1985, page 60)

ADAM: This version works as published, but it contains a superfluous statement. To remove it, change line 10 to read as follows:

```
10 dl = 120: max = 80: sw = 31
```

Atari 400/800, 600/800XL, & 130XE: Please change lines 370 and 400 to read as follows:

```
370 FOR X=PT(S) TO PT(S)+DP-1
400 DX=INT(38/LW):T=INT(RND(1)*DY)+1+WP(C-1,2)
```

IBM PC & compatibles: Please change line 10 to read as follows:

```
10 SCREEN 0,0:KEY OFF
```

Tandy Color Computer & Models III/4 (w/Model III BASIC): Please change SP to SPS in line 400:

```
400 PRINT@ (RP(P,2)-1)*SW+RP(P,1)-1,SPS;
```

VIC-20 w/8K or 16K RAM Cartridge: To improve the placement of text on the screen, change lines 260 and 670 to read as follows:

```
260 DY=INT((DH-2)/DP
```

```
670 PRINT CLS;:NS=CHR$(13)+"SORRY, YOU'RE WRONG!":GOSU B 3500
```

Draw & Print (September 1985, page 64)

IBM PC & compatibles w/printer: There are two IBM versions with identical heads. The one beginning on page 68 is actually the 40-column version.

Tandy Color Computer w/printer: To make the program pause until you've read your printer, add the following line:

```
215 IF INKEY$="" THEN 215
```

Halloween Classic (October 1985, page 52)

ADAM: Please change line 20 to read as follows:

```
20 DIM xy(4,2),h(4,2),m(28,3):fe = 1
```

Personal Balance Sheet (July 1985, page 14)

Tandy Color Computer w/printer: In addition to the modifications given, omit line 370 from the base version. Also, as you may have discovered, the lines containing "PRINT:" are 400, 500, 530, 620, 640, and 660.

Renegade Robot II (August 1985, page 57)

IBM PC w/Color Graphics Adapter & IBM PCjr: In line 700, please change STRIG(0) to STRIG(1):

```
700 IF K$="P" OR STRIG(1)=-1 THEN 110
```

Terminal Tale (September 1985, page 55)

VIC-20: Please add a space before the word PIE in line 510:

```
510 PRINT FS;" PIE, AND FED"
```

Windowmaker (September 1985, page 88)

Atari 400, 800, 600/800XL, & 130XE: Line 10 as published contains an error. This is how it should read:

```
10 FOR I=1536 TO 1640:READ A:POKE I,A:NEXT I
```

Get 'Em (November 1985, page 65)

Commodore 64 & 128 (C 64 mode): Please change line 1000 to read as follows:

```
1000 DATA 156,+,156,+,31,*,31,*,30,$,158,/158,/158,/
```

Tandy Color Computer: Please change lines 90 and 210 to read as follows:

```
90 PRINT "POINTS: +=100 *=250 $=500 /=-100";
```

```
210 PRINT@D,SPS;:D=D+1:P=PEEK(1024+D):IF P<>96 THEN 230
```



WORDCOUNT

BY JOHN JAINSCHIGG AND PAUL DIXON.



Many people who work with words—students, writers, professionals, and others—are often faced with the problem of “writing to size.” As a journalist, for example, I’m often asked to compose, say, 1,500 words on a topic. In the past, I’ve had to apply “rules of thumb” to estimate how my output at various stages in a project compared to the word length required.

My rules of thumb went out the window when I started writing on a word processor. While I was working on a document in memory, it was hard to see how it would size up in final form. Print preview mode helped a little, and, of course, I could always print out the document and make my estimate in normal fashion. But now that the computer had entered my life, I wanted something more accurate than rules of thumb. Unfortunately, my word-processing program didn’t include a word-count feature. Yet the idea of being able to say to an editor: “I know you asked for 1,500 words here, but this piece contains more like 1,507. Do you want me to cut it?” still appealed. It appealed to me so much that I wrote a word-counting program.

VOILA!

Presenting *Wordcount*—a handy little utility that, well . . . counts words. Just give *Wordcount* the name of a text file you’ve saved on disk in ASCII format (see below), and sit back. The program will churn away for a while (sometimes a long while, depending on the length of



your document), then beep and present you with a highly accurate count of how many words you’ve written.

Wordcount uses a simple algorithm for figuring out what constitutes a word and what doesn’t. It recognizes only letters, numbers, and apostrophes as valid components of a word. When it encounters other characters, such as spaces, commas, or hyphens, it assumes it’s reached the end of a word, updates the count by one, and looks for the beginning of the next word.

Wordcount won’t be fooled by special “control” characters embedded in a file. It does tend to treat each component of a mathematical formula as a separate word, so perhaps it

isn’t the right tool for scientists and engineers—but we’ve found *Wordcount* to be far more accurate than any “rule of thumb” for standard English text. Note: to keep things simple, we avoided having *Wordcount* make any judgment about the length of words. “I” (as in me, myself, and . . .) is just as much a word as “egomaniac” in *Wordcount*’s view.

USING THE PROGRAM

To use *Wordcount*, you’ll have to save your word-processed document as an “uncompressed ASCII” file on disk. An ASCII file is a file that looks pretty much like a printed document—it contains normal characters, spaces, and punctuation, plus carriage returns, but normally no other special “control” characters. Some word processors always save documents as ASCII files, and *Wordcount* can work with these files directly. Others save documents in a special “compressed” format to conserve disk space, and *Wordcount* probably won’t work accurately with files of this type. Luckily, however, word processors that use file compression generally include a feature for saving documents in uncompressed ASCII format, too. Different word processors refer to this common file type in different ways—some call it an ASCII file, some a “text” file, others a “list” file. Some, such as *AppleWorks*, let you create an ASCII file by “printing” a file to disk. Check your documentation carefully to learn your program’s method of saving documents in ASCII format.

If you can, you should type in and save *Wordcount* under the same version of DOS your word processor uses. For example, an Apple owner using a ProDOS-compatible word processor should save *Wordcount* under ProDOS, so that *Wordcount* can read directly from the word processor’s text disks. If

your word processor uses a proprietary or unusual DOS that doesn’t work with BASIC, you’ll have to obtain a conversion utility to transfer files from the word processor’s text disks to normal DOS disks that *Wordcount* can access. Sometimes such a utility is included with the word-processing software. If not, one may be available separately from the software manufacturer. If you’re not sure which DOS your word processor uses, try booting the DOS you use with BASIC and getting a directory of one of your word-processing document disks. If the directory looks normal, then the word processor is probably compatible with *Wordcount*.

Wordcount is fairly short, so it should be easy to type in. One warning is in order, however. ADAM, Apple, IBM, Macintosh, and Model III/4 versions of the program contain error-trapping statements of the form ON ERROR (OR ON ERR) GOTO . . . that prevent the program from crashing if you make an input or other error in using it. Unfortunately, these “user-friendly” statements will also prevent normal error messages from appearing while you’re debugging the program after first typing it in. Unless you’re very sure of your typing, leave out the error-trapping statements until the program is fully debugged—then put them in (carefully) to make it fully functional.

The TRAP statements in the Atari version of the program work in a similar manner, and can be troublesome when you’re debugging. However, since certain of these TRAP statements are important to the normal functioning of the program, they should not be omitted. Atari owners should enter the program as carefully as possible, and watch for strange, TRAP-caused effects when running it the first few times. —J.J. →

PRODUCTIVITY PROGRAM

ADAM/Wordcount

```
10 f = 0:d$ = CHR$(4)
20 GOSUB 1000:ONERR GOTO 210
30 PRINT "What is the name of your"
40 INPUT "text file? ";n$
50 IF n$ = "" THEN 20
60 PRINT d$;"open ";n$
70 PRINT d$;"read ";n$
80 GET c$:ch = ASC(c$):GOSUB 1000
90 PRINT " Counting ... please wait."
100 PRINT:PRINT " I'll sound a tone when done."
110 PRINT:PRINT TAB(10);"Words: 0"
120 w = 0:ONERR GOTO 280
130 al = (ch > 64 AND ch < 91) OR (ch > 96 AND ch < 12
3) OR (ch > 47 AND ch < 58) OR ch = 39
140 IF NOT f AND al THEN f = 1
150 IF f AND NOT al THEN w = w+1:f = 0:HTAB 17:VTAB 9:
PRINT w
160 GET c$:ch = ASC(c$):GOTO 130
170 PRINT CHR$(7):IF f THEN w = w+1
180 PRINT "There were about ";w;" words"
190 PRINT "in your text file."
200 PRINT:END
210 PRINT d$;"close ";n$:GOSUB 1000
220 PRINT "Error ";ERRNUM(0);" has occurred."
230 PRINT:PRINT "A new file called ";n$
240 PRINT "has been created."
250 PRINT:INPUT "Do you want it deleted? ";a$
260 IF LEFT$(a$,1) = "y" OR LEFT$(a$,1) = "Y" THEN PRI
NT d$;"delete ";n$
270 GOSUB 1000:GOTO 30
280 PRINT d$;"close ";n$:CLRERR:GOSUB 1000
290 IF ERRNUM(0) = 5 THEN 170
300 PRINT "Error ";ERRNUM(0);" has occurred."
310 PRINT:PRINT "The count cannot continue."
320 STOP
1000 HOME:HTAB 10:PRINT "*WORDCOUNT*"
1010 VTAB 5:RETURN
```

Apple II series w/disk drive/Wordcount

```
10 F = 0:D$ = CHR$(4)
20 GOSUB 1000:ONERR GOTO 240
30 PRINT "What is the name of your"
40 INPUT "text file? ";N$
50 PRINT D$;"LOCK ";N$
60 PRINT D$;"UNLOCK ";N$
70 PRINT D$;"OPEN ";N$
80 PRINT D$;"READ ";N$
90 GOSUB 1000
100 PRINT TAB(8);"Counting ... please wait."
110 PRINT " A tone will sound when I am done."
120 PRINT:PRINT TAB(15);"Words: 0"
130 W = 0:ONERR GOTO 270
140 GET C$:CH = ASC(C$)
150 AL = (CH > 64 AND CH < 91) OR (CH > 96 AND CH < 12
3) OR (CH > 47 AND CH < 58) OR CH = 39
160 IF NOT F AND AL THEN F = 1:GOTO 140
170 IF F AND NOT AL THEN W = W+1:F = 0:HTAB 22:VTAB 8:
PRINT CHR$(0);W
180 GOTO 140
190 FOR I = 1 TO 100:A = PEEK(-16336):NEXT I
200 IF F THEN W = W+1
210 PRINT "There were about ";W;" words"
220 PRINT "in your text file."
230 POKE 216,0:PRINT:END
240 GOSUB 1000:PRINT D$;"CLOSE ";N$
250 PRINT "Error ";PEEK(222);" has occurred."
260 PRINT:GOTO 30
270 GOSUB 1000:PRINT D$;"CLOSE ";N$
280 IF PEEK(222) = 5 THEN 190
290 PRINT "Error ";PEEK(222);" has occurred."
300 PRINT:PRINT "The count cannot continue."
310 POKE 216,0:STOP
1000 HOME:HTAB 15:PRINT "*WORDCOUNT*"
1010 VTAB 5:RETURN
```

Atari 400/800, 600/800XL, & 130XE w/disk drive/Wordcount

```
10 DIM D$(20),NS(20)
20 TRAP 20:D$="D":NS="":GOSUB 1000
30 PRINT "What is the name of your"
40 PRINT "text file";:INPUT NS
50 IF NS(1,1)<>"D" OR (NS(2,2)<>": " AND NS(3,3)<>":")
THEN D$(3)=NS:GOTO 70
60 D$=NS
70 TRAP 230:OPEN #1,4,0,D$
80 GOSUB 1000:PRINT "Counting ... please wait."
90 PRINT "A tone will sound when I am done."
100 POKE 752,1:PRINT :PRINT "Words: 0"
110 W=0:TRAP 260
120 GET #1,CH
130 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
140 IF NOT F AND AL THEN F=1:GOTO 130
150 IF F AND NOT AL THEN W=W+1:F=0:POSITION 9,8:PRINT
W
160 GOTO 120
170 IF F THEN W=W+1
180 FOR I=1 TO 3:FOR J=15 TO 0 STEP -1
190 SOUND 0,121,10,J:NEXT J:NEXT I
200 PRINT "There were about ";W;" words"
210 PRINT "in your text file."
220 POKE 752,0:PRINT :END
230 CLOSE #1:TRAP 20:GOSUB 1000
240 PRINT "Error ";PEEK(195);" has occurred."
250 PRINT :GOTO 30
260 CLOSE #1:TRAP 40000:GOSUB 1000
270 IF PEEK(195)=136 THEN 170
280 POSITION 2,12:PRINT CHR$(253);
290 PRINT "Error ";PEEK(195);" has occurred."
300 PRINT :PRINT "The count cannot continue."
310 POKE 752,0:STOP
1000 PRINT CHR$(125):POSITION 14,0:PRINT "*WORDCOUNT*"
1010 POSITION 2,5:RETURN
```

Commodore 64 & 128 (C 64 mode) w/disk drive/Wordcount

```
10 S=54272:FOR I=0 TO 24
20 POKE S+I,0:NEXT I:POKE S+24,15
30 POKE S+5,68:POKE S+6,68:POKE S,97:POKE S+1,8
40 F=0:GOSUB 1000
50 PRINT "WHAT IS THE NAME OF YOUR"
60 INPUT "TEXT FILE";N$
70 OPEN 15,8,15:OPEN 5,8,5,N$+"S,R"
80 INPUT#15,E,ER$:IF E<>0 THEN 260
90 GOSUB 1000:PRINT TAB(7);"COUNTING ... PLEASE WAIT."
100 PRINT:PRINT " A TONE WILL SOUND WHEN I AM DONE."
110 PRINT:PRINT TAB(14);"WORDS: 0"
120 W=0
130 GET#5,C$:IF ST=64 THEN 200
140 INPUT#15,E,ER$:IF E<>0 THEN 280
150 CH=ASC(C$)
160 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
170 IF NOT F AND AL THEN F=-1:GOTO 130
180 IF F AND NOT AL THEN W=W+1:F=0:POKE 214,8:PRINT:PR
INT TAB(20);W
190 GOTO 130
200 CLOSE 5:CLOSE 15:IF F=-1 THEN W=W+1
210 POKE S+4,33:FOR J=1 TO 400
220 NEXT J:POKE S+4,0:GOSUB 1000
230 PRINT TAB(7);"THERE WERE ABOUT";W
240 PRINT TAB(7);"WORDS IN YOUR TEXT FILE."
250 PRINT:END
260 CLOSE 5:CLOSE 15:GOSUB 1000
270 PRINT ER$;".":PRINT:GOTO 50
280 CLOSE 5:CLOSE 15:GOSUB 1000
290 PRINT ER$;".":PRINT
300 PRINT "THE COUNT CANNOT CONTINUE."
310 STOP
1000 PRINT CHR$(147):PRINT TAB(13);"*WORDCOUNT*"
1010 POKE 214,4:PRINT:RETURN
```


Design

TOWNS

Map Skills for Ages 6 to 9



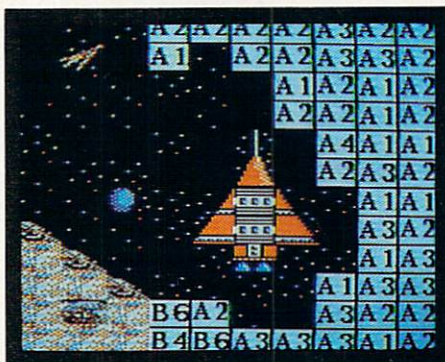
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Middletown, CT 06457

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A/MS43

& Build

CIRCLE READER SERVICE 58

IBM PC & compatibles* w/disk drive/Wordcount

```

10 KEY OFF
20 WIDTH 40:GOSUB 1000
30 PRINT "What is the name of your"
40 INPUT "text file";N$
50 ON ERROR GOTO 210:OPEN N$ FOR INPUT AS 1
60 GOSUB 1000:PRINT TAB(8);"Counting ... please wait."
70 PRINT TAB(4);"A tone will sound when I am done."
80 LOCATE 8,15,0:PRINT "Words: 0"
90 W=0:ON ERROR GOTO 240
100 IF EOF(1) THEN 160
110 CH=ASC(INPUT$(1,1))
120 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<48) OR CH=39
130 IF NOT F AND AL THEN F=-1:GOTO 100
140 IF F AND NOT AL THEN W=W+1:F=0:LOCATE 8,21:PRINT W
150 GOTO 100
160 CLOSE 1:IF F THEN W=W+1
170 SOUND 500,20:GOSUB 1000
180 PRINT "There were about";W;"words"
190 PRINT "in your text file."
200 ON ERROR GOTO 0:PRINT:END
210 CLOSE 1:GOSUB 1000
220 PRINT "Error";ERR;"has occurred."
230 PRINT:RESUME 30
240 CLOSE 1:GOSUB 1000
250 PRINT "Error";ERR;"has occurred."
260 PRINT:PRINT "The count cannot continue."
270 ON ERROR GOTO 0:STOP
1000 CLS:PRINT TAB(15);"*WORDCOUNT*"
1010 PRINT:PRINT:RETURN
    
```

**This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 00.05.00.*

Macintosh w/Microsoft BASIC 2.0/Wordcount

```

F=0
GOSUB HEAD
GETNAME:
INPUT "What is the name of your text file";N$
ON ERROR GOTO OPENERR
OPEN N$ FOR INPUT AS 1
GOSUB HEAD
PRINT TAB(20);"Counting ... please wait."
PRINT TAB(16);"A tone will sound when I am done."
PRINT:PRINT TAB(26);"Words: 0"
W=0:ON ERROR GOTO READERR
WHILE NOT EOF(1)
  CH=ASC(INPUT$(1,1))
  AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (C
H>47 AND CH<58) OR CH=39
  IF NOT F AND AL THEN F=-1
  IF F AND NOT AL THEN W=W+1:F=0:LOCATE 8,31:PRINT
W
WEND
IF F THEN W=W+1
CLOSE 1:SOUND 500,5:GOSUB HEAD
PRINT "There were about";W;"words in your text fil
e."
ON ERROR GOTO 0:PRINT:END
OPENERR:
CLOSE 1:GOSUB HEAD
PRINT "Error";ERR;"has occurred."
PRINT:RESUME GETNAME
READERR:
CLOSE 1:GOSUB HEAD
PRINT "Error";ERR;"has occurred."
PRINT:PRINT "The count cannot continue."
ON ERROR GOTO 0:STOP
HEAD:
CLS:PRINT:PRINT TAB(25);"*WORDCOUNT*"
PRINT:PRINT:RETURN
    
```

Tandy Color Computer w/disk drive & Disk Extended Color BASIC/Wordcount

```

10 GOSUB 1000
20 PRINT "WHAT IS THE NAME OF YOUR"
30 INPUT "TEXT FILE";N$
40 OPEN "D",#1,N$,1
50 FIELD#1,1 AS C$
60 GOSUB 1000:PRINT TAB(4);"COUNTING ... PLEASE WAIT."
70 PRINT:PRINT "I'LL SOUND A TONE WHEN I'M DONE."
80 PRINT TAB(11);"WORDS: 0"
90 W=0:FOR I=1 TO LOF(1)
100 GET#1,I:CH=ASC(C$)
110 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
120 IF NOT F AND AL THEN F=-1
130 IF F AND NOT AL THEN W=W+1:F=0:PRINT@241,W
140 NEXT I
150 IF F THEN W=W+1
160 CLOSE#1:GOSUB 1000
170 SOUND 200,10
180 PRINT "THERE WERE ABOUT";W;"WORDS"
190 PRINT "IN YOUR TEXT FILE."
200 PRINT:END
1000 CLS:PRINT TAB(10);"*WORDCOUNT*"
1010 PRINT:PRINT:RETURN
    
```

Tandy Models III & 4 (Model III mode) w/disk drive/Wordcount

```

10 CLEAR 1000:F=0
20 GOSUB 1000
30 INPUT "What is the name of your text file";N$
40 ON ERROR GOTO 210
50 OPEN "I",1,N$
60 GOSUB 1000
70 PRINT TAB(15);"Counting ... please wait."
80 PRINT:PRINT TAB(23);"Words: 0"
90 ON ERROR GOTO 240
100 LINE INPUT#1,C$
110 IF C$="" THEN 160 ELSE CH=ASC(C$)
120 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
130 IF NOT F AND AL THEN F=-1
140 IF F AND NOT AL THEN W=W+1:F=0:PRINT@349,W
150 IF LEN(C$)>1 THEN C$=RIGHT$(C$,LEN(C$)-1):GOTO 110
160 IF NOT EOF(1) THEN 100
170 IF F THEN W=W+1
180 CLOSE 1:GOSUB 1000
190 PRINT "There were about";W;"words in your text fil
e."
200 CLOSE 1:ON ERROR GOTO 0:PRINT:END
210 CLOSE 1:GOSUB 1000
220 PRINT "Error";ERR/2+1;"has occurred."
230 PRINT:RESUME 30
240 CLOSE 1:GOSUB 1000
250 PRINT "Error";ERR/2+1;"has occurred."
260 PRINT:PRINT "The count cannot continue."
270 ON ERROR GOTO 0:STOP
1000 CLS:PRINT TAB(22);"*WORDCOUNT*"
1010 PRINT:PRINT:RETURN
    
```

COMPUTERS WE COVER

We regularly present two or more programs in each issue for the Apple II series; Atari 400/800, 600/800XL, & 130XE; Commodore 64 & 128; IBM PC & compatibles; Macintosh; and Tandy Models III/4 & Color Computer. In addition, we publish at least one program each issue for the ADAM, TI-99/4A, and VIC-20. In the coming months, we also hope to cover the Atari 520ST and the Amiga.

These programs can be found here in The Programmer and in the Microtones and Compucopia portions of the K-POWER section of FAMILY COMPUTING.

1200 Baud Smart Duck

If it walks like a duck, sounds like a duck, and looks like a duck, it darn well better act like a duck. And ADC's new Hayes Compatible 1200 baud auto-answer/auto-dial modem is one heck of a duck. And, it's a market buster at just \$169.

By Drew Kaplan

Hats off to Hayes. They've just about written the book on specs and protocol for the 1200 baud modem market.

Every professional modem bills itself as 'Hayes Compatible'. But the big question is, how much does it really cost to make a top-of-the-line 1200 baud modem? Or, who's getting rich?

ADC's modem is made in the same factory by the same people as one of Hayes's biggest competitors. And, ADC is a division of BSR, the enormous half-billion dollar electronics giant.

So for \$169, you'll not only be getting a duck that quacks properly to Hayes modems, but sings like a nightingale to your pocketbook and can save you a fortune in time with its extra features.

DUCK SOUP

Any computer with an RS232 standard serial port, will work flawlessly with this modem. And, virtually any modem or terminal software that's compatible with Hayes, will be compatible with ADC.

We've even got intelligent programs, cables, and interfaces (if you need them) to activate your IBM PC or Clone, and your Apple IIE or IIC.

I've owned a Hayes 1200 baud modem for about 2 years. I just unplugged it and plugged in ADC's to operate my Hewlett-Packard dumb terminal which I use at home to monitor DAK's computer.

The only differences I noted were improved monitor sound, more screen displays and a help menu. And oh yes, one last extra. I use a few local data bases whose phone lines are always busy.

Well, ADC's intelligent modem recognizes a busy signal, hangs up and keeps retrying the number every 30 seconds.

There are less important (to me) extras like day, date and time, an extra phone jack and auto tone/pulse switching. So, you'll love it for discount services.

DO YOU NEED TO KNOW?

Just think, you can transform your PC into a terminal that can interact with main-frames. You can download information from your main office computer and run Lotus, Wordstar or you name it. It's all possible with your PC and modem.

You can exchange information with other computers. Say you're a writer, you can send a chapter from your home or office in Los Angeles to New York, have it edited and sent back to you.

You can even send it directly to typesetters and have a book or a newsletter prepared from your transmitted file.

It's really great when drafts of contracts are flying back and forth. Why retype everything over and over again?

Electronic mail lets you type in your message and you won't have to worry about playing telephone tag any longer.

You can get the weather in Baltimore, get the latest quote on your company's stock, or even reserve a seat on the next flight to Las Vegas. You can upload public domain software (there's an enormous amount of free software) or sample the newest programs before you buy.

There are pay data bases like Com-



puServe and The Source that have information about anything, and thousands of free bulletin boards about everything from Ham Radio to Parapsychology.

There's even a new book that lists and describes such diverse data bases as one with 6500 references about coffee, to one with 2,000,000 on agriculture.

Of course, economics, medicine, law and computers are all well represented.

THE TECHNICAL SIDE OR, WHY 1200 BAUD?

The ADC Modem will communicate at 1200 baud (about 120 characters per second) or 300 baud (about 30 characters per second) automatically, depending on the link at the other end.

So, it's clearly a decision of money and time. 1200 baud is roughly 400% faster than 300 baud, so if you transfer data across the country you save 400% on your phone bill. And think of the time \$169 can save you!

If you download material from pay data bases, even though some charge more for 1200 baud, you still come out way ahead because of the amount of information you get per dollar.

It comes with a modular phone cord that you simply connect to any standard modular jack and it uses standard Bell 103 and 212A protocols. It operates in half or full duplex.

Its built-in microprocessors let you automatically answer in-coming data calls and act on all Hayes commands.

It even waits for dial tones and phone network tones during auto-dial. The modem is 9½" X 5½" X 2". It's backed by ADC's standard 1 year limited warranty.

HOOKING IT UP MADE EASY

All you need is a serial output, a cable and a modem program. All our modem programs on disk let you save, upload and download files. Look how easy it is.

If you own an IBM PC or a clone, usually you'll find an RS232 serial port already built-in. All you need is our cable and modem program on disk which we've packaged together for just \$29 plus \$3 P&H. But, before you order your cable, you may need a short sex education course.

Sex Education 1A. You need to determine whether your computer's RS232 connector is male or female.

If you look at the picture below this paragraph, you will note that the connector has holes going in. It's a female. If it had copper pins sticking out, it would be a male. Now wasn't that simple?



So, if yours is female, order our male cable and modem program Or. No. 4353. If you have male pins sticking out, order our female cable, Order No. 4354.

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For your Apple IIC, your serial interface is built-in. All you need is our cable and modem program on disk. They are just \$29.90 (\$3 P&H) Order No. 4356.

For your Apple IIE, you'll need a serial interface with an RS232 port, a cable and a modem program. It's all yours for just \$89 (\$4 P&H) Order No. 4357.

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For business or pleasure, you'll communicate, gather information and save time. If you aren't 100% satisfied, simply return it in its original box to DAK within 30 days for a courteous refund.

To Order Your ADC 1200 Baud Intelligent Modem risk free with your credit card, call toll free, or send your check for DAK's market busting price of just \$169 plus \$6 P&H. Order No. 4334.

The OnLine Directory of over 1,100 Data bases, complete with descriptions is just \$14.95 (\$2 P&H) Order No. 4358.

The ducks will sure to be quacking up a storm when they see BSR's factory direct, through DAK, price on this state-of-the-art 1200 baud intelligent modem.

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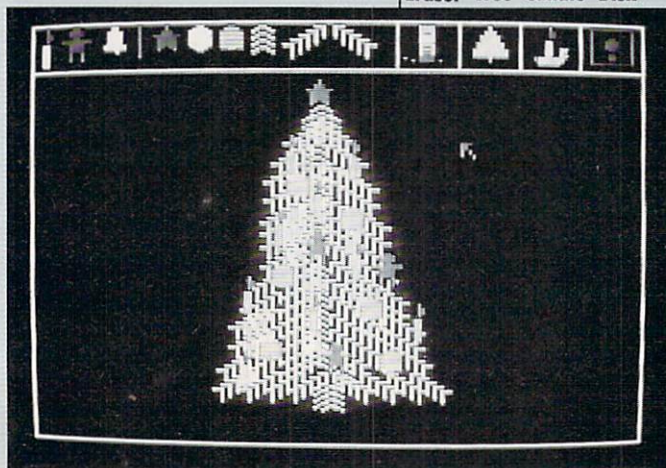
CHRISTMAS TREE CONSTRUCTION SET

BY JOHN JAINSHIGG

Drawing Icons

Special Function Icons

Large
Eraser Tree Candle Disk



There's nothing like an evergreen tree covered with candles and decorations to fill a house with holiday cheer. In many homes, it's traditional to trim the tree together.

This month's Holiday Program lets your family create its own version of the "perfect" tree and decorate it—and redecorate it—right on your computer screen. You can let your Christmas creativity run wild: Create trees of different shapes and sizes, build wreaths, and generally "deck the halls" to your heart's content. Each family member can save his or her best work on disk, so you can display a different tree every day. These trees don't need to be watered and never lose their needles—and you don't have to rearrange the furniture to set them up!

USING THE PROGRAM

Christmas Tree Con-

struction Set, like the commercial "construction set" programs on which it's modeled, lets you use a joystick to select small pictures, or "icons" (an ornament or a piece of tinsel, for example), and place them on the screen to form parts of a larger picture. Across the top of the screen you'll see the ten images you can choose from, including evergreen boughs of various shapes and sizes. To the right are four boxes containing icons for special functions you can perform.

To draw on the screen, you use the joystick to move the cursor (a little arrow) to the icon you want. Then press the joystick button. The cursor disappears, and when you move the joystick, a copy of the icon moves with it. When you've positioned the icon where you want it in the drawing area, press the button again, and a copy

of the icon you are "holding" will be "stamped" on the screen. You can then move the icon and "stamp" it elsewhere in the drawing area, or you can return to the top of the screen and select a different icon.

To use one of the special functions, move the cursor to the box for that function and press the button. The eraser icon lets you clean up mistakes on the drawing screen. Just move the eraser over the area you wish to erase while holding down the button. The "crossed-out tree" is for clearing the entire drawing screen and starting over; use it with caution. The large candle is for special effects: selecting it will cause certain ornaments to glimmer and glow, and will play a tune to round out the cheery mood. Press the button again to continue drawing.

The disk icon is for **SAVE**ing and **LOAD**ing your creations to and from disk. When you select it, you'll see another screen, where you'll be asked to enter an appropriate command and filename (don't worry—your picture is still safe until you actually **LOAD** another one over it). If you decide you don't want to **SAVE** or **LOAD** a picture, just press **RETURN** or **ENTER** at the command prompt and you can continue drawing.

The simplicity of *Christmas Tree Construction Set* makes using it an ideal holiday pastime for young children, since it's easy to produce attractive results without a great deal of coordination and skill. Kids will be pleased at the quality of the designs they can create and will enjoy **SAVE**ing them and showing them off to others.

Atari 400, 800, 600/800XL, & 130XE w/48K RAM/ w/joystick & disk drive/Christmas Tree Construction Set

```

10 POKE 106,144:GRAPHICS 8+16
20 DIM M(46,3),BT(4),HD(22),IV(6)
30 DIM ICON$(433),MASK$(433),QS(60),CK$(60)
40 DIM FS(20),DS(20),CMS(20),TS(20)
50 MASK$=CHR$(0):MASK$(433)=MASK$:MASK$(2)=MASK$
60 SC=PEEK(88)+256*PEEK(89):CI=1552:LN=6000:GRAPHICS 0
70 FOR I=0 TO 15:READ DS:HD(ASC(DS)-48)=I:NEXT I
80 FOR I=1 TO 15:FOR J=1 TO 3:GOSUB 3000
90 M(I,J)=V:M(I+15,J)=V:NEXT J:NEXT I
100 FOR I=31 TO 46:FOR J=1 TO 3:GOSUB 3000
110 M(I,J)=V:NEXT J:NEXT I
120 FOR I=1 TO 15:FOR J=1 TO 6:GOSUB 3000
130 IV(J)=V:NEXT J
140 V=SC+IV(5)+IV(6)*40:GOSUB 1000
150 POKE CI,L:POKE CI+1,H
160 V=ADR(ICON$)+LEN(ICON$):GOSUB 1000
170 POKE CI+2,L:POKE CI+3,H
180 V=ADR(MASK$)+LEN(ICON$):GOSUB 1000
190 POKE CI+4,L:POKE CI+5,H
200 POKE CI+6,IV(2):POKE CI+7,IV(3)
210 POKE CI+8,IV(2)*IV(3):POKE CI+9,IV(4)
220 POKE CI+10,IV(5):POKE CI+11,IV(6):CI=CI+16
230 FOR J=1 TO IV(1):GOSUB 3000:NB=V
240 FOR K=1 TO IV(2):GOSUB 3000:BT(K)=V:NEXT K
250 FOR L=1 TO NB:FOR K=1 TO IV(2)
260 ICON$(LEN(ICON$)+1)=CHR$(BT(K))
270 NEXT K:NEXT L:NEXT J:NEXT I
280 FOR I=38656 TO 39750:GOSUB 3000:POKE I,V:NEXT I
290 IF SM=141641 THEN 320
300 PRINT "I HAVE FOUND AN ERROR."
310 PRINT "PLEASE CHECK YOUR DATA STATEMENTS.":STOP
320 A=USR(38848,LEN(ICON$),ADR(MASK$),ADR(ICON$))
330 GRAPHICS 2:SETCOLOR 2,0,0:POKE 752,1
340 POSITION 2,2:PRINT #6;"FAMILY COMPUTING"
350 POSITION 3,4:PRINT #6;"christmas tree"
360 POSITION 2,5:PRINT #6;"construction set"
370 PRINT " PRESS JOYSTICK BUTTON TO BEGIN."
380 GOSUB 2010
390 GRAPHICS 8+16:A=USR(38688):POKE 708,69
400 FOR IC=1 TO 15

```


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HOLIDAY PROGRAM

```

410 A=USR(39084,IC):A=USR(39140):NEXT IC:A=USR(39110)
420 A=USR(39148):X=PEEK(1546)
430 IF X=23 OR X=27 OR X=31 OR X=35 OR X=39 THEN 420
440 IF X>27 THEN FC=INT((X-27)/4):GOTO 500
450 IF X>23 THEN IC=1:GOTO 480
460 IF X>16 THEN IC=INT((X-16)/4)+13:GOTO 480
470 IC=INT(X/2)+5
480 FOR I=15 TO 0 STEP -1:SOUND 0,50,10,I:NEXT I
490 A=USR(39131):A=USR(39084,IC):A=USR(39122):GOTO 420
500 IF FC=0 THEN 390
510 IF FC=1 THEN GOSUB 2000:GOTO 420
520 A=USR(39131)
530 DLL=PEEK(560):DLH=PEEK(561)
540 SPL=PEEK(88):SPH=PEEK(89)
550 DMA=PEEK(559):POKE 559,0
560 POKE 87,0:POKE 88,0:POKE 89,146
570 POKE 560,0:POKE 561,151:POKE 559,DMA:POKE 106,150
580 PRINT CHR$(125);
590 PRINT "PLEASE ENTER ";CHR$(34);"SAVE";
600 PRINT CHR$(34);" OR ";CHR$(34);"LOAD";CHR$(34)
610 PRINT "AND FILENAME, OR JUST PRESS"
620 PRINT "<RETURN> TO CONTINUE DRAWING."
630 INPUT F$:IF F$="" THEN 750
640 IF LEN(F$)<6 THEN 660
650 CMS=F$(1,5):IF CMS="SAVE " OR CMS="LOAD " THEN 670
660 PRINT CHR$(125);"PLEASE RE-ENTER.":PRINT GOTO 590
670 F$=F$(6,LEN(F$)):F$(LEN(F$)+1)=CHR$(155):D$="D:"
680 IF LEN(F$)<3 THEN D$(3)=F$:F$=D$:GOTO 700
690 IF F$(1,1)<>"D" OR (F$(2,2)<>" " AND F$(3,3)<>" "):
    THEN D$(3)=F$:F$=D$
700 CM=8:IF CMS="LOAD " THEN CM=4
710 TRAP 730:A=USR(38939,CM,ADR(F$),SC+880,6800)
720 TRAP 40000:POKE 195,A:IF A=0 THEN 750
730 CLOSE #2:PRINT CHR$(125);
740 PRINT "ERROR ";PEEK(195);" HAS OCCURRED.":GOTO 590
750 POKE 559,0
760 POKE SC,255:POKE 87,7:POKE 88,SPL:POKE 89,SPH
770 POKE 560,DLL:POKE 561,DLH:POKE 559,DMA
780 POKE 106,144:A=USR(39140):GOTO 420
    
```

```

1000 H=INT(V/256):L=V-H*256:RETURN
2000 POKE 54286,192
2010 MP=1:FOR DL=1 TO 10:NEXT DL
2020 D=0:SOUND 0,M(MP,1),10,10:SOUND 1,M(MP,2),10,10
2030 IF NOT STRIG(0) THEN 2050
2040 IF D<M(MP,3)*10 THEN D=D+1:GOTO 2030
2050 SOUND 0,0,0,0:SOUND 1,0,0,0
2060 IF STRIG(0) THEN 2080
2070 POKE 54286,64:FOR DL=1 TO 20:NEXT DL:RETURN
2080 MP=MP+1-46*(MP=46):GOTO 2020
3000 IF LEN(Q$)<=1 THEN GOSUB 4000
3010 V=ASC(Q$(1,1)):Q$=Q$(2,LEN(Q$)):RETURN
4000 CK$="":FOR HB=1 TO 4:READ T$
4010 CK$(LEN(CK$)+1)=T$:NEXT HB
4020 READ CS:PRINT "NOW PROCESSING DATA IN LINE ";LN
4030 QS=0:FOR PZ=1 TO LEN(CK$)-1 STEP 2
4040 DV=HD(ASC(CK$(PZ,PZ))-48)*16+HD(ASC(CK$(PZ+1,PZ+1))-48)
4050 QS=(LEN(Q$)+1)=CHR$(DV):QS=QS+DV:NEXT PZ
4060 IF QS<>CS THEN PRINT "THERE IS AN ERROR IN LINE "
    ;LN:STOP
4070 SM=SM+CS:LN=LN+10:RETURN
5000 DATA 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F
6000 DATA 5151033C,60023C60,013C6003,3551032F,823
6010 DATA 3C022F44,012F4803,2F390335,35022F39,619
6020 DATA 012D3503,40510335,40033C3C,03282F03,583
6030 DATA 282F022F,35012339,03282F03,282F022D,509
6040 DATA 35012D35,032D3903,2D350235,4001282F,565
6050 DATA 032D3503,2D35022F,3C012F3C,03030110,442
6060 DATA 0019020B,5501FF04,550E0310,001C0202,533
6070 DATA 00080001,102A0101,142A0501,05AA9401,461
6080 DATA 016A5001,00594001,00958001,0295A001,932
6090 DATA 02596001,016A5001,05AA9401,16AAA501,1058
6100 DATA 10040102,00040009,03100020,02020004,95
6110 DATA 00030005,00010000,0003003C,0001003C,133
6120 DATA 2802003C,2401003C,280206AA,A00102AA,750
6130 DATA 80090310,02240201,55555503,40000101,521
6140 DATA 40140104,40550101,40140101,40000103,394
6150 DATA 40140101,40000101,55555505,01110400,434
    
```



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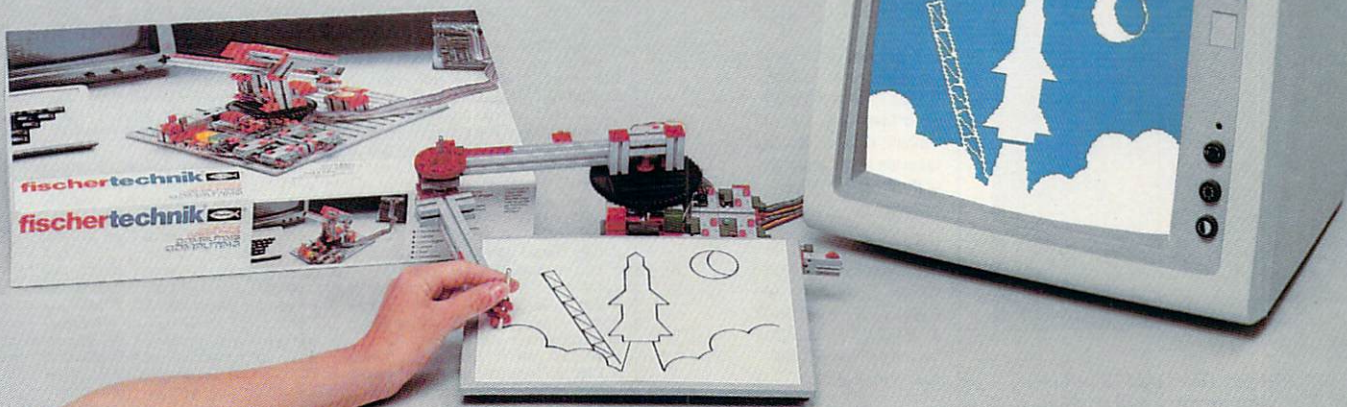
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CIRCLE READER SERVICE 22

6160 DATA 02020403,05010401,000A3C06,020F0002,117
 6170 DATA 02010140,03055001,01400255,55040550,483
 6180 DATA 04041004,020B0404,0202030C,060FF002,511
 6190 DATA 3FFC0100,8001010E,0007020E,4007020B,567
 6200 DATA 00080202,01000205,40015554,01155003,359
 6210 DATA 15500114,50011010,05020B00,0A020103,269
 6220 DATA C0010FF0,073FFC01,0FF00103,C00B020B,1246
 6230 DATA 000C0201,0140010F,F0011554,013FFC01,759
 6240 DATA 1554013F,FC011554,013FFC01,1554013F,1013
 6250 DATA FC010140,0C020C00,0E020102,80010820,532
 6260 DATA 01200801,02800108,20012008,01028001,386
 6270 DATA 08200120,08010280,01082001,20080C03,309
 6280 DATA 0E001002,0100002A,01000002,010002A2,243
 6290 DATA 01000022,01002A22,01000022,0102A220,344
 6300 DATA 01002220,012A2200,01022200,02022000,217
 6310 DATA 02020000,0C030E00,140201A8,00000180,353
 6320 DATA 0000018A,80000188,00000188,A8000108,718
 6330 DATA 80000108,8A800108,88000100,88A80100,854
 6340 DATA 88800200,08800200,00800702,08001432,619
 6350 DATA 01FF0002,EA0001EC,0001EB00,01E2C001,1385
 6360 DATA E0B00100,20707070,42009202,02020202,991
 6370 DATA 02020202,02020202,02020202,02020202,32
 6380 DATA 02024100,9768AD2F,0248A900,8D2F0218,1001
 6390 DATA AD300269,0385CBAD,31026900,85CCA017,1516
 6400 DATA A98F91CB,A000B1CB,C941F00D,29FE91CB,2362
 6410 DATA C94ED002,C8C8C8D0,ED688D2F,02A90785,2137
 6420 DATA 57A55885,CB85CFA5,5985CC85,D0A2BFA0,2461
 6430 DATA 00A9C091,CBE0AB90,12A017A9,0C91CBA0,2138
 6440 DATA 1B91CBA0,1F91CBA0,2391CBA0,27A90391,1973
 6450 DATA CB18A5CB,692885CB,A5CC6900,85CCE0AB,2282
 6460 DATA D008A5CB,85CD A5CC,85CECAD0,C2A027A9,2602
 6470 DATA FF91CB91,CD91CF88,10F7A99E,8D0002A9,2343
 6480 DATA 988D0102,6068A205,6895CB68,CA95CBCA,1979
 6490 DATA 10F6A000,A207B1CB,3D1398D0,0CA5D11D,1826
 6500 DATA 139885D1,CACA4CED,97CAA5D1,3D139885,2322
 6510 DATA D1CA10E2,A5D191CD,E6CB0002,E6CCE6CD,2889
 6520 DATA D002E6CE,C6CF0004,A5D0F00B,A5CF09F,2715
 6530 DATA D0C2C6D0,1890BD60,FC03F30C,CF303FC0,2281
 6540 DATA 68A2078E,9D98689D,9598CA10,F9A220CE,2153

6550 DATA 9D98AC9D,98B99598,9D4A03A9,009D4B03,1914
 6560 DATA 88B99598,9D450388,B995988C,9D989D44,2147
 6570 DATA 03A9039D,42032056,E43038BD,4A030903,1129
 6580 DATA 9D4203AC,9D9888B9,95989D45,0388B995,2028
 6590 DATA 989D4403,88B99598,9D490388,B995989D,2014
 6600 DATA 48032056,E4300CA9,0C9D4203,2056E430,1282
 6610 DATA 02A000A9,0085D584,D4600000,00000000,1117
 6620 DATA 00000148,8D0AD4AD,9AD2090C,8D16D068,1325
 6630 DATA 40686868,8D0C060A,0A0A0A8A,A200B900,1090
 6640 DATA 069D0006,C8E8E00C,D0F46068,A200A900,1820
 6650 DATA 9D479CCA,D0FA6068,A90185D1,20A89960,2205
 6660 DATA 68A90085,D120A899,60682083,99205E99,1763
 6670 DATA 6068AD78,028D0E06,C90FD034,AD0D06D0,1532
 6680 DATA F1AD8402,D0ECAD0B,06C916B0,06A9018D,1898
 6690 DATA 0D0660AD,0C06C901,D00C2083,9920D398,1439
 6700 DATA 205E994C,ED98C90F,F0C82003,98A90085,2260
 6710 DATA A9008D0D,0620DC98,20039AAD,0B06C916,1335
 6720 DATA 9018AD0C,06C901D0,11AD8402,D00C2083,1476
 6730 DATA 9920D398,205E994C,ED9820D3,9820E598,2100
 6740 DATA 4CED98AD,020685CB,AD030685,CC9A0085,1803
 6750 DATA D120FF9A,AD0906F0,07A90085,D120239B,1818
 6760 DATA A90385D1,20A89960,AD040685,CBAD0506,1666
 6770 DATA 85CCA9FF,85D120FF,9AAD0906,F007A901,2149
 6780 DATA 85D12023,9BA90285,D120A899,60AD0006,1705
 6790 DATA 85CBAD01,0685CCA2,00AD0706,85D0A000,1702
 6800 DATA A5D1D008,BD479C91,CB4CE899,C901D008,2233
 6810 DATA B1CB9D47,9C4CE899,C902D00A,BD479B31,2110
 6820 DATA CB91CB4C,E899BD47,9B11CB91,CBE8C8CC,2631
 6830 DATA 060630CC,F0CA18A5,CB692885,CBA5CC69,2053
 6840 DATA 0085CC66,D0D0B760,6E0E06B0,246E0E06,1702
 6850 DATA 20B29AAD,0B06C901,F03BCE0B,0638AD00,1507
 6860 DATA 06E9288D,0006AD01,06E9008D,01064C50,1143
 6870 DATA 9A6E0E06,B01F38A9,CBEED706,CD0B06F0,1618
 6880 DATA 14EE0B06,18AD0006,69288D00,06AD0106,950
 6890 DATA 69008D01,066E0E06,B02AAD0A,06C900F0,1231
 6900 DATA 55CE0906,CE0906AD,0906C9FE,D048A906,1625
 6910 DATA 8D0906CE,0A06CE00,06AD0006,C9FD036,1487
 6920 DATA CE010660,6E0E06B0,2D20BA9A,38A927ED,1533
 6930 DATA 0606CD0A,06F01F90,1DEE0906,EE0906AD,1356

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HOLIDAY PROGRAM

```

6940 DATA 0906C908,D010A900,8D0906EE,0A06EE00,1265
6950 DATA 06D003EE,010660AD,0B06C916,F01060AD,1496
6960 DATA 0B06C916,900160AD,0A06C91B,9007AD0C,1234
6970 DATA 06C90FD0,0160AD00,0648AD01,0648AD0A,1213
6980 DATA 0648AD0B,0648AD09,0648A90F,20AF9868,1247
6990 DATA 8D090668,8D0B0668,8D0A0668,8D010668,1035
7000 DATA 8D000660,A20AD07,0685CFA0,00AD0606,1276
7010 DATA 85D0B1CB,9D479BE8,C8C6D0D0,F5A5D19D,2926
7020 DATA 479BE8C6,CFD0E660,18AD0806,6D070685,1863
7030 DATA CFAC0906,A5CF85D0,A20038A5,D1D00118,1932
7040 DATA 7E479BE8,C6D0D0F8,88D0E960,00000000,2119
    
```

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```

10 POKE 55,0:POKE 56,92:CLR
20 DIM M(46,5),BT(4),HD(22),IV(6)
30 SC=24576:CI=49168:DI=49841:SN=54272:LN=6000:SM=0
40 FOR I=0 TO 23:POKE SN+I,0:NEXT I
50 POKE SN+24,15:POKE SN+5,10:POKE SN+12,10
60 FOR I=0 TO 15:READ AS:HD(ASC(A$)-48)=I:NEXT I
70 FOR I=1 TO 15:FOR J=1 TO 5:GOSUB 3000:M(I,J)=V
80 M(I+15,J)=M(I,J):NEXT J:NEXT I
90 FOR I=31 TO 46:FOR J=1 TO 5
100 GOSUB 3000:M(I,J)=V:NEXT J:NEXT I
110 FOR I=1 TO 15:FOR J=1 TO 6
120 GOSUB 3000:IV(J)=V:NEXT J
130 V=SC+IV(5)*8+INT(IV(6)/8)*320+(IV(6) AND 7)
140 GOSUB 1000:POKE CI,L:POKE CI+1,H
150 V=DI:GOSUB 1000:POKE CI+2,L:POKE CI+3,H
160 V=DI-433:GOSUB 1000:POKE CI+4,L:POKE CI+5,H
170 POKE CI+6,IV(2):POKE CI+7,IV(3)
180 POKE CI+8,IV(2)*IV(3):POKE CI+9,IV(4)
190 POKE CI+10,IV(5):POKE CI+11,IV(6):CI=CI+16
200 FOR J=1 TO IV(1):GOSUB 3000:NB=V
210 FOR K=1 TO IV(2):GOSUB 3000:BT(K)=V:NEXT K
220 FOR L=1 TO NB:FOR K=1 TO IV(2)
230 POKE DI,BT(K):DI=DI+1
240 NEXT K:NEXT L:NEXT J:NEXT I
250 FOR I=50791 TO 52102:GOSUB 3000:POKE I,V:NEXT I
    
```

```

260 IF SM=201675 THEN 290
270 PRINT "I HAVE FOUND AN ERROR."
280 PRINT "PLEASE CHECK YOUR DATA STATEMENTS.":STOP
290 SYS 51139
300 POKE 53281,0:PRINT CHR$(147):POKE 214,10:PRINT
310 PRINT TAB(10);CHR$(28);"*FAMILY COMPUTING*":PRINT
320 PRINT TAB(4);CHR$(30);"CHRISTMAS TREE CONSTRUCTION SET"
330 POKE 214,23:PRINT
340 PRINT TAB(4);CHR$(28);"PRESS JOYSTICK BUTTON TO BEGIN.":CHR$(154);
350 TW=0:GOSUB 2000
360 SYS 50898:SYS 50791:SYS 50859:SYS 50968
370 FOR I=1 TO 15:SYS 51273,I:SYS 51341:NEXT I
380 SYS 51307
390 SYS 51384:X=PEEK(49162)
400 IF X=23 OR X=27 OR X=31 OR X=35 OR X=39 THEN 390
410 IF X>27 THEN FC=INT((X-27)/4):GOTO 470
420 IF X>23 THEN IC=1:GOTO 450
430 IF X>16 THEN IC=INT((X-16)/4)+13:GOTO 450
440 IC=INT(X/2)+5
450 POKE SN+4,0:POKE SN,0:POKE SN+1,100:POKE SN+4,17
460 SYS 51332:SYS 51273,IC:SYS 51323:GOTO 390
470 IF FC=0 THEN 360
480 IF FC=1 THEN TW=-1:GOSUB 2000:GOTO 390
490 SYS 51332:SYS 50818:POKE 808,239:PRINT CHR$(147);
500 POKE 198,0:PRINT "PLEASE ENTER ";CHR$(34);"SAVE";
510 PRINT CHR$(34);" OR ";CHR$(34);"LOAD";CHR$(34)
520 PRINT "AND FILENAME, OR JUST PRESS"
530 PRINT "<RETURN> TO CONTINUE DRAWING.":PRINT
540 F$="":SYS 52079:CP=50274
550 IF PEEK(CP)<>13 AND CP<50529 THEN F$=F$+CHR$(PEEK(CP)):CP=CP+1:GOTO 550
560 IF F$=CHR$(32) THEN 710
570 IF LEN(F$)<6 THEN 600
580 C$=LEFT$(F$,5)
590 IF C$="SAVE " OR C$="LOAD " THEN 620
600 PRINT CHR$(147);
610 PRINT "PLEASE RE-ENTER.":PRINT:GOTO 500
    
```

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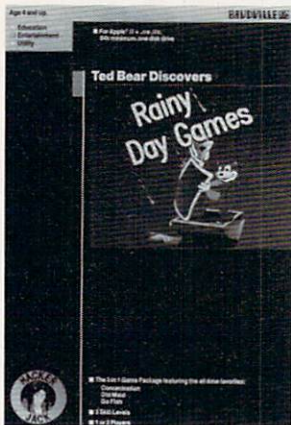
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CIRCLE READER SERVICE 5


```

620 CD--(CMS="SAVE"):FS=RIGHT$(F$,LEN(F$)-5)
630 IF CD=1 THEN FS=FS+"P,W":GOTO 650
640 FS=FS+"P,R"
650 OPEN 1,8,CD,FS:SYS 51228,CD:CLOSE 1
660 OPEN 15,8,15:INPUT#15,ENS,ETS,TRS,BK$:CLOSE 15
670 IF ETS="OK" THEN 710
680 OPEN 15,8,15,"I":CLOSE 15
690 PRINT CHR$(147);"A ";CHR$(34);ETS;CHR$(34)
700 PRINT "ERROR HAS OCCURRED.":PRINT:GOTO 500
710 SYS 51341:SYS 50859:SYS 50791
720 POKE 808,237:GOTO 390
1000 H=INT(V/256):L=V-H*256:RETURN
2000 MP=1:POKE 198,0:POKE SN+4,0:POKE SN+11,0
2010 POKE SN+1,M(MP,1):POKE SN,M(MP,2)
2020 POKE SN+8,M(MP,3):POKE SN+7,M(MP,4):D=0
2030 POKE SN+4,17:POKE SN+11,17
2040 SYS 51348
2050 IF PEEK(50789)=0 THEN FOR DL=1 TO 50:NEXT DL:RETU
RN
2060 IF TW THEN SYS 50927
2070 IF D<M(MP,5)*(10+8*TW) THEN D=D+1:GOTO 2040
2080 POKE SN+4,16:POKE SN+11,16
2090 MP=MP+1+46*(MP=46):GOTO 2010
3000 IF QS="" THEN GOSUB 4000
3010 V=ASC(LEFT$(QS,1)):QS=RIGHT$(QS,LEN(QS)-1)
3020 RETURN
4000 READ AS,BS,CS,DS,CS:CK$=AS+BS+CS+DS
4010 PRINT "NOW PROCESSING DATA IN LINE";LN
4020 QS=0:FOR PZ=1 TO LEN(CK$)-1 STEP 2
4030 HNS=MID$(CK$,PZ,1):LNS=MID$(CK$,PZ+1,1)
4040 DV=HD(ASC(HNS)-48)*16+HD(ASC(LNS)-48)
4050 QS=QS+CHR$(DV):QS=QS+DV:NEXT PZ
4060 IF QS<>CS THEN PRINT "THERE IS AN ERROR IN LINE";
LN:STOP
4070 SM=SM+CS:LN=LN+10:RETURN
5000 DATA 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F
6000 DATA 323C323C,02430F2A,3E01430F,2A3E0143,663
6010 DATA 0F2A3E02,4B45323C,02547D43,0F01547D,878
6020 DATA 3BA00154,7D386302,547D470C,024B454B,1099

```

```

6030 DATA 4501547D,470C0159,834B4502,3F4B323C,977
6040 DATA 024B453F,4B02430F,430F0264,79547D02,884
6050 DATA 6479547D,01547D4B,450170C7,470C0264,1281
6060 DATA 79547D02,6479547D,0159834B,45015983,1348
6070 DATA 4B450259,83430F02,59834B45,014B4543,1026
6080 DATA 0F016479,3F4B0259,834B4502,59834B45,1107
6090 DATA 01547D43,0F01547D,430F0203,01100019,631
6100 DATA 020B5501,FF04550E,0310001C,02020008,516
6110 DATA 0001102A,0101142A,050105AA,9401016A,560
6120 DATA 50010059,40010095,80010295,A0010259,916
6130 DATA 6001016A,500105AA,940116AA,A5011004,987
6140 DATA 01020004,00090310,02020020,00040003,78
6150 DATA 00050001,00000003,003C0001,003C2802,172
6160 DATA 003C2401,003C2802,06AA0001,02AA8009,845
6170 DATA 03100224,02015555,55034000,01014014,468
6180 DATA 01044055,01014014,01014000,01034014,394
6190 DATA 01014000,01015555,55050111,04000202,354
6200 DATA 04030501,0401000A,3C06020F,00020201,116
6210 DATA 01400305,50010140,02555504,05500404,488
6220 DATA 1004020B,04040202,03C0060F,F0023FFC,818
6230 DATA 01008001,010E0007,020E4007,020B0008,260
6240 DATA 02020100,02054001,55540115,50031550,452
6250 DATA 01145001,10100502,0B000A02,0103C001,361
6260 DATA 0FF0073F,FC010FF0,0103C002,020B0002,1065
6270 DATA 02010140,010FF001,1554013F,FC011554,852
6280 DATA 013FFC01,1554013F,FC011554,013FFC01,1161
6290 DATA 01400C02,0C000E02,01028001,08200120,312
6300 DATA 08010280,01082001,20080102,80010820,393
6310 DATA 01200801,02800108,20012008,0C030E00,283
6320 DATA 10020100,002A0100,00020100,02A20100,230
6330 DATA 00220100,2A220100,02200102,A2200100,344
6340 DATA 2220012A,22000102,22000202,20000202,220
6350 DATA 00000C03,0E001402,01A80000,01800000,349
6360 DATA 018A8000,01880000,0188A800,01088000,846
6370 DATA 01088A80,01088800,010088A8,01008880,990
6380 DATA 02000880,02000080,07020800,143201FF,611
6390 DATA 0002EA00,01EC0001,EB0001E2,C001E0B0,1529
6400 DATA 010020A9,028D00DD,A9788D18,D0AD11D0,1626
6410 DATA 09208D11,D0AD16D0,09108D16,D060A91B,1498

```

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CIRCLE READER SERVICE 15



HOLIDAY PROGRAM

```

6420 DATA 8D11D0A9,C88D16D0,A9148D18,D0A9978D,2129
6430 DATA 00DDA906,8D21D0A9,0085FBA9,D885FCA2,2263
6440 DATA 04A9CE20,E2C660A9,008D21D0,8D20D0A9,2032
6450 DATA 0085FBA9,8585FCA2,04A92520,E2C6A900,2027
6460 DATA 85FBA960,5FCFA204,A90620E2,C660A900,2216
6470 DATA 85FBA960,85FCA220,A90020E2,C660A000,2109
6480 DATA 91FB88D0,FBEBFCCA,D0F660A2,01A97885,2810
6490 DATA FBA95C85,FCA000BD,16C791FB,E6FBD002,2554
6500 DATA E6FCA5FB,C9F00D0EF,A5FCC960,D0E9CA10,2919
6510 DATA DC602515,A217BDA5,C78DA2C7,CABDA5C7,2369
6520 DATA 8DA3C7CA,BDAS5C785,FCCABDA5,C785FB8A,2920
6530 DATA 48206EC7,68AACA10,DDA205BD,BDC785FC,2255
6540 DATA CABDBDC7,85FB8A48,2055C768,AA10EB,2416
6550 DATA 60A000A2,28A9FF91,FB18A908,65FB85FB,2215
6560 DATA A90065FC,85FCCAD0,EC60ADA3,C729078D,2373
6570 DATA A4C7ADA3,C729F818,6A6A6AAA,A007ADA2,2201
6580 DATA C791F8A9,10FB18A9,4065FB85,FBA90165,2262
6590 DATA FC85FCCA,3007D0E4,ACA4C7D0,E1600000,2394
6600 DATA 000060BF,C0BB6015,03D86015,03F86015,1484
6610 DATA 03186115,033861BF,03006086,6200FEA9,1118
6620 DATA B185FBA9,C285FCA9,0085FDA9,C185FEA0,2773
6630 DATA 00A207B1,FB3D14C8,D00EAD64,C61D14C8,1820
6640 DATA 8D64C6CA,CA4CF7C7,CAAD64C6,3D14C88D,2460
6650 DATA 64C6CA10,DE91FDE6,FB0002E6,FCE6FDD0,3000
6660 DATA 02E6FEA5,FC9B1D0,C8A5FEC9,C2D0C260,3002
6670 DATA FC03F30C,CF303FC0,20FDAE20,9EAD20F7,2121
6680 DATA B7A514F0,12A9C085,FBA96385,FCA080A2,2474
6690 DATA 00A9FB20,D8FF60A9,6085B9A2,C0A063A9,2384
6700 DATA 0020D5FF,6020FDAE,209EAD20,F7B7A514,2065
6710 DATA 8D0CC00A,0A0A0A8A,A200B900,C09D00C0,1441
6720 DATA C8E8E00C,D0F460A9,6285FBA9,C585FCA9,2787
6730 DATA 00A20120,E2C660A9,018D64C6,2079C960,1774
6740 DATA A9008D64,C62079C9,602051C9,2029C960,1742
6750 DATA A97F8D00,DCA9FF89,00DCA801,DC48290F,1977
6760 DATA 8D66C668,A0002910,F001C88C,65C6A981,1940
6770 DATA 8D0DDC60,2094C8AD,66C6C90F,D034AD00,1985
6780 DATA C0D0F1AD,65C6D0EC,AD0BC0C9,18B006A9,2509
6790 DATA 018D0DC0,60AD0CC0,C901D00C,2051C920,1588
6800 DATA 7BC82029,C94CB8C8,C90FF0C8,207BC84C,2144
6810 DATA B8C8A900,8D0D0C02,84C820EB,C9AD0BC0,2107
6820 DATA C9189018,AD0CC0C9,01D011AD,65C6D00C,1889
6830 DATA 2051C920,7BC82029,C94CB8C8,207BC820,1790
6840 DATA 8DC84CB8,C8AD02C0,85FBAD03,C085FCA9,2474
6850 DATA 008D64C6,201DCBAD,09C0F008,A9008D64,1735
6860 DATA C62046CB,A9038D64,C62079C9,60AD04C0,1933
6870 DATA 85FBAD05,C085FCA9,FF8D64C6,201DCBAD,2439
6880 DATA 09C0F008,A9018D64,C62046CB,A9028D64,1775
6890 DATA C62079C9,60AD0C00,85FBAD01,C085FCA2,2310
6900 DATA 00AD07C0,8D63C6A0,00AD64C6,D008BD62,1944
6910 DATA C591FB4C,BBC9C901,D008B1FB,9D62C54C,2431
6920 DATA BBC9C902,D00ABD62,C431FB91,FB4CBBC9,2452
6930 DATA BD62C411,FB91FBE8,18986908,A8186A6A,2072
6940 DATA 6ACD06C0,30C3F0C1,E6FBD002,E6FCA5FB,2774
6950 DATA 2907D00D,18A5FB69,3885FBA5,FC690185,1910
6960 DATA FCCE63C6,D0A1606E,66C6B03E,6E66C620,2310
6970 DATA D0CAAD0B,C0C901F0,64CE0BC0,38AD00C0,2158
6980 DATA E9018D00,C0AD01C0,E9008D01,C0AD00C0,1865
6990 DATA 2907C907,D04738AD,00C0E938,8D00C0AD,1751
7000 DATA 01C0E901,8D01C04C,61CA6E66,C6B02E38,1824
7010 DATA A9BEED07,C0CD0BC0,F023EE0B,C0EE00C0,2349
7020 DATA D003EE01,C0AD00C0,2907D011,18AD00C0,1669
7030 DATA 69388D00,C0AD01C0,69018D01,C06E66C6,1710
7040 DATA B02EAD0A,00C909F0,62CE09C0,CE09C0AD,2123
7050 DATA 09C0C9FE,D055A906,8D09C0CE,0AC038AD,2103
7060 DATA 00C0E908,8D00C0AD,01C0E900,8D01C060,1795
7070 DATA 6E66C6B0,3620D8CA,38A927ED,06C0CD0A,2004
7080 DATA C0F02890,26EE09C0,EE09C0AD,09C0908A,2115
7090 DATA D019A900,8D09C0EE,0AC018AD,00C06908,1686
7100 DATA 8D00C0AD,01C06900,8D01C060,AD0BC0C9,1811
7110 DATA 17F01060,AD0BC0C9,17900160,AD0AC0C9,1792
7120 DATA 1B9007AD,0CC0C90F,D00160AD,00C048AD,1686
7130 DATA 01C048AD,0AC048AD,0BC048AD,09C048A9,1775
7140 DATA 0F2054C8,688D09C0,688D0BC0,688D0AC0,1672
7150 DATA 688D01C0,688D00C0,60A200AD,07C08D62,1744
7160 DATA C6A000AD,06C08D63,C6B1FB9D,62C4E8C8,2478
7170 DATA CE63C6D0,F4AD64C6,9D62C4E8,CE62C6D0,2819
7180 DATA E26018AD,08C06D07,C08D62C6,AC09C0AD,2010
7190 DATA 62C68D63,C6A20038,AD64C6D0,01187E62,1880

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7200 DATA C4E8CE63,C6D0F788,D0E560A2,008E62C6,2655
7210 DATA 2057F1AE,62C69D62,C4C90DF0,05EE62C6,2274
7220 DATA D0EE6000,00000000,00000000,00000000,542

```

IBM PC & compatibles* w/joystick & disk drive/ Christmas Tree Construction Set

*This program has been tested on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color Graphics adapter, w/Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 00.05.00.

```

10 DEFINT A-Z
20 DIM P(16),CI(50),CM(50),IT(15,52),MT(15,50)
30 DIM SAV(50),SCN(8000)
40 DIM M(46,3),FR(4,4)
50 SCREEN 0,1:CLS:WIDTH 40:KEY OFF:STRIG ON:PLAY "MF"
60 FOR I=1 TO 15:READ M(I,1),M(I,2)
70 M(I+15,1)=M(I,1):M(I+15,2)=M(I,2):NEXT I
80 FOR I=31 TO 46:READ M(I,1),M(I,2):NEXT I
90 FOR I=0 TO 3:READ P(I):NEXT I
100 FOR I=1 TO 4:FOR J=1 TO 4:READ FR(I,J)
110 NEXT J:NEXT I:FOR N=1 TO 15
120 READ IT(N,0),IT(N,1),IT(N,2)
130 FOR J=0 TO IT(N,2):READ IT(N,J+3):NEXT J
140 IF N<12 OR N=15 THEN FOR J=0 TO IT(N,2):READ MT(N,J):NEXT J
150 NEXT N
160 LOCATE 10,10,0:COLOR 4:PRINT "*FAMILY COMPUTING*"
170 LOCATE 12,12:COLOR 2:PRINT "CHRISTMAS TREE"
180 PRINT TAB(11);"CONSTRUCTION SET":LOCATE 23,5
190 COLOR 14:PRINT "PRESS JOYSTICK BUTTON TO BEGIN."
200 FL=0:GOSUB 1000
210 GOSUB 2000
220 N=15:GOSUB 3000:X=150:Y=100
230 GET (X,Y)-(X+W,Y+D),SAV
240 PUT (X,Y),CM,AND:PUT (X,Y),CI,OR
250 JX=STICK(0):JY=STICK(1)
260 VH=4*(JX<30 AND X>4)-4*(JX>70 AND X+W<310)
270 VV=4*(JY<30 AND Y>4)-4*(JY>70 AND Y+D<194)
280 IF VH OR VV THEN 350
290 IF NOT STRIG(1) THEN 250
300 IF Y<=21 THEN 410
310 IF N=15 THEN 250
320 IF N=11 THEN PUT (X,Y),CM,AND
330 GET (X,Y)-(X+W,Y+D),SAV:IF N<>11 THEN 250
340 PUT (X,Y),CI,OR:GOTO 250
350 PUT (X,Y),SAV,PSET
360 X=X+VH:Y=Y+VV
370 IF Y<=21 AND VV<0 AND N<>15 THEN N=15:GOSUB 3000
380 IF N=11 AND STRIG(1) AND Y>20 THEN 320
390 GET (X,Y)-(X+W,Y+D),SAV:PUT (X,Y),CM,AND
400 PUT (X,Y),CI,OR:GOTO 250
410 IF X>200 THEN FC=INT((X-200)/30)+11 ELSE FC=INT((X-8*(X<160))/20)+1
420 IF FC<12 THEN N=FC:PUT (X,Y),SAV,PSET:SOUND 600,2:GOSUB 3000:GOTO 390
430 IF FC=12 THEN 210
440 IF FC=13 THEN FL=1:GOSUB 1000:GOTO 250
450 PUT (X,Y),SAV,PSET:GET (1,21)-(318,198),SCN
460 N=15:SCREEN 0:ON ERROR GOTO 630
470 CLS
480 PRINT "Please enter SAVE or LOAD"
490 PRINT "and filename, or just press"
500 PRINT "<RETURN> to continue drawing."
510 PRINT:INPUT FS:IF FS="" THEN 620
520 CS=LEFT$(FS,4):NS=RIGHT$(FS,LEN(FS)-5)
530 IF CS<>"LOAD" THEN 580
540 PRINT:PRINT "Loading ... please wait."
550 OPEN NS FOR INPUT AS 1
560 FOR I=0 TO 8000:INPUT#1,SCN(I):NEXT I
570 CLOSE 1:GOTO 620
580 IF CS<>"SAVE" THEN CLS:PRINT "Please re-enter.":PRINT:GOTO 480
590 PRINT:PRINT "Saving ... please wait."
600 OPEN NS FOR OUTPUT AS 1
610 FOR I=0 TO 8000:PRINT#1,SCN(I):NEXT I:CLOSE 1
620 GOSUB 2000:PUT (1,21),SCN:GOTO 220
630 CLOSE 1:CLS:PRINT
640 PRINT "Error";ERR;"has occurred."
650 PRINT:RESUME 480

```

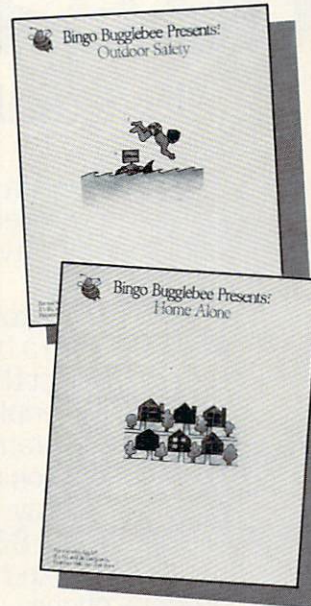


```

1000 MP=1
1010 SOUND M(MP,1),M(MP,2)*5:SOUND 100,1
1020 MP=MP+1+46*(MP=46)
1030 IF FL AND RND>.5 THEN PALETTE 1,7:PALETTE 1,4
1040 IF NOT STRIG(1) THEN 1010:STRIG OFF
1050 FOR I=1 TO 500:NEXT I:STRIG ON:RETURN
2000 CLS:SCREEN 1,0:PALETTE USING P(0):FOR I=1 TO 4
2010 LINE (FR(I,1),FR(I,2))-(FR(I,3),FR(I,4)),3,B
2020 NEXT I:FOR N=1 TO 14:GOSUB 3000:X=IT(N,0):Y=IT(N,
1)
2030 PUT (X,Y),CI,PSET:NEXT N:RETURN
3000 FOR J=0 TO IT(N,2)
3010 CI(J)=IT(N,J+3):CM(J)=MT(N,J):NEXT J
3020 W=IT(N,3)/2-1:D=IT(N,4)-1
3030 SAV(0)=IT(N,3):SAV(1)=IT(N,4):RETURN
4000 DATA 392,2,523,1,523,1,523,2,587,2,659,1,659,1
4010 DATA 659,2,659,2,587,1,659,1,698,2,494,2,587,2
4020 DATA 523,2,784,2,784,1,659,1,880,2,784,2,784,1
4030 DATA 698,1,698,2,698,2,698,1,587,1,784,2,698,2
4040 DATA 698,1,659,1,659,2,-1,4,2,1,0,0,319,2,0,20
4050 DATA 319,199,200,0,230,2,0,260,0,290,2,0,5,4,8,8
4060 DATA 14,1028,1285,1029,15360,15420,15420,15420
4070 DATA 8,14,-3085,-3056,-3088,-15361,-15421,-15421
4080 DATA -15421,20,3,16,16,15,16385,20485,20485
4090 DATA 20485,16385,21845,21845,20485,20485,20485
4100 DATA 20485,4100,4100,4100,4100,16,15,16380,4080
4110 DATA 4080,4080,16380,0,0,4080,4080,4080,4080
4040 DATA 698,1,659,1,659,2,-1,4,2,1,0,0,319,2,0,20
4050 DATA 319,199,200,0,230,2,0,260,0,290,2,0,5,4,8,8
4060 DATA 14,1028,1285,1029,15360,15420,15420,15420
4070 DATA 8,14,-3085,-3056,-3088,-15361,-15421,-15421
4080 DATA -15421,20,3,16,16,15,16385,20485,20485
4090 DATA 20485,16385,21845,21845,20485,20485,20485
4100 DATA 20485,4100,4100,4100,4100,16,15,16380,4080
4110 DATA 4080,4080,16380,0,0,4080,4080,4080,4080
4120 DATA -12301,-12301,-12301,-12301,4,0,5,12,16,11
4130 DATA -16381,-16381,-4081,-4081,-4081,-4081,-4081
4140 DATA -4081,-961,-961,16384,16,11,16380,16380,4080
4150 DATA 4080,4080,4080,4080,4080,960,960,16383,60,4
4160 DATA 7,8,12,16448,16448,16448,16448,16448,16448
4170 DATA 8,12,16191,16191,16191,16191,16191,16191
4180 DATA 80,4,12,16,11,1,1,16389,16389,21589,20501
4190 DATA 16389,16389,16389,20500,4112,16,11,-4,-4
4200 DATA 16368,16368,768,4032,16368,16368,16368
4210 DATA 4035,-12337,100,4,12,16,11,16385,20485
4220 DATA 21525,21525,21525,21525,21525,21525,21525
4230 DATA 20485,16385,16,11,16380,4080,960,960,960
4240 DATA 960,960,960,960,4080,16380,120,4,12,16,11
4250 DATA 16385,-4081,21525,-961,21525,-961,21525
4260 DATA -961,21525,-4081,16385,16,11,16380,4080,960
4270 DATA 960,960,960,960,960,960,4080,16380,140,4,13
4280 DATA 16,12,-32766,8200,2080,-32766,8200,2080
4290 DATA -32766,8200,2080,-32766,8200,2080,16,12
4300 DATA 16380,-12301,-3121,16380,-12301,-3121,16380
4310 DATA -12301,-3121,16380,-12301,-3121,160,4,22,24
4320 DATA 14,0,42,512,512,162,8704,10752,34,8194
4330 DATA -24062,32,8226,8746,512,34,8194,512,32,2,512
4340 DATA 0,24,14,-1,-64,-769,-769,-244,-13057,-16129
4350 DATA -52,-12292,3324,-49,-12340,-13120,-769,-52
4360 DATA -12292,-769,-49,-4,-769,-1,180,4,22,24,14
4370 DATA 168,-32768,0,-32630,-30720,0,-22392,2048
4380 DATA 128,-30200,2176,136,-30720,168,-32632,2048
4390 DATA 128,-32760,0,128,-32768,24,14,-253,16383,-1
4400 DATA 16176,13311,-1,819,-3073,-193,12531,-3265
4410 DATA -205,13311,-253,16179,-3073,-193,16371,-1
4420 DATA -193,16383,215,3,9,8,16,21845,21845,21845
4430 DATA 21845,-171,-171,-171,21845,8,16,0,0,0,0,0
4440 DATA 0,0,240,2,25,24,16,2048,0,8,10768,5121,1322
4450 DATA -22011,404,20586,22784,64,-32619,-27390,672
4460 DATA 24665,27137,1360,-27478,-21994,4261,260,1024
4470 DATA 0,4,270,1,28,24,18,1024,0,4,1280,0,5,1280,0
4480 DATA 4,0,0,60,15360,0,60,15360,0,10300,15360,34
4490 DATA 8764,15360,2600,-24406,-22006,672,-32598
4500 DATA 300,3,25,24,16,21845,16469,256,64,16385,276
4510 DATA 21824,16385,341,21824,16385,276,64,16385,276
4520 DATA 5184,16385,276,5184,16385,276,64,21761,21845
4530 DATA 150,100,7,16,6,170,160,136,130,-32768,8192
4540 DATA 16,6,-256,-241,-205,-196,16383,-12289

```

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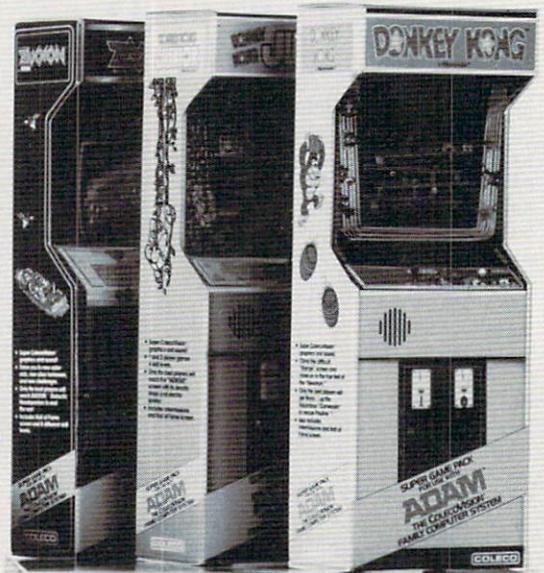
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Edited by Anne Krueger

FOR THE COMPUTER GENERATION

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Rudolph Goes Reggae!

The Queen of King's Quest II

Five years ago, on a brand-new Apple II computer, Roberta Williams played *Original Adventure: Colossal Caves*, a text/adventure game. She was fascinated with how it let her place herself in the story. One thing was lacking, however: graphics. Roberta wanted to see the adventure on-screen as well as in her imagination, so she took things into her own hands. Along with her husband, Ken Williams, she created a company called Sierra On-Line, and *Mystery House*, the first-ever graphic adventure. Her next step was to develop a color graphic adventure—*Wizards and Princes*.

Still not satisfied, Roberta and a design team at Sierra invented *King's Quest*, their first animated adventure. In *King's Quest*, the player uses a joystick to move the hero through a world of three-dimensional graphics in search of lost treasure. This arcade/adventure hybrid was a critical and financial success.

How did she top that one? With *King's Quest II: Romancing the Throne*. The sequel picks up a few years later where *King's Quest* left off, when King Graham sets off in search of a bride. "It's an evolution from *King's Quest*," Roberta declares. "It's bigger, it has multipart music, better sound effects, more animation, and a story that is put together better."

King's Quest II is a team effort, the product of input from several experts. "You could call me the writer and director," Roberta says. "First, I had to map out the game world and draw sketches of each area so that the artist would know what they should look like. I planned all the

messages given to the user, along with all the correct responses, synonyms, and anything I thought the player might type in. I then consulted with the music composer to decide what music to include and where it should be placed. As the game was being programmed, I



Roberta Williams, designer of *King's Quest II*

made sure that things were turning out the way I had envisioned them."

When designing *King's Quest II*, Roberta decided to use well-known imaginary creatures, including Pegasus (a winged horse of Greek mythology), Count Dracula (a legend), and Little Red Riding Hood (a fairytale character). Because users have preconceived ideas about these characters, they can add their own imagination to the roles.

For those playing *King's Quest II*, Roberta's advice is to "save your game as often as possible, and not only should you map, but make detailed notes of everything." She adds, "Also, to obtain the magic keys

[necessary for victory], you must do some things in a chronological order. For example, the mermaid will not allow herself to be found until you read the inscription on a certain door."

Writing adventure games sounds like a great job, doesn't it? But if you want to be a game designer, be warned—it's not as easy as it may seem. "I love my job," says Roberta, "and I know that there are many talented, creative people out there like me who would enjoy game designing. But the market is very competitive, and usually only the best of games will sell.

"If you're planning on starting a company," she adds, "make sure you have a very good design team, or otherwise have good skills in every facet of game creation. If you want to write adventures, but are not quite ready to start your own company, you can submit your game plans to Sierra, or another already existing company. However, the plans will have to be very complete for the game to be even considered."

What will be the next "Roberta Williams creation"? Will there be a *King's Quest III*? Right now, Roberta has a modern mystery/horror story in the works. "I want it to be scary," she said. "It will have graphics and animation, but it won't have the same whimsical, colorful atmosphere as do *King's Quest* and its sequel." The game, as yet untitled, will probably be available next fall. As for a possible *King's Quest III*, Roberta says, "Eventually, but not in the near future. I want to try some different, more serious adventure games first."

—ALEX SHAKAR

The Special Ks' Buyer's Guide to Controllers

K-POWER's Special Ks (David Langendoen, Damon Osgood, and Alex Shakar) have logged hours of intense game play on all sorts of joysticks. Their finding: It's not always the price tag that makes for a hot-shot controller. What they suggest is to look for sturdy construction, well-placed fire button(s), and a stick that has just the right amount of give. Their thoughts on some of the most popular controllers follow. Compatibility and prices are specified within parentheses.

APPLE

APPLE JOYSTICK (Apple IIe/IIc; \$59.95). Comfort and durability are this joystick's strong points. The stick is fairly loose (maybe too loose for some games), and the fire buttons make rapid fire easy. Both buttons are located on top of the base, so it's sometimes difficult to use both at once.

ATARI

CX43 SPACE AGE (Atari, C 64; \$9.95). Built for comfort above all, this joystick is pistol-shaped, with a trigger-type fire button and the stick on top. The trigger is very sensitive, but the stick isn't always accurate.

CH PRODUCTS

MACH III/III (Apple II plus/IIe/IIc, IBM PC/PCjr, Tandy CoCo; \$44.95-\$54.95). An exceptionally comfortable and accurate joystick, the Mach II has a sturdy base and a metal stick for extra durability. The stick itself is a little too loose for some games, and the fire buttons are fast. A special feature lets you perfectly center the joystick by turning a couple of knobs. The Mach III has an added button on top of the stick. This is a good feature, but makes the stick somewhat top-heavy and can slow down play.

COIN CONTROLS

COMPETITION PRO 5000 (Apple IIe/IIc, Atari, C 64, TI-99/4A with \$7.95 adapter; \$17.95-\$29.95). One of the best joysticks we tested, the model 5000 is accurate, durable, and good for extended play. There are two large fire buttons on the base that are helpful for rapid fire.



Apple games requiring two buttons are difficult to play because the buttons are spaced far apart.

KRAFT

KRAFT PREMIUM (Apple II series, IBM PC; \$32.95) and **KRAFT QUICKSTICK** (Apple IIc/Macintosh; \$69.95-\$79.95). A superior joystick in every respect, the Premium is extremely accurate and comfortable to use. The fire buttons are responsive, and placed so you can use both without moving your hand. An added feature: The user can switch between a self-centering and a free-floating stick. Quickstick has a mouse option.

SWITCH-HITTER (Atari, C 64; \$11.95). Although this joystick feels and looks fragile, the fire button works well, and the stick is responsive and easy to control. There is also a switch that lets you alternate between four- and eight-way directional control.

RADIO SHACK

THE DELUXE JOYSTICK (Tandy CoCo; \$19.95 a pair). This joystick is hard to use in some game situations because it is free-floating and not par-

ticularly accurate. The fire button is good (when it doesn't pop off), and the stick is fairly comfortable.

SUNCOM

TAC 2 (Atari, C 64, VIC-20; \$12.95). The casing is hard plastic, and the stick is metal with a plastic ball on top. It fits snugly in your hand, feels solid, and provides accurate control. The only drawback is the stiff fire button, which cuts down on speed.

STARFIGHTER (Apple II series [S5.95 adapter needed with II/II plus], Atari, C 64; \$10.95-\$24.95). The Apple version offers two unique features: a throw selector, which lets you adjust how far you want to move the joystick, and a high/low sensitivity switch. The fire buttons are slightly stiff, and the alternate button on the Apple may give righties some difficulty since they have to reach past the cord to press it.

T.G. PRODUCTS

J-2000 JOYSTICK (Apple II series, IBM PC/PCjr; \$49.95). Good for long periods of game play, this joystick consists of a big, sturdy base, a small stick on the right, and two large buttons on the left. The user can choose between self-centering and free-floating stick modes. The two fire buttons are good for fast firing, but might break after too much use.

WICO

THE BOSS (Atari, C 64; \$17.95). The Boss is one of the best sticks on the market. It features a square base with rounded edges, a "grip" handle that offers comfort with little slipping, and a fire button on top that is built for speed and comfort. There is no button on the base. This can be a drawback if you don't like top-of-stick firing. It can become very tiring on the hand if used for prolonged periods.

COMMAND CONTROL (Atari, C 64, TI-99/4A, VIC-20; \$26.95, \$32.95 for combination model). The Command Control's base is slightly larger and has a fire button in the left-hand corner, as well as on the stick. To the rear of the stick is a switch that lets you select operating buttons. The Command Control comes with a "bat" handle, or with three interchangeable handles: bat, ball, and grip.

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DOCTOR KURSOR'S KLINIC

Is there a way to get into and change programs in cartridges?

DR. KURSOR: If you pried open a cartridge (which I *don't* recommend!), you'd find out why it's so light and rugged: All that's inside is a ROM chip or chips, plus connectors. (See illustration.)

ROM is Read-Only Memory. That means the contents can't be changed. BASIC and your computer's operating system are usually put in ROM so you don't have to load them each time you turn on the computer.

That's also true with a cartridge game: As soon as you plug it in, the program is there. You can't erase it by accident—or on purpose. The only way to change it is to replace the chip.

But if you just want to add a new routine or "tweak" the cartridge program a little (say, make it run faster or slower), you can look inside the cartridge using BASIC PEEKS or a monitor program. (Some computers, though, are automatically reset when you insert a cartridge, and it takes control.)

Commercial programs available for some computers transfer the contents of a cartridge onto a disk or cassette.

So if you have a pretty good knowledge of your computer's machine language, you can alter the program and save your revised version. Another alternative is to write your own programs that CALL routines in the cartridge.

Remember that cartridge programs are copyrighted just like disks and cassettes. Giving away or selling copies of any copyrighted program is *stealing*. It's both wrong and illegal! Acts like that give hackers a bad name.

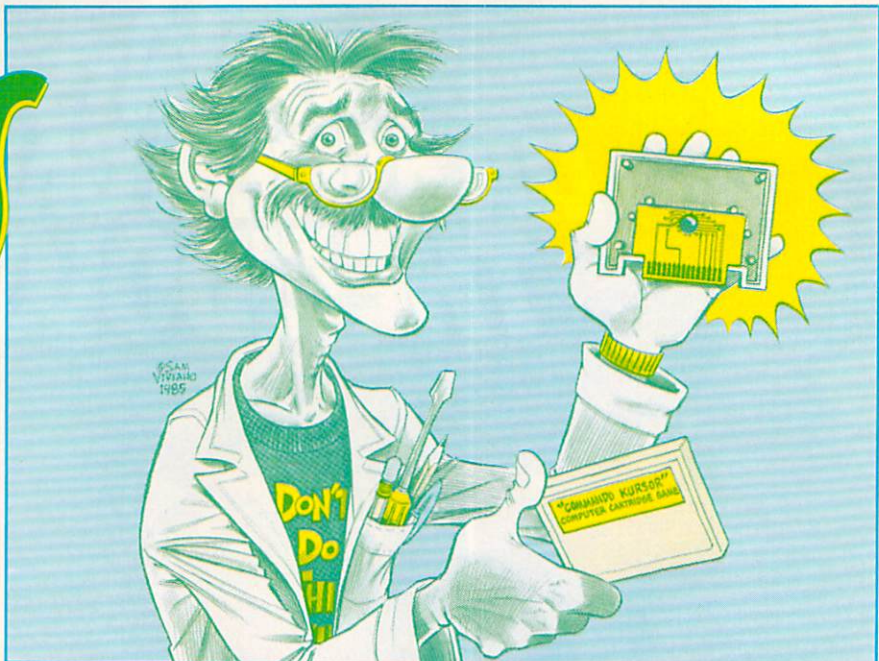


ILLUSTRATION BY SAM VIVIANO

What's the difference between dot-matrix and letter-quality printers?

DR. KURSOR: By "dot-matrix," most people mean "dot-matrix impact printers" that use fabric ribbons. Their printheads carry vertical rows of nine to 24 pins. As the printhead moves across the paper, the pins "fire" against the ribbon, producing pinpricks of ink which form the image. (See diagram.)

Other printers also use a "matrix" (or pattern) of dots to create letters. Thermal printers burn dots onto specially treated paper. Ink-jet printers spray ink, while thermal-transfer printers melt a spot of waxy ribbon, causing a tiny bit of ink to flow onto the paper. Laser printers create a pattern of magnetically charged dots on a drum

that attracts ink.

These printers range from cheap (thermal) to very expensive (laser), and they're all technically "dot-matrix" printers.

A letter-quality printer doesn't use dots, but works more like a typewriter. Its print element—usually a daisywheel—presses the character image against a ribbon, creating a letter on paper. (See diagram.)

At one time, letter-quality printers were heavy-duty machines made—and priced—for the business market. Generally, a letter-quality printer is more expensive to manufacture than a dot-matrix. This is because additional parts are needed to precisely position the print element. But printer prices have finally dropped; many cost less than \$400!

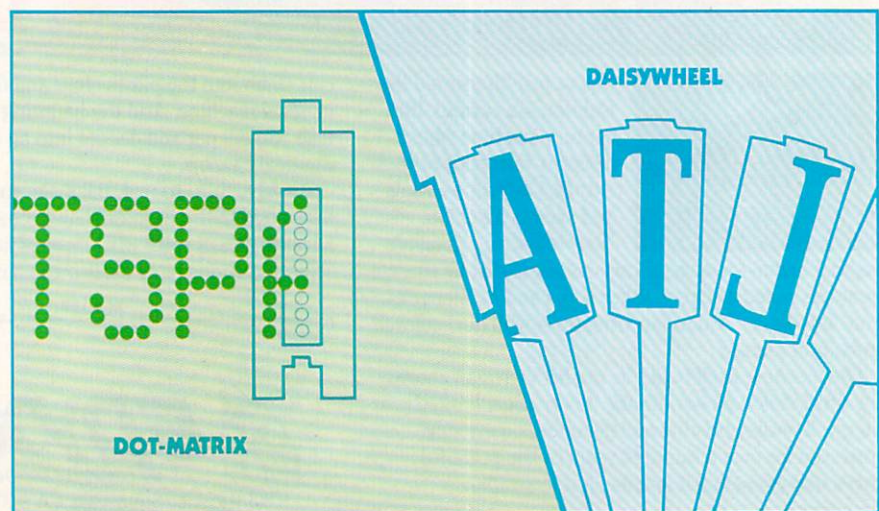
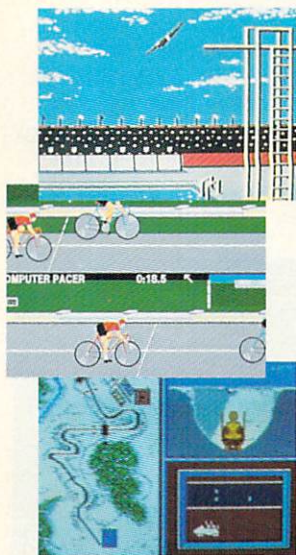


DIAGRAM BY JAMES MONTALEANO

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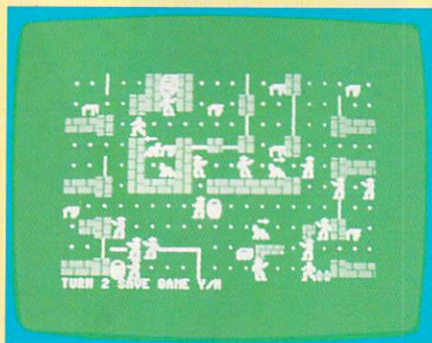
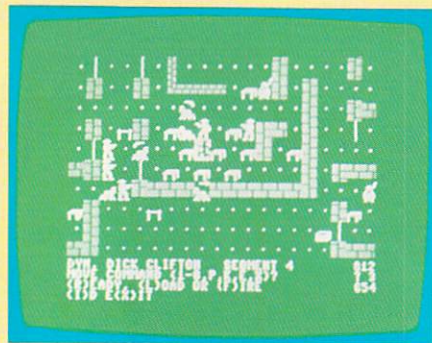
TIPS, TRICKS, AND HINTS

SIX-GUN SHOOTOUT

SSI. Strategy/simulation/role-playing. Your mission: Recreate some of the famous gunfights from the Wild West and movies. Take the part of the Earps, Daltons, Billy the Kid, or even Blondie (Clint Eastwood) from *The Good, The Bad, and The Ugly*. (Hints and game for Apple, Atari, C 64).

🔑 Examine your side and see what other weapons you are carrying. Always change to long arms if that skill is good or better than your side arm skill. Don't ignore knives and other hand-to-hand weapons; if a character is good with them, have him hide behind an obstacle in a prone position and wait for the enemy to go by. You shouldn't have much trouble killing an opponent this way, as hand-to-hand weapons always inflict serious wounds.

🔑 (Against the computer) In the scenario "The Battle of Ingalls" (if you play the bad guys), have Red Buck Weightman carry the dynamite. Then move him southwest one square and throw the dynamite on the square below. Get him to ready his knife and wait in a prone position in the place that he dynamited. He should be able to take out quite a few marshals who walk by his hid-



ing place. Move up all your other characters (except Bill Doolin and Raidler) towards the marshals and then kneel or lie flat behind the tables. Have Doolin stay at a range of seven (his maximum) and snipe at enemies. Raidler should use his repeater from his starting position.

🔑 (Against the computer) Have your weaker characters move in front of your better ones. The enemy

will fire upon your front line, allowing your good characters to kill off the enemy without much damage.

🔑 (Against the computer) In the scenario "Northfield Nightmare" (if you play the bad guys), have all your characters who can, change to repeaters. Concentrate on killing Allen and Heywood, as they have knives and start out fairly close to your characters. Then try to take out Ingalls. When this is done, have Jim and Cole Younger jump over the half-wall next to them. Make them lie prone and then kill Wheeler. Load up their repeaters and have them try to sneak up on the enemy.

🔑 (Against the computer) Possibly the toughest scenario (for the good guys) is "El Siete Magnifico." You'll need to get close enough to the enemy riflemen to kill some of them. Otherwise, they will butcher you from far away, while you will only be able to kill a few of the revolver-carrying bandits. The Chico Kid and perhaps S.M. Jones are the best suited, although there is a good chance they will die in the process. Have Lee Gold kneel and fire, and while he is being shot at, let the Chico Kid try to get close. Good luck, pard'ner. —DAVID LANGENDOEN, 17, Brooklyn, New York

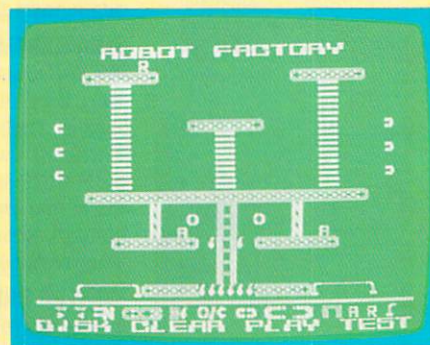
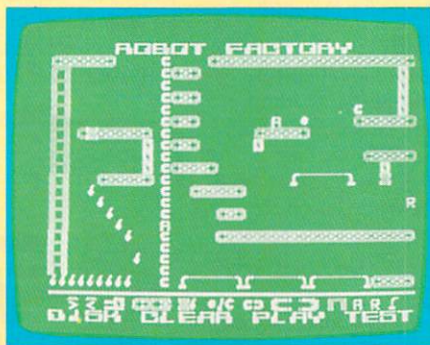
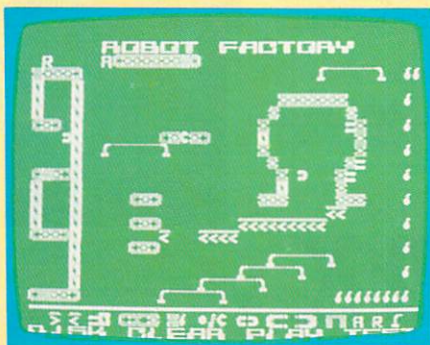
MR. ROBOT AND HIS ROBOT FACTORY

Datamost. Arcade/construction set. Your mission: to trundle around a multileveled factory, consuming power pellets and avoiding alien fire and other assorted obstacles. (Levels created on the Apple.)

🔑 Got the "Mr. Robot blues"? That's when you've played all of the

levels to be found in Mr. Robot, gotten more points than a human should be allowed to get, but still want more. You've tried to make your own levels, but playing them just wasn't a challenge. What to do, what to do . . . if only you could find someone to make some hot new levels for you. Well, look no further!

Here, for your use and abuse, are not one, not two, but three, three, THREE new levels to tease your brain and rattle your joystick. Just copy them exactly as you see them in the pictures (without missing any blocks), save them, and then play away! —DAMON OSGOOD, 17, Brooklyn, New York



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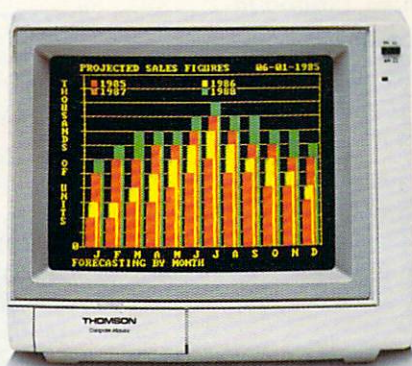
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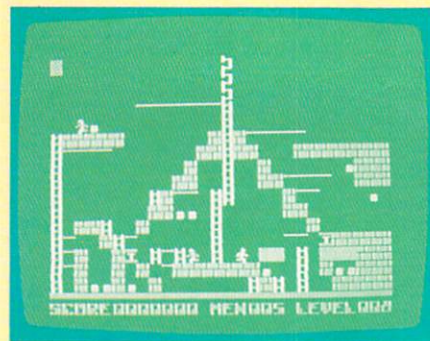
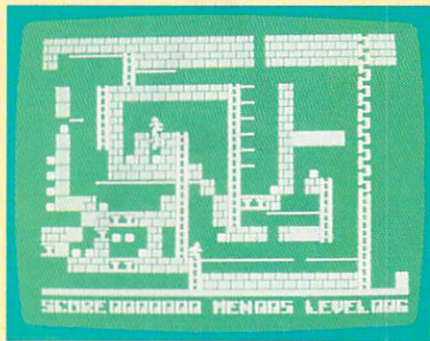
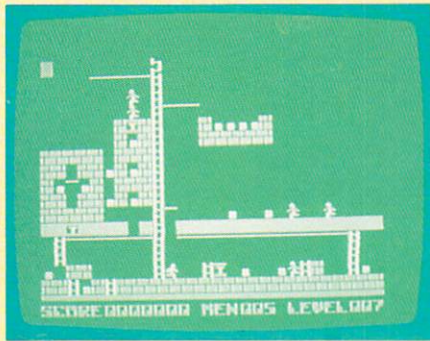
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CIRCLE READER SERVICE 53

LODE RUNNER



Broderbund. Arcade/strategy. Your mission: to climb your way through the 150 different screens and collect all the gold you can lay your hands on. (Levels created on Apple.)

🔑 Bored, bored, bored—You've solved every screen with the monitor turned off and one hand tied behind your back. Here are three original boards to alleviate those doldrums.

Just copy the above screens onto your disk and you're ready to go. — DAVID LANGENDOEN, 17, Brooklyn, New York

H I N T H O T L I N E

SWASHBUCKLER, Datamost (Apple). Arcade/strategy. Your mission: to fight off a horde of evil pirates, brigands, and their nasty pets (rats, spiders, et al) using your rapier and Errol Flynn-like fighting prowess.

🔑 When fighting a barbarian (bald head and club) past the first level, push him to the edge of the screen and keep lunging. He will eventually drop his guard, and you can skewer him.

🔑 Once you kill one of your opponents, force the second to the edge of the screen and strike him. Then, before he stands, lunge again, and he'll come up into your blade and die without a fight. —STEVEN KONECNY, Carson City, Nevada; CHRIS BOLEN, 14, Chico, California

MINER 2049er, Micro Fun (Apple only). Arcade/skill. Your mission: Claim all the mine sections while avoiding radioactive mutants.

🔑 When you're asked for the number of players, press SHIFT-3. You can now play any level you want by just pressing the corresponding number key.

🔑 To get extra men, wait for the message PLAYER 1 PREPARE TO ENTER LEVEL 1, then press CONTROL-RESET. You now should see a prompt and cursor at the bottom of the screen (if the computer reboots, try again). Type CALL-151, press RETURN, then type 816: (any number of men from one to 27) and press RETURN. Finally, type 980G and press

RETURN again. The game will load, but now you will have the specified number of men. This hint can be used with the first hint. —JOHN LUNA and JUSTIN MAYER, 14, Woodland Hills, California; JOHN A. BASE, 14, Burke, Virginia

FLIGHT SIMULATOR II, subLOGIC (Apple, Commodore 64). Simulation. Your mission: to learn how to take off in, fly, and land a small plane.

🔑 If you're low on fuel and there is no airport nearby (or you just aren't very good at landings), go into the editor mode, and then go back to flight mode. When you return, your fuel tanks will be full. —TROY HANSON, 11, Buffalo, Minnesota; J. F., 11, Salem, Virginia

AQUATRON, Sierra On-Line (Apple). Arcade/skill. Your mission: to destroy the invaders of your water-covered world.

🔑 Holding down the CONTROL and SHIFT keys and pressing 2 on the Apple IIe and IIc, or P on the II plus, will advance you one level. If you do this to jump past a Suicide Level, you'll get a free base. —ROBERT VOLDEMAR ZEMMEIS, 14, Tacoma, Washington

CONAN, Datasoft (Apple). Arcade/adventure. Your mission: to seek out and destroy the evil Volta, Conan's archenemy.

🔑 On the fourth level, after you unlock the door, go back to where you got the key. You'll then receive

another key, which you can use to relock the door (although you can still walk through it). Repeat this and you can continue unlocking and locking it, meanwhile building a large score. —CURT HEPNER, 16, Vallejo, California

SUMMER GAMES, Epyx (Apple, Atari, Commodore 64). Sports simulation/arcade/strategy. Your mission: to outperform computer or human opponents in eight events modeled after the Olympic contests.

🔑 In the Pole Vaulting event, try this when you get to heights of 5.5 meters and over: choose low pole grip, and as soon as you plant your pole, push up. Then press the button just before your pole knocks the bar down. If done correctly, you'll fly under the bar but get a successful jump nonetheless. —RYAN PHILLIPS, 16, Montpelier, Vermont; BILLY CARTER, 14, Spartanburg, South Carolina

We're looking for a few good hints! Help K-POWER readers be all that they can be by sending us hints for your favorite games. We have all the Zork and Pac-Man hints we can handle, but we'll be glad to publish and pay \$10 for hints we've not heard of. Send them to Hint Hotline, c/o K-POWER, 730 Broadway, New York, NY 10003. Hints will not be considered for publication unless accompanied by full name, address, telephone number, and date of birth. (Note: the computer systems listed in brackets indicate the computer version the hints work for.)

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invite you to get in on the fishing.

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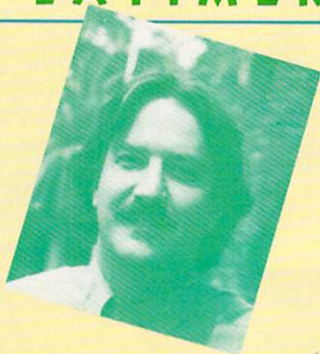
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MUSIC TIPS

MUSIC PROGRAMS BY JOEY LATIMER

No matter where you live, the picture of Santa and his reindeer on a snow-covered roof is a familiar image during the Christmas season. But while a real snow scene is regular winter fare in some parts of the world, people living in the tropics only dream of such a sight. A more realistic holiday scenario for these people might include Santa, clad in a red Hawaiian shirt and swimming trunks, trying to convince his reindeer to take off their sunglasses and get out of the pool. You see, after coming down out of the cold, the reindeer would be spoiled, and Santa might have a hard time persuading them to get back to work.

To help Santa with his plight, we at K-POWER have combined the best of both worlds, north and south, in a song. *Rudolph, the Red-Nosed Reggae* plays the old familiar standard with a new twist . . . a reggae beat. Our idea is that Rudolph will first be attracted to the beat and then, as he remembers the words, will realize what he and the other reindeer are supposed to be doing. We sure hope it works, because a red nose doesn't help much when the reindeer are wearing sunglasses at night.



ATARI 400/800, 600/800 XL, & 130XE/ *RUDOLPH, THE RED-NOSED REGGAE*

```
10 DIM B(255),H(255),M(255)
20 PRINT CHR$(125):POKE 752,1:SETCOLOR 2,3,2
30 POSITION 5,10:PRINT "RUDOLPH, THE RED-NOSED REGGAE"
40 FOR I=0 TO 255:B(I)=0:H(I)=0:NEXT I
50 FOR I=0 TO 255 STEP 8:READ B,M,H
60 B(I)=B:B(I+1)=B:B(I+2)=M:B(I+3)=M:B(I+6)=M
70 H(I+2)=H:H(I+3)=H:H(I+6)=H:NEXT I
80 C=0:FOR I=1 TO 122:READ T,D
90 FOR J=1 TO D:M(C)=T:C=C+1:NEXT J:NEXT I
```

```
100 FOR I=0 TO 255
110 SOUND 0,B(I),10,5:SOUND 1,H(I),10,5
120 SOUND 2,M(I),10,5:FOR D=1 TO 45:NEXT D
130 IF (I+6)/8=INT((I+6)/8) THEN SOUND 0,0,0,0
140 NEXT I:GOTO 100
1000 DATA 144,72,47,144,72,57,144,72,57,193,76,64
1010 DATA 193,76,64,193,76,64,193,76,64,144,72,47
1020 DATA 144,72,47,144,72,57,144,72,57,193,76,64
1030 DATA 193,76,64,193,76,64,193,76,64,144,72,47
1040 DATA 108,72,53,144,72,57,193,76,64,144,72,47
1050 DATA 193,76,64,193,76,64,128,72,64,193,76,64
1060 DATA 144,72,57,144,72,57,144,72,57,193,76,64
1070 DATA 193,76,64,193,76,64,193,76,64,144,72,47
2000 DATA 47,1,42,1,0,1,47,1,57,2,35,2
2010 DATA 42,2,47,4,0,2,47,1,42,1,47,1,42,1,47,2,35,2
2020 DATA 37,8,53,1,47,1,0,1,53,1,64,2,37,2
2030 DATA 42,2,47,4,0,2,47,1,42,1,47,1,42,1,47,2,42,2
2040 DATA 57,8,47,1,42,1,0,1,47,1,57,2,35,2
2050 DATA 42,2,47,4,0,2,47,1,42,1,47,1,42,1,47,2,35,2
2060 DATA 37,8,53,1,47,1,0,1,53,1,64,2,37,2
2070 DATA 42,2,47,4,0,2,47,1,42,1,47,1,42,1,47,2,31,2
2080 DATA 35,8,42,2,42,2,35,2,42,2,47,2,57,2,47,4
2090 DATA 53,2,42,2,47,2,53,2,57,8,64,2,57,2,47,2,42,2
2100 DATA 37,2,37,2,37,4,35,2,35,2,37,2,42,2
2110 DATA 47,2,53,2,64,4,47,1,42,1,47,1,47,1,57,2,35,2
2120 DATA 42,2,47,4,0,2,47,1,42,1,47,1,42,1,47,2,35,2
2130 DATA 37,8,53,1,47,1,0,1,53,1,64,2,37,2,42,2,47,4
2140 DATA 0,2,47,1,42,1,47,1,42,1,47,2,31,2,35,8
```



COMMODORE 64 & 128 (C 64 MODE)/ *RUDOLPH, THE RED-NOSED REGGAE*

```
10 DIM BH(255),BL(255),HH(255),HL(255)
20 DIM MH(255),ML(255)
30 S=54272:FOR I=0 TO 24:READ J:POKE I+S,J:NEXT I
40 PRINT CHR$(147):POKE 53281,2:POKE 53280,2
50 POKE 214,9:PRINT
60 PRINT CHR$(155);TAB(5);
70 PRINT "RUDOLPH, THE RED-NOSED REGGAE"
80 FOR I=0 TO 255
90 BH(I)=0:BL(I)=0:HH(I)=0:HL(I)=0:NEXT I
100 FOR I=0 TO 255 STEP 8
110 READ BH(I),BL(I),BH(I+2),BL(I+2),HH(I+2),HL(I+2)
120 BH(I+1)=BH(I):BL(I+1)=BL(I)
130 BH(I+3)=BH(I+2):BL(I+3)=BL(I+2)
140 BH(I+6)=BH(I+2):BL(I+6)=BL(I+2)
150 HH(I+3)=HH(I+2):HL(I+3)=HL(I+2)
160 HH(I+6)=HH(I+2):HL(I+6)=HL(I+2):NEXT I
170 C=0:FOR I=1 TO 122:READ TH,TL,D
180 FOR J=1 TO D:MH(C)=TH:ML(C)=TL:C=C+1
190 NEXT J:NEXT I
200 FOR I=0 TO 255
210 POKE S,BL(I):POKE S+1,BH(I)
220 POKE S+7,HL(I):POKE S+8,HH(I)
230 POKE S+14,ML(I):POKE S+15,MH(I)
240 IF (I+6)/8=INT((I+6)/8) THEN POKE S+4,32
250 FOR T=1 TO 50:NEXT T:POKE S+4,33
260 NEXT I:GOTO 200
1000 DATA 0,0,0,0,33,28,100,0,0,0,0,33,28
1010 DATA 100,0,0,0,0,33,28,123,0,0,0,15
2000 DATA 14,24,28,49,42,62,14,24,28,49,35,134,14,24
2010 DATA 28,49,35,134,10,143,26,156,31,165,10,143,26
2020 DATA 156,31,165,10,143,26,156,31,165,10,143,26
2030 DATA 156,31,165,14,24,28,49,42,62,14,24,28,49,42
2040 DATA 62,14,24,28,49,35,134,14,24,28,49,35,134,10
2050 DATA 143,26,156,31,165,10,143,26,156,31,165,10
2060 DATA 143,26,156,31,165,10,143,26,156,31,165,14
```


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```

2070 DATA 24,28,49,42,62,18,209,28,49,37,162,14,24
2080 DATA 28,49,35,134,10,143,26,156,31,165,14,24
2090 DATA 28,49,42,62,10,143,26,156,31,165,10,143,26
2100 DATA 156,31,165,15,210,28,49,31,165,10,143,26
2110 DATA 156,31,165,14,24,28,49,35,134,14,24,28,49
2120 DATA 35,134,14,24,28,49,35,134,10,143,26,156,31
2130 DATA 165,10,143,26,156,31,165,10,143,26,156,31
2140 DATA 165,10,143,26,156,31,165,14,24,28,49,42,62
3000 DATA 42,62,1,47,107,1,0,0,1,42,62,1,35,134,2,56
3010 DATA 99,2,47,107,2,42,62,4,0,0,2,42,62,1,47,107
3020 DATA 1,42,62,1,47,107,1,42,62,2,56,99,2,53,57
3030 DATA 8,37,162,1,42,62,1,0,0,1,37,162,1,31,165,2
3040 DATA 53,57,2,47,107,2,42,62,4,0,0,2,42,62,1,47
3050 DATA 107,1,42,62,1,47,107,1,42,62,2,47,107,2
3060 DATA 35,134,8,42,62,1,47,107,1,0,0,1,42,62,1,35
3070 DATA 134,2,56,99,2,47,107,2,42,62,4,0,0,2,42,62
3080 DATA 1,47,107,1,42,62,1,47,107,1,42,62,2,56,99,2
3090 DATA 53,57,8,37,162,1,42,62,1,0,0,1,37,162,1,31
3100 DATA 165,2,53,57,2,47,107,2,42,62,4,0,0,2,42,62
3110 DATA 1,47,107,1,42,62,1,47,107,1,42,62,2,63,75,2
3120 DATA 56,99,8,47,107,2,47,107,2,56,99,2,47,107,2
3130 DATA 42,62,2,35,134,2,42,62,4,37,162,2,47,107,2
3140 DATA 42,62,2,37,162,2,35,134,8,31,165,2,35,134,2
3150 DATA 42,62,2,47,107,2,53,57,2,53,57,2,53,57,4,56
3160 DATA 99,2,56,99,2,53,57,2,47,107,2,42,62,2,37
3170 DATA 162,2,31,165,4,42,62,1,47,107,1,0,0,1,42,62
3180 DATA 1,35,134,2,56,99,2,47,107,2,42,62,4,0,0,2
3190 DATA 42,62,1,47,107,1,42,62,1,47,107,1,42,62,2
3200 DATA 56,99,2,53,57,8,37,162,1,42,62,1,0,0,1,37
3210 DATA 162,1,31,165,2,53,57,2,47,107,2,42,62,4,0
3220 DATA 0,2,42,62,1,47,107,1,42,62,1,47,107,1,42
3230 DATA 62,2,63,75,2,56,99,8

```



MACINTOSH w/MICROSOFT BASIC 2.0/ RUDOLPH, THE RED-NOSED REGGAE

```

DIM B(255),H(255),M(255)
LOCATE 8,16
PRINT "RUDOLPH, THE RED-NOSED REGGAE"
WAVE 0,SIN
WAVE 1,SIN
WAVE 2,SIN
FOR I=0 TO 255
  B(I)=0
  H(I)=0
NEXT I
FOR I=0 TO 255 STEP 8
  READ B(I),B(I+2),H(I+2)
  B(I+1)=B(I)
  B(I+3)=B(I+2)
  B(I+6)=B(I+2)
  H(I+3)=H(I+2)
  H(I+6)=H(I+2)
NEXT I
C=0
FOR I=1 TO 122
  READ T,D
  FOR J=1 TO D
    M(C)=T
    C=C+1
  NEXT J
NEXT I
LOOP:
FOR I=0 TO 255
  SOUND WAIT
  SOUND B(I),4,,0
  SOUND H(I),4,,1
  SOUND M(I),4,,2
  SOUND RESUME
  IF I MOD 8 = 2 THEN SOUND 0,,2,,1
NEXT I
GOTO LOOP
REM --BASS AND HARMONY DATA--
DATA 466,932,698,466,932,587,466,932,587,349,880
DATA 523,349,880,523,349,880,523,349,880,523,349,880
DATA 932,698,466,932,698,466,932,587,466,932,587
DATA 349,880,523,349,880,523,349,880,523,349,880
DATA 523,466,932,698,311,932,622,466,932,587,349
DATA 880,523,466,932,698,349,880,523,349,880,523
DATA 261,466,523,349,880,523,466,932,698,466,932
DATA 587,466,932,587,349,880,523,349,880,523,349
DATA 880,523,349,880,523,466,932,698
REM --MELODY DATA--
DATA 1397,1,1568,1,0,1,1397,1,1175,2,1865,2
DATA 1568,2,1397,4,0,2,1397,1,1568,1,1397,1
DATA 1568,1,1397,2,1865,2,1760,8,1245,1
DATA 1397,1,0,1,1244,1,1047,2,1760,2,1568,2
DATA 1397,4,0,2,1397,1,1568,1,1397,1,1568,1
DATA 1397,2,1568,2,1175,8,1397,1,1568,1,0,1
DATA 1397,1,1175,2,1865,2,1568,2,1397,4,0,2
DATA 1397,1,1568,1,1397,1,1568,1,1397,2,1865,2
DATA 1760,8,1245,1,1397,1,0,1,1244,1,1047,2
DATA 1760,2,1568,2,1397,4,0,2,1397,1,1568,1
DATA 1397,1,1568,1,1397,2,2093,2,1865,8,1568,2
DATA 1568,2,1865,2,1568,2,1397,2,1175,2,1397,4
DATA 1244,2,1568,2,1397,2,1244,2,1175,8,1047,2
DATA 1175,2,1397,2,1568,2,1760,2,1760,2,1760,4
DATA 1865,2,1865,2,1760,2,1568,2,1397,2,1244,2
DATA 1047,4,1397,1,1568,1,0,1,1397,1,1175,2
DATA 1865,2,1568,2,1397,4,0,2,1397,1,1568,1
DATA 1397,1,1568,1,1397,2,1865,2,1760,8,1245,1
DATA 1397,1,0,1,1244,1,1047,2,1760,2,1568,2
DATA 1397,4,0,2,1397,1,1568,1,1397,1,1568,1
DATA 1397,2,2093,2,1865,8

```



IBM PC & COMPATIBLES*/RUDOLPH, THE RED-NOSED REGGAE

```

10 DIM B$(8),H$(8),M$(8)
20 KEY OFF:SOUND ON: BEEP OFF
30 CLS:LOCATE 10,23,0
40 PRINT "RUDOLPH, THE RED-NOSED REGGAE"
50 READ M$(0),M$(1),M$(3),M$(4),M$(5)
60 M$(2)=M$(0):M$(6)=M$(0):M$(7)=M$(3)
70 B$(0)="T150":H$(0)="T150"
80 FOR I=0 TO 7:FOR J=1 TO 4:READ X$,Y$,Z$
90 B$(I)=B$(I)+"01L4"+X$+"02L8"+Y$+Y$+"P4"+Y$+"P8"
100 H$(I)=H$(I)+"P402L8"+Z$+Z$+"P4"+Z$+"P8"
110 NEXT J:NEXT I
120 FOR I=0 TO 7
130 PLAY B$(I),H$(I),M$(I):NEXT I:GOTO 120
1000 DATA T15003L8FGP8FL4DA#GL2FP4L8FGFGL4FA#L1A
1010 DATA L8D#FP8D#L4CAGL2FP4L8FGFGL4FGL1D
1020 DATA L8D#FP8D#L4CAGL2FP4L8FGFGL4F04C03L1A#
1030 DATA L4GGAG#GFDL2FL4D#GFD#L1D
1040 DATA L4CDFGAAL2AL4A#A#AGFD#L2C
2000 DATA A#,A#,F,A#,A#,D,A#,A#,D,F,A,C
2010 DATA F,A,C,F,A,C,F,A,C,A#,A#,F
2020 DATA A#,A#,F,A#,A#,D,A#,A#,D,F,A,C
2030 DATA F,A,C,F,A,C,F,A,C,A#,A#,F
2040 DATA D#,A#,D#,A#,A#,D,F,A,C,A#,A#,F
2050 DATA F,A,C,F,A,C,F,A,C,A#,A#,F
2060 DATA A#,A#,D,A#,A#,D,A#,A#,D,F,A,C
2070 DATA F,A,C,F,A,C,F,A,C,A#,A#,F

```

*This program has been tested on the following computers and hardware configurations, using the BASICs shown: IBM PC w/TV or monitor w/speaker, w/Disk BASIC 2.00 or Advanced BASIC A2.00, IBM PCjr w/TV or monitor w/speaker, w/Cartridge BASIC J1.00, Tandy 1000 w/TV or monitor w/speaker, w/GW-BASIC 2.02 version 00.05.00.



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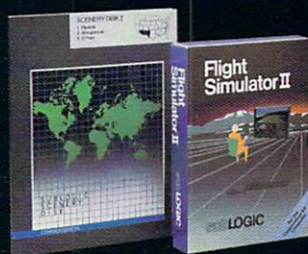
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APPLE II SERIES/JUGGER-NAUT

```

10 DF = 0.9:S = 0
20 HP = 18:HOME:PRINT TAB(13);"*JUGGER-NAUT*"
30 FOR I = 1 TO 20
40 PRINT TAB(12);CHR$(124);SPC(13);CHR$(124):NEXT I
50 POKE -16368,0:H = INT(RND(1)*13)+13:V = 2
60 HTAB 19:VTAB 22:PRINT "*"HTAB H:VTAB V:PRINT "^"
70 HTAB 15:VTAB 23:PRINT "SCORE:";S
80 K = PEEK(-16384):IF K < 128 THEN 160
90 POKE -16368,0:IF K <> 160 THEN 140
100 FOR I = 1 TO 20
110 IF HP = H-1 THEN HTAB H:VTAB V:PRINT CHR$(INT(RND(1)*27)+65)
120 SN = PEEK(-16336):NEXT I
130 IF HP = H-1 THEN DF = DF-0.1:S = S+1:GOTO 20
140 HP = HP-(K = 194 AND HP > 12)+(K = 206 AND HP < 24)
150 HTAB HP:VTAB 22:PRINT " * "
160 HTAB H:VTAB V:PRINT " "
170 V = V+(RND(1) > DF):Q = RND(1)
180 H = H-(Q < 0.5 AND H > 13)+(Q >= 0.5 AND H < 25)
190 HTAB H:VTAB V:PRINT "^^"
200 IF V < 22 THEN 80
210 PRINT CHR$(7);:DF = 0.9:S = 0:GOTO 20

```

COMMODORE 64 & 128 (C 64 MODE)/JUGGER-NAUT

```

10 DF=0.9:S=0:N=54272:FOR I=N TO N+23:POKE I,0:NEXT I
20 POKE N+24,15:POKE N+5,100:POKE N+6,100:POKE N+1,20
30 HP=18:PRINT CHR$(147);TAB(13);"*JUGGER-NAUT*"
40 FOR I=1 TO 20
50 PRINT TAB(12);CHR$(170);TAB(26);CHR$(180):NEXT I
60 H=INT(RND(1)*13)+13:V=1
70 POKE 214,20:PRINT:PRINT TAB(19);CHR$(177)
80 POKE 214,V:PRINT:PRINT TAB(H);CHR$(94)
90 POKE 214,21:PRINT:PRINT TAB(15);"SCORE:";S

```

```

100 GET K$:IF K$="" THEN 180
110 IF K$<>CHR$(32) THEN 160
120 POKE N+4,129+96*(HP=H-1):FOR I=1 TO 20
130 IF HP=H-1 THEN POKE 1024+(V+1)*40+H,INT(RND(1)*26)+1
140 POKE 53280,8:POKE 53280,14:NEXT I:POKE N+4,0
150 IF HP=H-1 THEN DF=DF-0.1:S=S+1:GOTO 30
160 HP=HP+(K$="B" AND HP>12)-(K$="N" AND HP<24)
170 POKE 214,20:PRINT:PRINT TAB(HP);" ";CHR$(177);" "
180 POKE 214,V:PRINT:PRINT TAB(H);" ";V=V-(RND(1)>DF)
190 Q=RND(1):H=H+(Q<0.5 AND H>13)-(Q>=0.5 AND H<25)
200 POKE 214,V:PRINT:PRINT TAB(H);CHR$(94)
210 IF V<20 THEN 100
220 POKE N+4,17:FOR I=1 TO 500:NEXT I:POKE N+4,0
230 DF=0.9:S=0:GOTO 30

```

IBM PC & COMPATIBLES*/JUGGER-NAUT

```

10 WIDTH 40:KEY OFF:DF=.9:S=0
20 HP=18:CLS:PRINT TAB(13);"*JUGGER-NAUT*"
30 FOR I=1 TO 20
40 PRINT TAB(12);CHR$(124);SPC(13);CHR$(124):NEXT I
50 H=INT(RND*13)+13:V=2
60 LOCATE 22,19,0:PRINT CHR$(207)
70 LOCATE V,H:PRINT CHR$(157)
80 LOCATE 23,15:PRINT "SCORE:";S
90 K$=INKEY$:IF K$="" THEN 170
100 IF K$<>CHR$(32) THEN 150
110 FOR I=1 TO 10
120 IF HP=H-1 THEN LOCATE V,H:PRINT CHR$(INT(RND*27)+65)
130 SOUND 50,.5:NEXT I
140 IF HP=H-1 THEN DF=DF-.1:S=S+1:GOTO 20
150 HP=HP+((K$="B" OR K$="b") AND HP>12)-((K$="N" OR K$="n") AND HP<24)
160 LOCATE 22,HP:PRINT " ";CHR$(207);" "
170 LOCATE V,H:PRINT " ";V=V-(RND>DF):Q=RND
180 H=H+(Q<.5 AND H>13)-(Q>=.5 AND H<25)
190 LOCATE V,H:PRINT CHR$(157)
200 IF V<22 THEN 90
210 PRINT CHR$(7);:DF=.9:S=0:GOTO 20

```

*This program has been tested and found to run on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Disk BASIC D2.00 or Advanced BASIC A2.00, IBM PCjr w/Cassette BASIC C1.20 or Cartridge BASIC J1.00, Tandy 1000 w/GW-BASIC 2.02 version 00.05.00.

CONTEST IDEA CONTEST



"... So, Alex, what's a good idea for January's contest?"

"Beats me, Damon. It's got to be better than that 'Name That Book Contest.' Yech!"

"I know! We could say that we have a jar of jellybeans here in the office, and have people guess how many jellybeans are in the jar!"

"C'mon, Dave."

"Wait a minute! Maybe we could have a 'Contest Idea Contest.' We'd say that we're really sorry about the 'Book Contest,' but we're just about out of ideas. People could send in ideas for a contest. We'd pick the best three and use them in the magazine. What do you think?"

"That's so crazy, it just might

work! Let's do it!"

"I still like my jellybean idea."

"C'mon, Dave . . ."

Just fill in the entry blank and mail it to "Contest Contest," c/o K-POWER, 730 Broadway, New York, New York 10003. The best three entries will be used in the magazine, and the creators will receive \$25 each. Good luck!

Name _____ Date of Birth _____
 Address _____
 City _____ State _____ Zip _____
 Telephone (____) _____ Sex _____
 Computer(s) I use _____
 My Contest Idea is _____

[This isn't just hype. We really do have the money.]

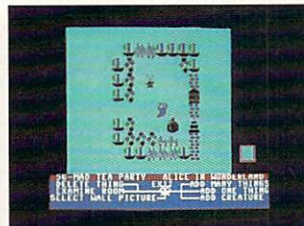
WANTED:

WORLD'S GREATEST ADVENTURES.

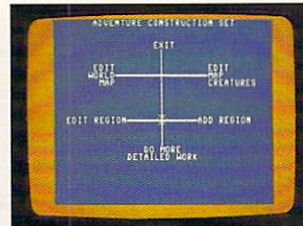
REWARD: \$1000 and FAME. CALL (800) 227-6703.



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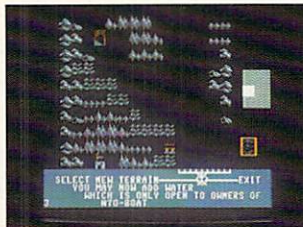
Or make your own parts from scratch. Draw 'em. Give 'em properties. Go for it!



ACS is menu driven. It works with a positive "stick shift" controller. Easy as pie!



Ready-made segments of sci-fi, mystery & dragon-type adventures included! A real bargain!



Mountains, oceans, forests & etc. are pre-built. Or make your own landscapes. You're the boss!



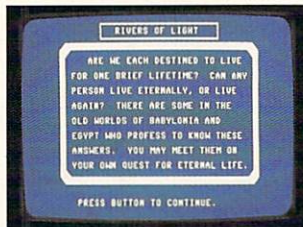
Amazing fact #1: ACS makes adventures (& finishes parts of yours) by itself. This is No Lie!



Music modules & sound effects included. Score your adventures like movies. Be a maestro!



No arms control here! Endless weapons of your design. (Endless armor & cures, fortunately)



Complete, top-notch epic adventure included: Rivers of Light by Stuart Smith, author of Ali Baba!



500 obnoxious creatures thrown in! Or make your own. Put 'em at the population! See their priorities!



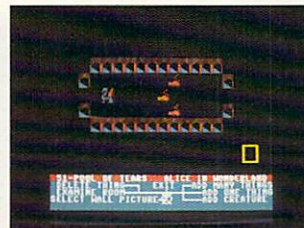
You get magic! 31 variations on 15 Big Spells! You get technology. You get religion. All right!



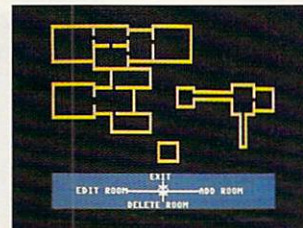
Amazing fact #2: ACS integrates text and graphics. All other products wimp out in this regard.



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WHAT'S IN STORE

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. Unless otherwise noted, all programs are in disk format.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system, in the games reviews, the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS & PRODUCTIVITY

| Title Manufacturer Price | Brief description | Hardware/ Equipment required | Backup policy | Ratings | | | | | |
|--|---|---|--|------------------|------------------|------------------|-----|----|------------------|
| | | | | O | D | EH | GQ | EU | V |
| EXPRESS LETTER PROCESSOR Mirage Concepts, Inc. 4055 W. Shaw Ave., Suite 108 Fresno, CA 93711 (209) 227-8369 \$50 © 1985 | Combines a rudimentary word processor with a simple data base. You can write letters, then merge the text with information from a mailing list you create. Remove one star in ratings for Mac version. Easy, but not flexible. † —RASKIN | Reviewed on IBM PC. Also for Atari 520ST; IBM XT/PCjr or compatibles; 128K Macintosh. | 90-day warranty; user makes backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | N/A | E | ★ ★ ★ |
| OVERVUE 2.0 ProVUE Development Corp. 222 22nd St. Huntington Beach, CA 92648 (714) 969-2431 \$295 © 1985 | The data base disguised as a spreadsheet: everything appears in rows and columns. Offers blinding speed and a wide variety of options, including relational abilities that let you combine files. † —AKER | 128K Macintosh. Printer recommended. | Unlimited warranty; user makes backup. | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | N/A | A | ★ ★ ★ ★ |
| TRIO Softsync, Inc. 162 Madison Ave. New York, NY 10016 (212) 685-2080 \$70 (C 64/128); \$100 (Apple) © 1985 | Integrates word processor, data base, and spreadsheet, merging information from the latter two into the word processor. For small business owners, students, or families with limited needs, time, or money. Performed well. † —AMATO | Reviewed on C 64. Also for 128K Apple; C 128. | 90-day warranty; \$7 thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | N/A | A | ★ ★ ★ |
| WRITE 'N SPELL Professional Software, Inc. 51 Fremont St. Needham, MA 02194 (617) 444-5224 \$149 © 1985 | Logical commands make this word processor easy to use. Terrific features include 90,000-word spelling checker, ability to merge files from most other word processors, and capacity to print one file while you work on another. † —TAETZSCH | Reviewed on 256K IBM PC. Also for IBM XT/PCjr and compatibles. | 90-day warranty; user makes backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | N/A | E | ★ ★ ★ |
| ZBANNER + ZAZDA 10008 E. 83rd Terrace Raytown, MO 64138 (816) 358-5065 \$50 © 1985 | By printing sideways, lets you create long banners on fanfold paper. Includes 24 sample banners in 16 character sizes, ready to be customized—or make your own. A great gift. —BUMGARNER | Reviewed on IBM PCjr. Also for IBM PC/XT and compatibles. | Unlimited warranty. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | N/A | 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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SOFTWARE GUIDE

EDUCATION/FUN LEARNING

| Title Manufacturer Price | Brief description | Hardware/ Equipment required | Backup policy | Ratings | | | | | |
|--|---|---|--|------------------|------------------|------------------|------------------|----|------------------|
| | | | | O | D | EH | GQ | EU | V |
| THE BODY IN FOCUS CBS Software One Fawcett Place Greenwich, CT 06836 (203) 622-2500 \$40 © 1985 | Explore the body's systems, as excellent animated graphics show the heart pumping, the arm muscles working, and more, with single-key control. An all-time favorite at our house. † —MORRIS | Reviewed on 48K Apple. Also for C 64; IBM PC. Color monitor recommended. | 90-day warranty; \$5 thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| CLIP ART COLLECTION: VOLUME 1 Springboard Software, Inc. 7808 CreekrIDGE Circle Minneapolis, MN 55435 (612) 944-3912 \$30 © 1985 | Provides over 600 new pieces of art for <i>The Newsroom</i> , making the original program more useful. Contains sports, musical instruments, food, famous buildings, a blank calendar, and lots more. A welcome addition. —FRANK | Reviewed on 48K Apple. Also for IBM PC and compatibles. | 30-day warranty; \$5 thereafter. \$12 for backup. | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | E | ★ ★ ★ ★ |
| CREATIVE CONTRAPTIONS Bantam Software 666 Fifth Ave. New York, NY 10103 (212) 765-6500 \$40 © 1985 | This construction set mixes and matches simple mechanisms with zany objects to create Rube Goldberg-like devices. Several levels of play offer challenges for many sessions. For ages 7+. —BUMGARNER | Reviewed on 48K Apple. Also for IBM PC/PCjr and compatibles. | 90-day warranty; \$5 thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| THE FLYING CARPET Panda/Learning Technologies, Inc. 4255 LBJ Freeway Suite 131 Dallas, TX 75244 (214) 991-4958 \$20 © 1985 | A genie on a flying carpet produces objects made from various geometric shapes. A good exercise in shape recognition for kids 3-6, but is limited by only one difficulty level. —FRANK | Reviewed on 48K Apple. Also for C 64. | Unlimited warranty for original purchaser only. \$10 for backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ ★ ★ |
| THE RAILROAD WORKS CBS Software <i>(see above for address and phone)</i> \$10 © 1985 | Create model railroad layouts with multiple trains and scenery. Then run your trains to handle as much cargo as possible. An exciting idea that falls short of potential, with poor documentation. —MORRIS | Reviewed on 48K Apple. Also for C 64; IBM PC/PCjr and compatibles. Joystick optional. | 90-day warranty; \$5 thereafter. | ★ ★ | ★ ★ | ★ ★ | ★ ★ | A | ★ ★ ★ |
| ROAD RALLY U.S.A. Bantam Software <i>(see above for address and phone)</i> \$40 © 1985 | A fun geography and map-reading game for ages 10 to adult. Choose one of seven regions, then find the correct route to your destination without succumbing to obstacles. † —BUMGARNER | Reviewed on 48K Apple. Also for IBM PC/PCjr and compatibles. | 90-day warranty; \$5 thereafter. | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | A | ★ ★ ★ ★ |
| SLIDING BLOCK Panda/Learning Technologies, Inc. <i>(see above for address and phone)</i> \$20 © 1985 | Like those little sliding-number puzzles, but this uses pictures. Not only is this fun, it also helps kids 8 and up develop problem-solving techniques. † —BUMGARNER | Reviewed on C 64. Also for 48K Apple. | Unlimited warranty for original purchaser only. \$10 for backup. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D | ★ ★ ★ |
| SUCCESS WITH ALGEBRA Series CBS Software <i>(see above for address and phone)</i> \$35 each © 1985 | A set of five, separately sold packages; each addresses one aspect of high school algebra. Makes easy to understand what takes weeks in class, but there are problems with boredom and repetition. † —MORRIS | Reviewed on 48K Apple. Also for C 64; IBM PC/PCjr. | 90-day warranty; \$5 thereafter. | ★ ★ | ★ ★ | ★ ★ | N/A | A | ★ ★ |
| THINK-FAST BrainPower, Inc. 24009 Ventura Blvd. Calabasas, CA 91302 (818) 884-6911 \$40 © 1985 | This challenging game tests short-term memory, but has many drawbacks, such as failing to teach how to transfer information to long-term memory. Questionable assertions mar program. —MORRIS | Reviewed on 64K Apple. Also for Macintosh. Joystick recommended. | 90-day warranty; \$10 thereafter; user makes backup. | ★ ★ | ★ ★ | ★ ★ | ★ ★ | 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

SOFTWARE GUIDE

GAMES REVIEWS BY JAMES DELSON

| Title Manufacturer Price | Brief description | Hardware/ Equipment required | Backup policy | Ratings | | | | | |
|---|--|--|--|---------|---|----|-----|----|---|
| | | | | O | D | PS | GQ | EU | V |
| CIRCUS MAXIMUS Avalon Hill 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 \$25 © 1985 | Would-be "Ben-Hurs" will enjoy this chariot-racing game. 1-12 players, ages 10+, build their own 4-horse chariots, then go to the Colosseum to take on all comers. | Reviewed on IBM PC. Also for IBM XT/PCjr. Color graphics board required. | 90-day warranty; \$10 thereafter or for backup. | ★ | ★ | ★ | ★ | E | ★ |
| COLONIAL CONQUEST Strategic Simulations, Inc. 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$40 © 1985 | My choice as the best game of the year, this political/economic/military simulation is easy to learn, but impossible to master. Suitable for 1-6 players ages 12 and up.† | Reviewed on C 64. Also for Atari. Joystick. | 30-day warranty; \$10 thereafter. \$12 for backup. | ★ | ★ | ★ | ★ | A | ★ |
| THE COSMIC BALANCE Strategic Simulations, Inc. (see above for address and phone) \$40 © 1982 | Ship-to-ship combat in outer space. 1-2 players build a spacecraft, then send it into 6 danger situations. Will accept ships from <i>Cosmic Balance II</i> ; for ages 12+. | Reviewed on 48K Apple. Also for Atari; C 64. | (see above) | ★ | ★ | ★ | ★ | A | ★ |
| HOT WHEELS Epyx 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$29-\$35 © 1985 | Choose a car or build your own. Then drive it around town or enter a demolition derby. For younger kids only, ages 4-10; adults would quickly get bored with it. | C 64. Joystick. | 90-day warranty; \$5 thereafter. | ★ | ★ | ★ | ★ | E | ★ |
| JET subLOGIC 713 Edgebrook Drive Champaign, IL 61820 (217) 359-8482 \$50 © 1985 | The "sonic boom" of flight simulators, this jet fighter's control system allows take off, landing, dog fights, aerobatics, and bombing missions; all in 3-D! For those 12+. | IBM PC/PCjr. Requires graphics adapter on PC. Joystick optional. Planned for C 64. | 6-month warranty; \$5 thereafter. \$10 for backup. | ★ | ★ | ★ | ★ | D | ★ |
| MICRO LEAGUE BASEBALL Micro League Sports Association 28 E. Cleveland Ave. Newark, DE 19711 (302) 368-9990 \$40 © 1984 | Uses famed baseball teams from the past to create "what-if" games. You choose lineup and pitcher, then act as manager. Awkward play system, but good graphics and fast play will appeal to fans 8 or older.† | Reviewed on 48K Apple. Also for Atari; C 64; IBM PC/PCjr. | Unlimited warranty; \$10 if user-damaged. | ★ | ★ | ★ | ★ | E | ★ |
| RAM! Avalon Hill (see above for address and phone) \$30 © 1984 | A clever simulation of naval combat in the Peloponnesian War. Lets solitaire gamers 10+ play individual scenarios, an entire campaign, or hypothetical battles. | Reviewed on IBM PC/PCjr. Also for IBM compatibles. | 90-day warranty; \$10 thereafter or for backup. | ★ | ★ | ★ | ★ | A | ★ |
| SORCERER Infocom 55 Wheeler St. Cambridge, MA 02138 (617) 492-1031 \$40-\$45 © 1984 | This follow-up to <i>Enchanter</i> takes an experienced player through a do-or-die text adventure. Tests intuitive and puzzle-solving abilities in an amusing fantasy. For ages 12+. | Reviewed on 48K Apple. Also for Atari; C 64; IBM PC/PCjr; TI-99/4A; Tandy Model III. | 90-day warranty; \$5 thereafter. | ★ | ★ | ★ | N/A | D | ★ |
| SPACE SHUTTLE Activision 2350 Bayshore Frontage Road Mountain View, CA 94039 (415) 960-0410 \$25-\$40 © 1983 | Fascinating and exhilarating solitaire space shuttle simulation. Choose difficulty level, then take off, go into orbit, locate and dock with satellite, and return to Earth. Fun for ages 10+. | Reviewed on C 64. Also for Apple; Atari; C 128. Joystick. | One-year warranty. | ★ | ★ | ★ | ★ | A | ★ |
| SUMMER GAMES II Epyx (see above for address and phone) \$29-\$35 © 1985 | Even tougher than last year's hit, <i>Summer Games</i> . 1-8 players can compete in single events, whole series, or combine this one with the original. One of the best for ages 8+. | C 64. Joystick(s). | 90-day warranty; \$5 thereafter. | ★ | ★ | ★ | ★ | A | ★ |

RATINGS KEY O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

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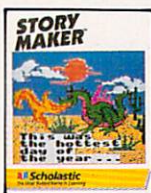
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WHAT'S IN STORE

SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 90 for information such as backup policies and addresses of software manufacturers.

HOME BUSINESS & PRODUCTIVITY

Express Letter Processor

HARDWARE REQUIREMENTS: Reviewed on IBM PC/PCjr. Also for Atari 520ST; 128K Macintosh.
MANUFACTURER: Mirage Concepts, Inc.
PRICE: \$50

Yipes! It's time for your monthly business flyers or yearly Christmas cards to go out, and the thought of hand-addressing a hundred envelopes leaves you cold. On the other hand, the thought of mastering a complicated data base or mail-merge operation is not especially appealing either. Try *Express*, a new and inexpensive program tailor-made for these situations.

Combining a rudimentary word processor with a simple data base manager, *Express* was designed for writing short documents and letters, then merging the text with information from a mailing list.

Using a simple template, you make up the mailing list by filling out electronic index cards containing spaces for each person's name, title, address, and phone number, plus a salutation. Then, insert the information, or portions of it, into the text just before printing. You can send letters to one or many on your list. Simple matching is also allowed. For example, you can send letters to all the Smiths on your list, or to those from Virginia only. However, you can't alter the mailing list form or add any new categories.

In another mode, *Express* types directly to the printer; it's terrific for quickly filling out forms. Printing is a snap because the templates for mailing lists, labels, and envelopes are included as utility programs.

What you don't get with *Express* is flexibility. The word processing commands are few and simple. There's no way to access headers, footers, columned text, or even the undo or search and replace features. The sort capabilities of the mail merge are adequate, but primitive.

Express is easy to learn, however, and does the short, simple jobs well.

Complex jobs may require a different approach.

Unfortunately, the Macintosh version of this program doesn't make very good use of that machine's mouse or pull-down menus. It seems as though the program was ported over in a hurry, although an improved version is promised. For now, remove one star in the ratings for the Mac version. —ROBIN RASKIN

OverVUE 2.0

HARDWARE REQUIREMENTS: Reviewed on 128K Macintosh.
MANUFACTURER: ProVUE Development Corp.
PRICE: \$295

OverVUE is a data base disguised as a spreadsheet: Everything appears in rows and columns. Each record (the data base equivalent of an index card) occupies a single row; you scroll horizontally when necessary. Every column contains a category within each record.

While an alternate screen gives a view of one record at a time in your chosen format—mailing label, for instance—the row-and-column design lets you quickly scan and manipulate records. *OverVUE* also offers blinding speed, since both the program and your information are in memory at all times.

There's an almost bewildering variety of options, but the excellent manual will take you through them. Among the many special features is clairvoyance! Once you enter three characters of information in any category, *OverVUE* will complete the entry if you've used the same data in the same category in another record. To override this feature, all you need to do is keep typing; the program will continue to suggest matches according to the additional characters entered.

OverVUE's complete search and sort capabilities include an especially convenient function that sorts records in any column, then automatically groups them for subtotals and grand totals. If you keep checkbook information with this data base (another function, running total, makes that ideal), you can easily get totals for child care expenses, medical bills, etc., as long as you identify each expense when entering it.

The program's relational abilities let you combine two files if they have one category in common. If you need to keep track of phone calls for business expenses, say, you can merge

your phone bill file with your name-address-phone file; the common link is the phone number category.

The original release was good to start with, but this 2.0 version offers even more. *OverVUE* falls short only in its printer options: Mac users are spoiled when it comes to choosing fonts and styles for printing, and *OverVUE* offers neither. But, with great speed and a wealth of features, you won't mind the no-frills printout. —SHARON ZARDETTO AKER

TRIO

HARDWARE REQUIREMENTS: Reviewed on C 64. Also for 128K Apple IIe/IIc; C 128.
MANUFACTURER: Softsync, Inc.
PRICE: \$70 (C 64/128); \$100 (Apple)

Integrated software appeals to two types of people: the practical and the cost-conscious. Practical people don't want to reenter the same information from a spreadsheet or data base into a word processor. Cost-conscious folks look for the capabilities of three (or more) functions for the price of one. *TRIO* combines a word processor, a spreadsheet, and a data base, and integrates information from the latter two into the word processor.

*TRIO*WORD* holds about eight pages, sufficient for letters and short reports. The cells (individual items) in *TRIO*CALC* are enough for a yearly budget or for figuring out the profit and loss from a small business. *TRIO*FILE* would be good for simple list-keeping, name and address files, or home library records.

In applying for a loan, for example, the more professional the presentation, the more likely its approval. You can create incoming and outgoing financial projections using *TRIO*CALC* and insert them into a letter listing your credit history. Then add a list of references stored in the *TRIO*FILE* data base. Of course, this can be done by hand. But which is a more impressive presentation (and faster, too)?

Other than two minor flaws, *TRIO* performed well. One flaw is that you must specify at the outset how long (from 100 to 400 lines) a document will be. These lines must include space for any information you may want to merge later from the other modules. Solve this minor inconvenience by chaining files together. Mathematical formulas used in *TRIO*CALC* also could have been easier to

However, drawbacks mar the series. In almost every case, once you boot up, there is no way to back up until you reach the end. At times instructions are less than helpful. This is compounded by odd inconsistencies between the several disks. On-line help is sometimes available, sometimes not. And at the end of a set of problems, you are usually given the option of working more or quitting, but one package simply quits after the first sequence.

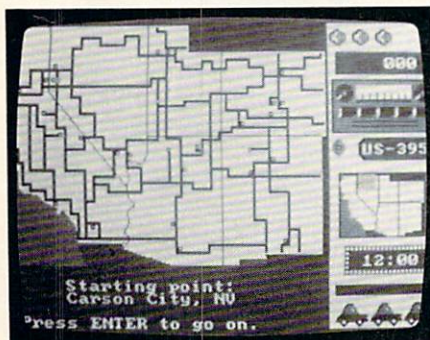
All my children commented on problems of boredom and repetition. Anne noted that students who "are already behind in algebra aren't likely to be motivated by this material . . . repetition would only discourage them." Jon pointed out that since the disks presume familiarity with the principles of algebra, "unless you already have some experience with these ideas, it will be . . . hard to follow."

Since each package deals with a narrow content area, the \$175 total cost seems inordinately steep. But there's some value here for the committed student.

—TONY MORRIS

Road Rally U.S.A.

HARDWARE REQUIREMENTS: Reviewed on 48K Apple. Also for IBM PC/PCjr.
MANUFACTURER: Bantam Software
PRICE: \$40
MANUFACTURER'S SUGGESTED AGE: 10+



In *Road Rally U.S.A.*, a geography and map-reading game, the continental United States is divided into seven regions, each depicted on a colorful, durable map card.

After a player chooses a region, the program names a destination. You can drive there using a keyboard or joystick. Don't run out of gas or succumb to too many obstacles, such as falling trees or landslides, or you won't reach your goal. Close-ups of each map-card area appear on-screen as you move about, so reading roadmaps becomes easy. →



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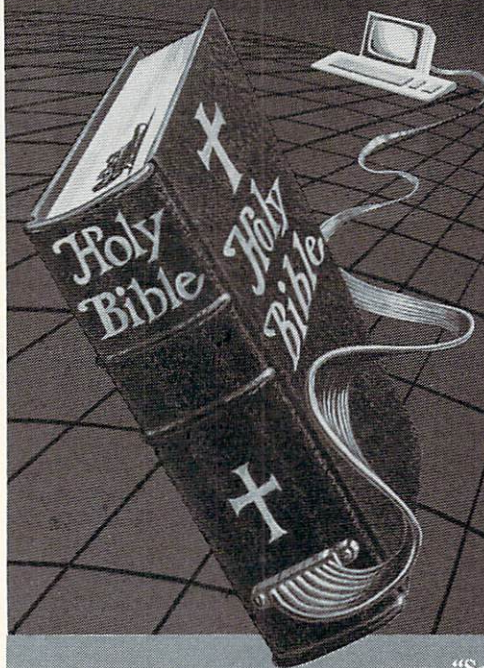


RANDOM HOUSE
Software

* For Apple II; IIe, IIc with 64K, Commodore 64, IBM PC, PCjr, & XT.
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WHAT'S IN STORE SOFTWARE REVIEWS

At higher levels of play, destinations are described, but not named. Research your journey just as my 8th-grade daughter did, by gathering facts from the backs of the map cards. She learned about places such as Lake Okeechobee, which "feeds the gigantic swamp, the Everglades."

You'll need to travel via the shortest route and stop at strategically placed gas stations to arrive at your destination as efficiently as possible. The more quickly you visit the various locations and the less mistakes you make, the higher your score.

Our whole family enjoyed *Road Rally U.S.A.*, learning many useful facts about other areas of America. I'd say the manufacturer's suggested age of 10 and up is right.

—MARLENE ANNE BUMGARDNER

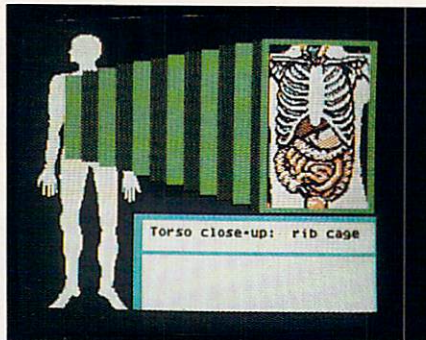
The Body in Focus

HARDWARE REQUIREMENTS: Reviewed on 48K Apple. Also for C 64; IBM PC.

MANUFACTURER: CBS Software

PRICE: \$40

MANUFACTURER'S SUGGESTED AGE: 10+



Watch the heart pump blood. Look inside a nose during a sneeze or an ear responding to sounds. Discover the world under your skin as you view the bones, muscles, and organs of the human body.

No, this isn't "Anatomy 101," but *The Body in Focus*, a superb software package that has quickly earned a place on the short list of all-time favorites at our house.

The program consists of three activities. *Body Systems* sets you off on an exploration of the eight major body systems, such as the respiratory, circulatory, and digestive systems. *Body Close-Ups* probes more deeply by peeling away one layer after another while examining the head, an arm, and the torso. Finally, *Body IQ* tests your knowledge.

After viewing one part of the body, you can read about it in depth as

needed. This increases the program's effectiveness in a family with differing levels of interest. For absolute simplicity, a vinyl keyboard overlay is included so you never need more than a single keystroke.

A wealth of detail graces *The Body in Focus*. In the excellent animated graphics, for example, you literally see the arm muscles contract and relax. The manual, however, is merely adequate. And it's too bad only three anatomical close-ups are provided. But these are truly minor concerns with an otherwise outstanding software program.

—TONY MORRIS

Sliding Block

HARDWARE REQUIREMENTS: Reviewed on C 64. Also for 48K Apple.

MANUFACTURER: Panda/Learning Technologies, Inc.

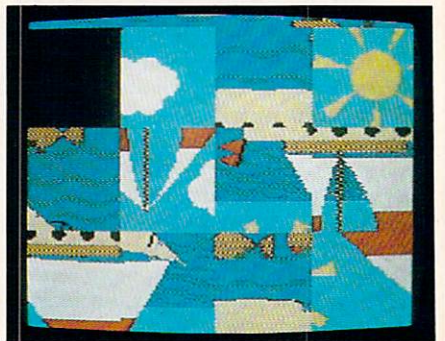
PRICE: \$20

MANUFACTURER'S SUGGESTED AGE: 8+

Remember those little plastic puzzles in which you slide numbered squares around in a frame? *Sliding Block* is based on the same principle, except now the frame contains a picture.

The disk holds four beautiful graphics. Each is scrambled into five to 24 pieces, depending on the level you select. As in the plastic version, you move each block in turn into a blank space until you successfully rearrange all the squares. Then the blank space fills in, and the picture is complete.

Developing the problem-solving techniques needed to work this type of puzzle isn't always easy. My nine-year-old son, not known for his patience, needed a few pointers to help him persist in the challenge. It helped to stop for dinner when he got stuck. After the break, he could see the solution. Some children may need to watch you struggle with the puzzle before understanding the need to move blocks in groups. That sometimes means taking apart sec-



tions that have been already carefully pieced together.

I love to see computer applications in which graphics and color serve as excellent motivators. *Sliding Block* can be difficult, yet it lets kids gradually challenge themselves; and the answer is self-rewarding.

—MARLENE ANNE BUMGARNER

GAMES

Micro League Baseball

HARDWARE REQUIREMENTS: Reviewed on 48K Apple. Also for Atari; C 64; IBM PC/PCjr.

MANUFACTURER: Micro League Sports Association

PRICE: \$40

CRITIC'S SUGGESTED AGE: 8+

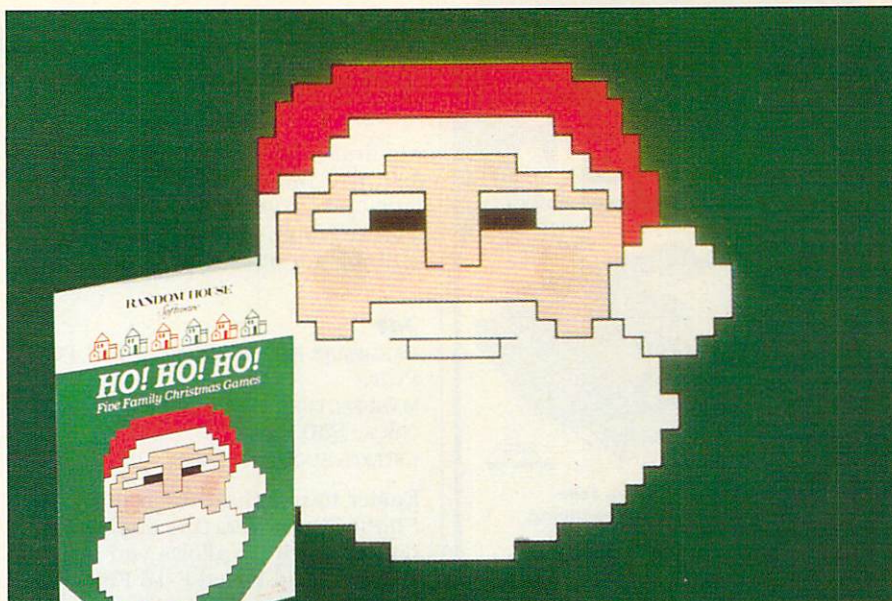


Micro League Baseball posits the notion that you can take real baseball teams of the past and present, or imaginary teams of major league greats, then, using their established statistics, manage an exciting computer simulation of the game.

One to two players create "what-if" games, choosing from a large roster of historic players. As the manager, you pick your team's lineup and starting pitcher, then determine strategy throughout the nine or more innings.

However, strategy is reduced since most batters get only one pitch, as contrasted to real baseball. For instance, the count may arbitrarily start at three balls and two strikes. It's also important to keep in mind that while gamers must look at a ballplayer's stats to determine strategy, those stats never change from game to game. Some fans may long for computer-updated stats, while others may prefer the stats frozen in time to better reflect the history of a ballplayer's skills.

Although the *Micro League* game is fun—even exciting—the play system's limitations prevent it from be-



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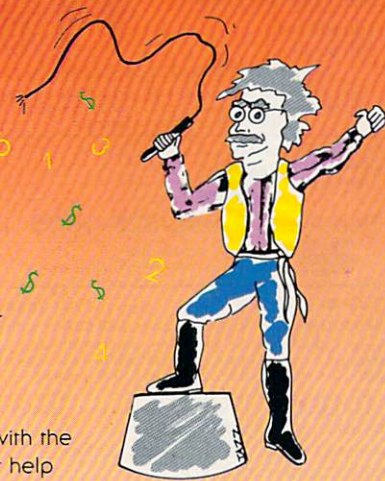
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WHAT'S IN STORE SOFTWARE REVIEWS

ing first-rate. Good graphics and fast play-time will appeal to sports fans and action gamers, but strategic thinking is severely restricted. Suitable for ages 8 on up.

Jet

HARDWARE REQUIREMENTS: IBM PC/PCjr.

MANUFACTURER: subLOGIC

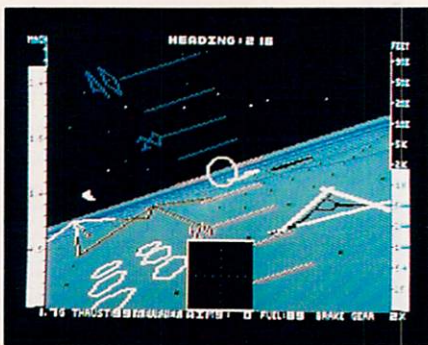
PRICE: \$50

CRITIC'S SUGGESTED AGE: 12 +

Easier to use than the original *Flight Simulator*, this superb jet fighter mock-up allows you to pilot either a land-based F-16 Fighting Falcon or a Navy F-18 Hornet. Fly either plane using a joystick or keyboard, with full-screen display of instruments.

You take off (or are catapulted off the deck of a carrier, in the case of the Navy's Hornet), land, participate in dog fights and aerobatics, and go on high-risk bombing runs. The fighters can be armed with short- and long-range missiles and guided and dead-weight bombs, as well as with 20mm cannon for use against MiGs.

Special features include 360-degree radar, a view in all directions



through the windscreen while aloft, variable magnification to better see distant targets, and an ejection seat to use if you're shot down. There's also a reverse point-of-view that allows you to see your jet as the control tower does.

All of this takes place in real time with 3-D graphics. The folks at subLOGIC have done it again, topping their original simulator with the best flight program yet.

One warning: The intense combination of combat and high-speed flight may demand too long an attention span for some players, especially very young ones. They'd be better off with the slower-paced original. Otherwise, *Jet* is the year's best in its field for ages 12 on up.

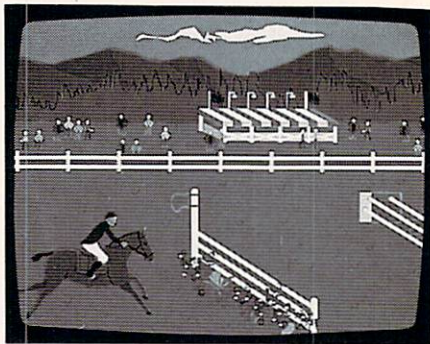
Summer Games II

HARDWARE REQUIREMENTS: Reviewed on C 64. Also for 64K Apple.

MANUFACTURER: Epyx

PRICE: \$29-\$35

CRITIC'S SUGGESTED AGE: 8 +



Multiplayer, multievent sports simulations are few and far between, yet they're among the most popular we've played. Starting with *Microsoft Decathlon* and continuing last year with *Summer Games* and *The Acti-vision Decathlon*, they always get a warm welcome. Well, good news, sports fans. *Summer Games II* is here, and it's even tougher than the original hit program.

This new series of Olympic events includes the triple jump, fencing, equestrian show-jumping, bicycling, the high jump, white-water kayaking, and single sculls. After practicing an event as many times as desired, one to eight players compete in individual events or the whole series. Players can even create an Olympian evening at home by combining this game with its predecessor.

Choose to represent one of 18 countries, each with its own flag. Bright and visually exciting, the opening and closing ceremonies are novel at first but get repetitive. Most of the events are easy enough, but achieving any degree of expertise takes a lot of practice.

In a list of good games for groups ages 8 and up, this counts as one of the year's best. (Another Olympic simulation, *Winter Games*, will be reviewed in next month's issue.)

Colonial Conquest

HARDWARE REQUIREMENTS: Reviewed on C 64. Also for Atari.

MANUFACTURER: Strategic Simulations, Inc.

PRICE: \$40

MANUFACTURER'S SUGGESTED AGE: 12 +

Colonial Conquest is, in my mind,

the most compelling, provocative, and intriguing program of the year. It combines the best elements of *Diplomacy*, *Geopolitique 1990*, *Incunabula*, and the board game *Risk* into a political/economic/military simulation, creating a one- to six-player game which is easy to learn but impossible to master.

Action is fast and nonstop as the Great Powers, circa 1880—England, France, Germany, Russia, Japan, and the United States—struggle to control the world.

Gamers employ a play system that's an improved variation of the games mentioned above. They take turns spying on one another, bribing each other and minor countries for support, and staging military coups. Players invade by land or by sea to establish colonies, then build fortified defense zones, raise armies and fleets, and even sue for peace by paying war compensation.

As each person takes a turn at the screen to enter orders, the remaining powers can plot against that player or against each other, make treaties, lie about their intentions, read declarations, and generally act



as if they owned the world (which is, after all, what the game is all about).

Each computer-controlled power can have its difficulty rating independently set, providing serious challenges for novices and experts alike. The game system, designed by Dan Cermak, contains the most sophisticated set of programmed opponents we've encountered since *Rails West!*

In case you haven't already guessed, *Colonial Conquest* is my choice as best game for 1985, and a must for every serious gamer 12 and older. (See next month's Games column for all the best games of '85.)

—REVIEWS BY JAMES DELSON

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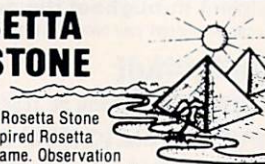
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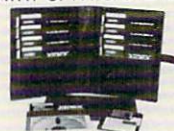
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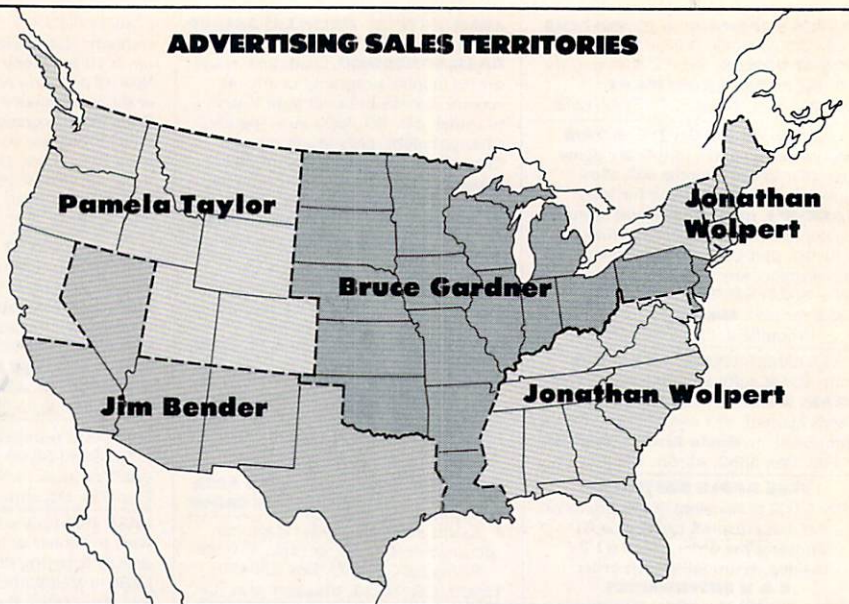
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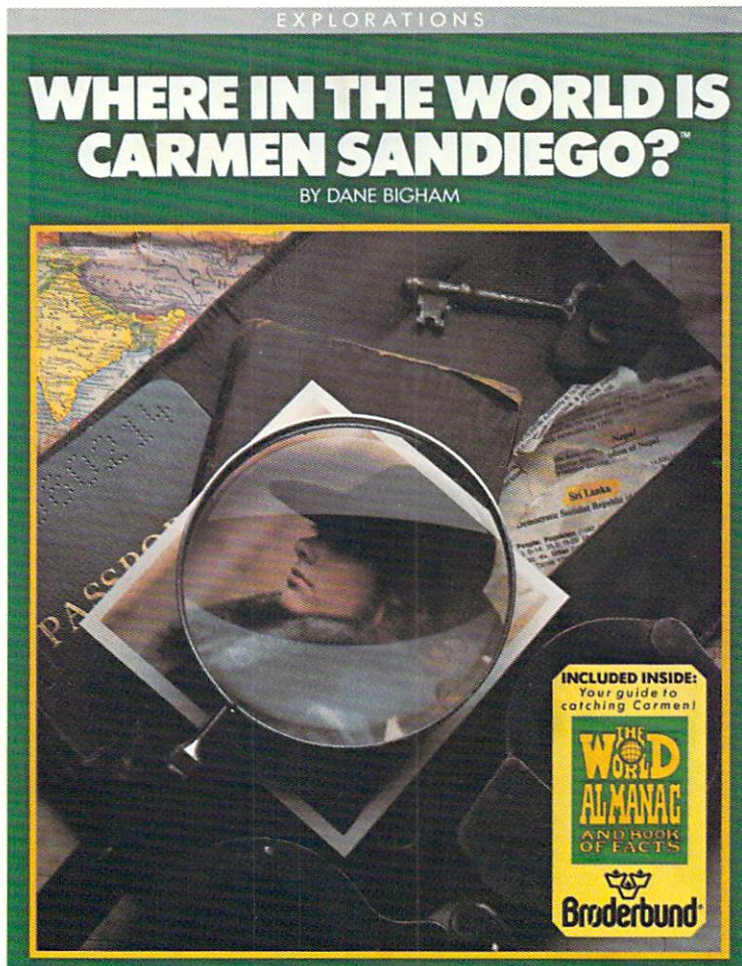
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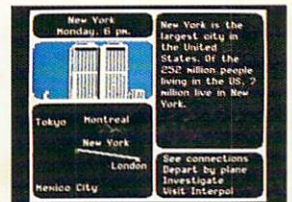


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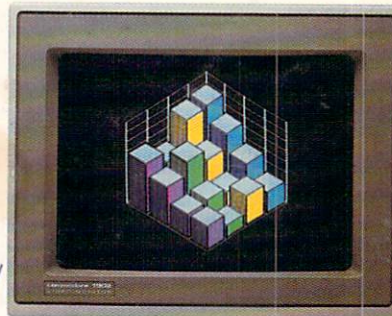
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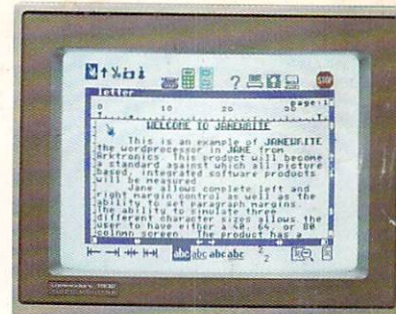
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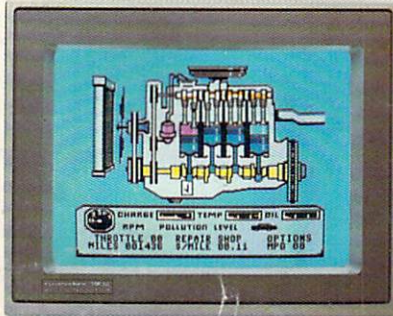
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