

Buyer's Guide to  
Computer Systems

# FAMILY COMPUTING

A Preview:  
**Tandy 1000**

THE BEST-EVER

## SHOPPING GUIDE FOR COMPUTER LOVERS

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

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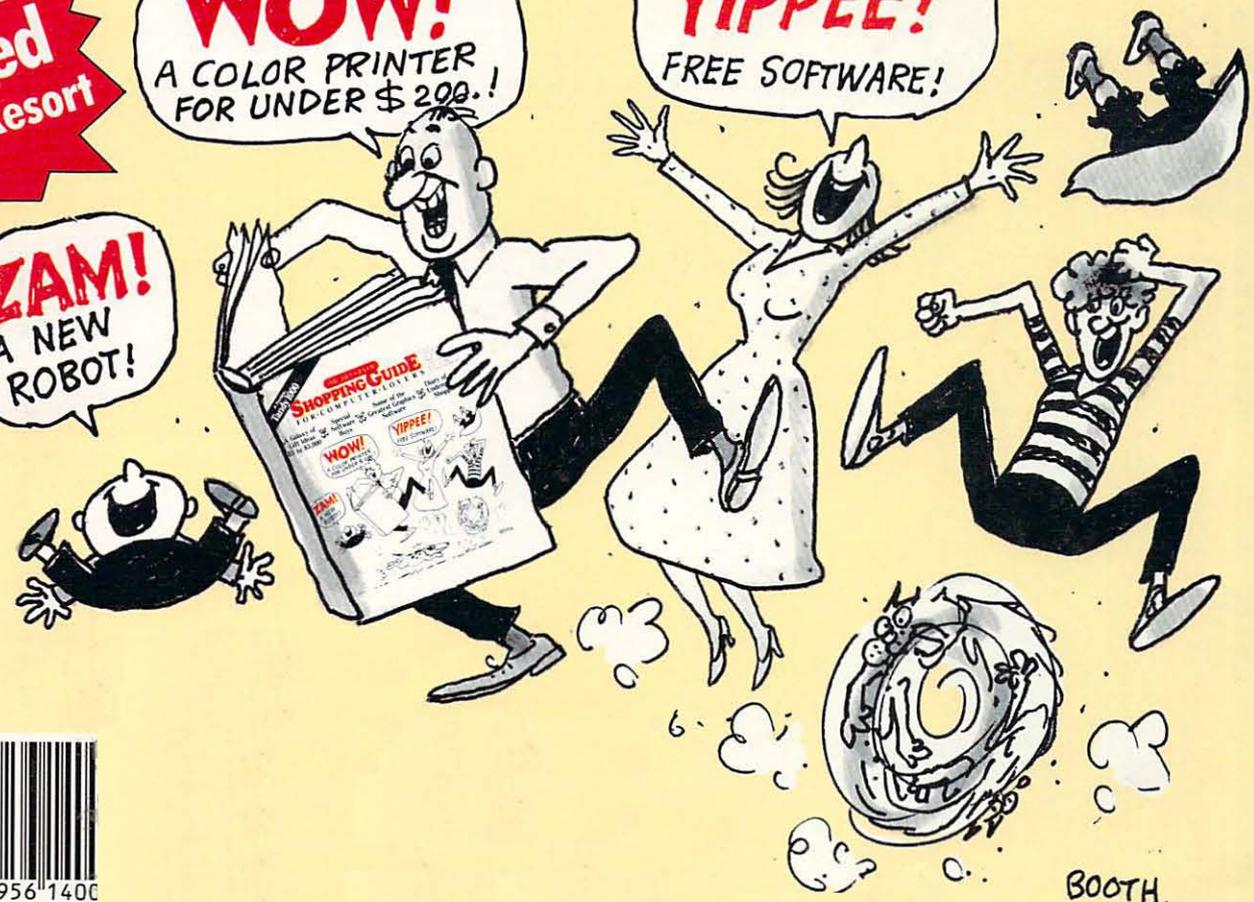
Diary of an  
Undercover  
Shopper

WIN A  
TRIP TO A  
Club Med  
Computer Resort  
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**ZAM!**  
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ROBOT!

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A COLOR PRINTER  
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**YIPPEE!**  
FREE SOFTWARE!



BOOTH.



# FAMILY COMPUTING™

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Just type in our short programs and you'll hear one of America's favorite tunes.

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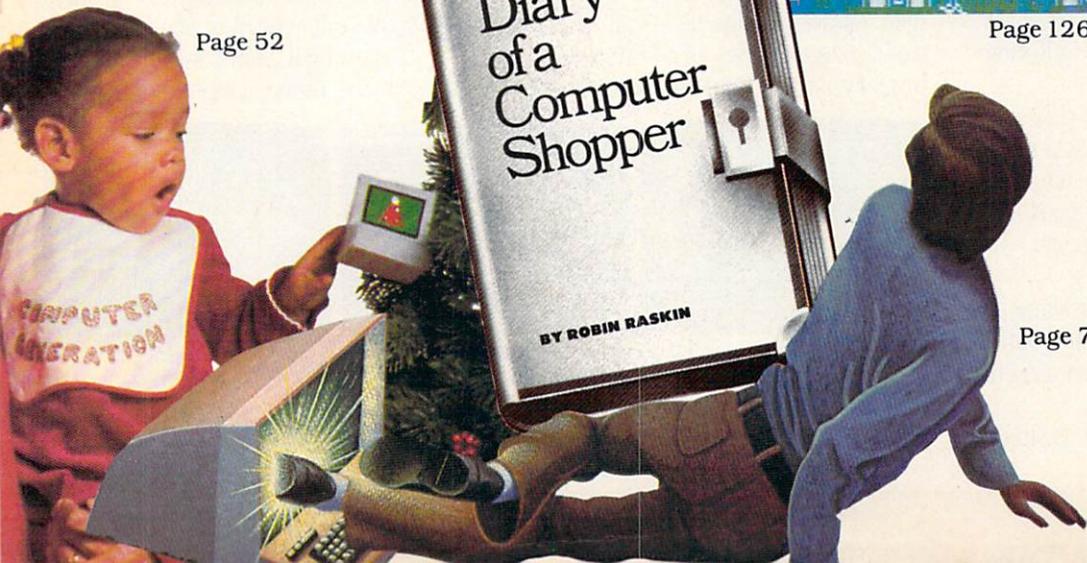
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Check out the FAMILY COMPUTING "Computing Family of the Year Contest." Your family could win an exotic getaway to a Club Med resort. See details on page 112.

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the Commodore 64 KoalaPad is *KoalaPainter*, written by Audio Light, Inc. Thank you for the opportunity to clarify a point.

PETER D. WICKMAN  
Audio Light, Inc.  
Los Gatos, California

#### IN SEARCH OF SOFTWARE

In your November 1983 issue, there was an article, "Software for Preschoolers." The software *Hodge Podge* was highly recommended. It was great, reasonably priced, and by Dynacomp. The only problem is, we still have not been able to locate this software, or the address of Dynacomp. Can you help us out? We have one Apple IIe and four preschoolers badly in need of programs designed for their age level.

MR. & MRS. HENRY A. KOCH  
Richfield, Wisconsin

EDITOR'S NOTE: You can write Dynacomp at 1064 Gravel Road, Webster, NY 14580, or call (716) 671-6160.

#### HOOKED ON ADAM

OK, so it worked! I'm a proud owner of an ADAM computer. Because you and Coleco gave me four free issues of *FAMILY COMPUTING*, I'm hooked.

After getting my issues, I'm pretty sure I'll get a subscription. You have one of the best computing magazines around. A little of everything. In your August issue, I loved the *Hangman* and *Renegade Robot* programs. Please, more programs like these and less like *Ice Cream Cone*.

How about special sections for different computers (i.e. Apple, Atari, Commodore, TRS-80, TI, and of course, ADAM)? You could have the programs in each section and explain how they work and give programming hints.

JACK REEDY  
Alto, Michigan

EDITOR'S NOTE: Thanks for the compliment and the suggestions. We're thinking about them.

#### THANKS FOR TELECOMPUTING

It was with much surprise and appreciation that I came across your

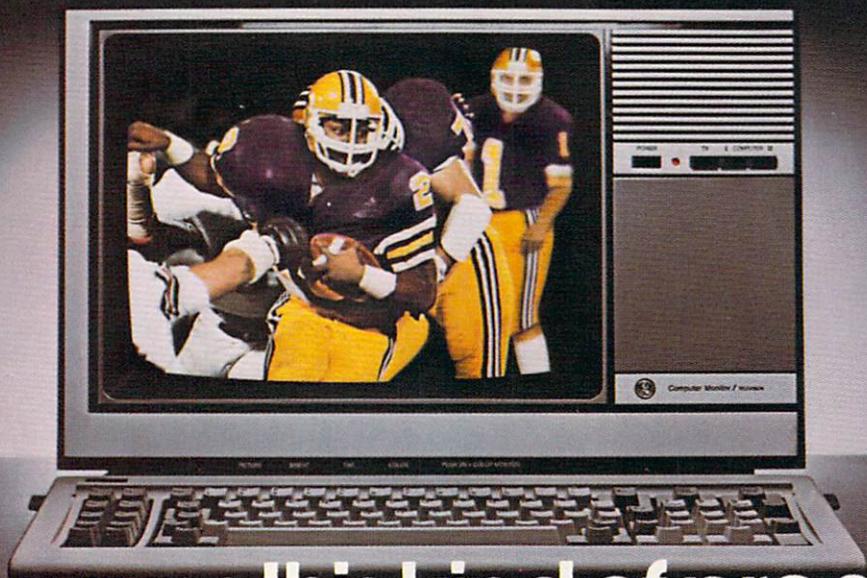
section on telecomputing in the August issue. I am a novice when it comes to modem use and had, until recently, been looking for a medium which covered this rapidly expanding field. Few magazines cover telecommunications with the detail and clarity of *FAMILY COMPUTING*.

Again, my thanks for your decision to cover this exciting facet of the home computer. If I may, I would like to call your readers' attention to one of our local boards, Wizardry, which can be reached at (713) 952-3210.

SEAN KUNEC  
Houston, Texas

#### CORRECTIONS

In the October "Buyer's Guide to Printers," we incorrectly listed information on Smith-Corona's Fasttext-80. The \$259 printer has dot-matrix output. In addition, cassette ribbons can only be purchased in a dual pack for \$18.95. In the same Buyer's Guide, the Brother HR-15 was listed incorrectly as a dot-matrix printer; it is a daisywheel.



# it even runs this kind of program.

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# GAMES

## STALKING THE PERFECT HOLIDAY GIFT

BY JAMES DELSON

If you're looking to fill a stocking, give a gift, or make the holiday season more enjoyable, here's a list of outstanding games to suit a variety of tastes.

Remember, don't judge a game by its splashy packaging or provocative title. Try to determine the game-player's preferences. Or buy according to personality, using the guide provided below.

Titles appear with manufacturers and hardware availability.

### ARCADE GAMES

Arcade games require little or no learning time. And they are easily enjoyed in 15- or 30-minute play sessions.

Ideal for:

- Large groups of game-players.
- People who put in long hours at the computer for serious applications and who want a quick action breather from intense concentration.
- Kids and adults who grow impatient with demanding puzzle-solving exercises. I'd recommend:

*Boulder Dash* from First Star/MicroFun,

for Apple, Atari, Commodore 64, IBM PC

*Buck Rogers* from Coleco, for ADAM

*Donkey Kong* from Atarisoft, for ADAM

(available from Coleco), Apple, Atari,

Commodore 64, TI

*Jumpman* from Epyx, for Apple, Atari,

Commodore 64, IBM PC

*Tutankham* from Parker Brothers, for ADAM, Atari, VIC-20

*Parsec* from TI/Triton Products, for TI

### STRATEGY/ARCADE GAMES

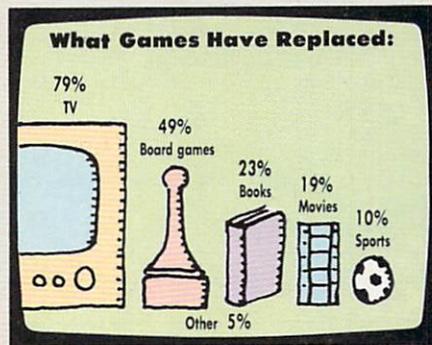
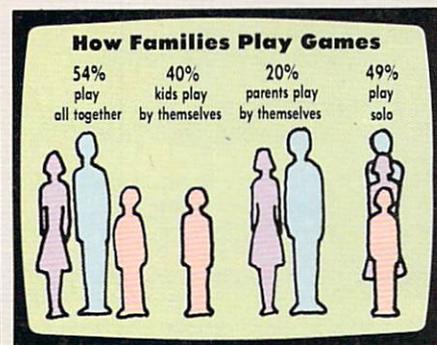
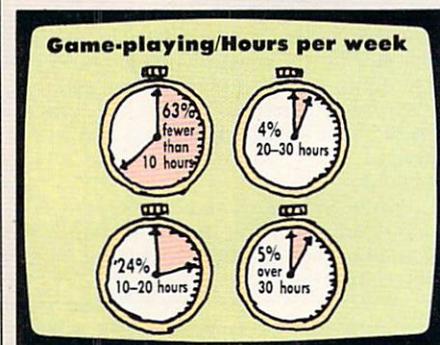
Although they challenge your hand/eye coordination, success in these contests often demands that you plan out moves in advance, deduce the opponent's strengths and weaknesses, and learn from a careful analysis of your mistakes. Ideal for:

- Game-players willing to spend more time at the computer, perfecting their skills.

I'd recommend:

*Archon II: ADEPT* from Electronic Arts,

## YOUR GAME-PLAYING AND BUYING HABITS



FAMILY COMPUTING's first Games Survey elicited a tremendous response. It's helped answer a number of questions we had concerning our readers' game-playing habits. Here are some of the most interesting facts and figures we obtained.

According to the respondents, Commodore 64 was the most popular computer brand used for game-playing, followed by TI/99-4A, Apple, and Atari.

People seem to play in moderation. Sixty-three percent of the responding families play fewer than 10 hours a week (see chart) with 24 percent playing 10-20 hours weekly, and only 5 percent playing over 30 hours a week.

Not many families impose restrictions on the amount of game-playing in the house—only 18 percent of the respondents. Thirty-three percent have some sort of rules regarding game-playing, however. Chores and homework must be completed before embarking on gaming sessions in many a home.

As you'd expect, TV-viewing has suffered most at the hands of computer game-playing. Seventy-nine percent spend less time watching the tube (see chart). Forty-nine percent play fewer board games, 23 percent read fewer books, 19 percent spend less time at the movies, and 10 percent participate less in sports. But that's not all. Some reported less eating, sleeping, sewing, and even taking care of fish since members started playing computer games.

### GAMES—A FAMILY AFFAIR

Every member of the family played games in 63 percent of the responses. For the most part (54 percent), families play together, although solo-play is important, too (see chart).

As for how and what you buy, the average respondent owned 16 computer games and bought one the month prior to filling out the survey. The price paid is, for the most part, \$25-\$35, although almost a quarter of the respondents spend more than \$35. And deciding on what to buy usually involves both parents and kids. Nine percent said that kids weren't involved at all; only 3 percent said parents weren't involved at all. Buying, of course, is a different matter: 64 percent said parents paid for the games, while kids foot the bill in 18 percent of the households that responded.

When asked to name their favorite computer game, readers gave *Parsec* (TI/Triton Products), *Wizardry* (Sir-tech), *Donkey Kong* (Atarisoft), *Lode Runner* (Broderbund), *Archon* (Electronic Arts), *Flight Simulator* (subLogic), and *Beach-Head* (Access Software) the most votes.

As for designers, only 10 percent of the respondents listed a favorite. Scott Adams (*Adventure*), Bill Budge (*Pinball Construction Set*), Marc Blank (*Zork*), and David Crane (*Pitfall*) rated highest.

Favorite game-making companies proved easier to identify. Forty-seven percent voted in that category. Infocom,

Atari/Atarisoft, Epyx, Texas Instruments, Electronic Arts, Broderbund, Strategic Simulations, Commodore, Sierra Inc., Activision, Radio Shack, and Coleco garnered the most votes, in that order.

Arcade games led the field as the most popular form of computer entertainment, with 91 percent of the respondents reporting at least one family member hooked on them. Strategy/arcade games are a popular genre as well, with 65 percent saying at least one family member liked games, such as Electronic Arts' *Archon*. Role-playing adventures like the *Ultima* series, and text/graphics adventures like Infocom's *Zork* series or Sierra's classics are equally popular.

Readers suggested a variety of ways we might improve our games coverage. A large number of respondents requested more reviews of games involving strategy and tactics. They split when it came to requesting either more or less arcade game coverage. Of course, an enormous number of readers, particularly TI owners, asked for more reviews of games for their machine. I've encountered few noteworthy new games for this computer—the reason for the scarcity of TI reviews.

Thanks one and all for your responses. We've selected and notified the winners of the Games Giveaway. We wish them and all readers happy gaming in the coming year. Stay with us as we bring you more of the most exciting entertainment programs for your computer.

# GAMES

for Atari, Commodore 64  
*Beach Head* from Access, for Atari, Commodore 64  
*Beyond Castle Wolfenstein* from Muse, for Apple, Commodore 64  
*Castle Wolfenstein* from Muse, for Apple, Atari, Commodore 64, IBM PC  
*Combat Leader* from Strategic Simulations, for Atari, Commodore 64  
*Mig Alley Ace* from MicroProse, for Atari, Commodore 64  
*Operation Whirlwind* from Broderbund, for Atari, Commodore 64  
*Raid on Bungeling Bay* from Broderbund, for Atari, Commodore 64  
*Skyfox* from Electronic Arts, for Apple  
*Star Raiders* from Atari, for Atari  
*Submarine Commander* from Thorn EMI, for Atari, Commodore 64

## STRATEGY AND TACTICS

Learn firsthand how battles were waged and won or lost with this genre which simulates all manner of warfare. These difficult games require advanced planning, coordination of a number of different details, and may take several hours or days to complete.

Ideal for:

- World history buffs.
- Players who like long and serious competition.
- Solo or group play.

I'd recommend:

*Battle for Normandy* from Strategic Sim-

ulations, for Apple, Atari, Commodore 64, IBM PC  
*Fortress of the Witch King* from Avalon Hill, for Apple, Commodore 64  
*Gulf Strike* from Strategic Simulations, for Atari  
*Legionnaire* from Avalon Hill, for Apple, Atari, Commodore 64  
*Lordlings of Yore* from Softlore, for Apple  
*Parthian Kings* from Avalon Hill, for Apple, Commodore 64  
*Tigers in the Snow* from Strategic Simulations, for Apple, Atari, Commodore 64, IBM PC/PCjr

## TEXT AND TEXT/GRAPHIC ADVENTURES

These games make you the hero of a novel—as the plot unfolds you encounter more obstacles to the completion of your quest. First-rate problem-solving skills are a prerequisite here, though it's often fun for the whole family to get involved. Ideal for:

- Puzzle and braintwister fans.
- People who like to use their wits.

I'd recommend:

*Enchanter* (all text) from Infocom, for Apple, Atari, Commodore 64, IBM PC/PCjr, TI, TRS-80

*The Mask of the Sun* from Broderbund, for Apple, Atari, Commodore 64

*Pirate Adventure* (graphics) from TI/Triton, for TI

*Suspended* (all text) from Infocom, for

Apple, Atari, Commodore 64, IBM PC/PCjr, TI, TRS-80  
*Ulysses and the Golden Fleece* from Sierra Inc., for Apple, Atari, Commodore 64, IBM PC/PCjr

## ARCADE/ROLE-PLAYING ADVENTURES

These games feature moving pictures and more interaction with the computer. Ideal for:

- Arcade gamers with adventurous urges.
- Adventure gamers with arcade itches.

I'd recommend:

*Aztec* from Datamost, for Apple, Atari, Commodore 64

*King's Quest* from Sierra Inc., for IBM PC  
*Murder on the Zinderneuf* from Electronic Arts, for Apple, Atari, Commodore 64, IBM PC

## FINANCIAL

Manipulate money, develop strategies to beat the system, and/or your competitors in a race for the most—whether you're dealing in stocks and bonds, real estate, or synthetic bananas. These challenges require a lot of time, planning, and thought.

Ideal for:

- Junior financiers and executives.
- Students learning the ins and outs of economic wheeling and dealing.

I'd recommend:

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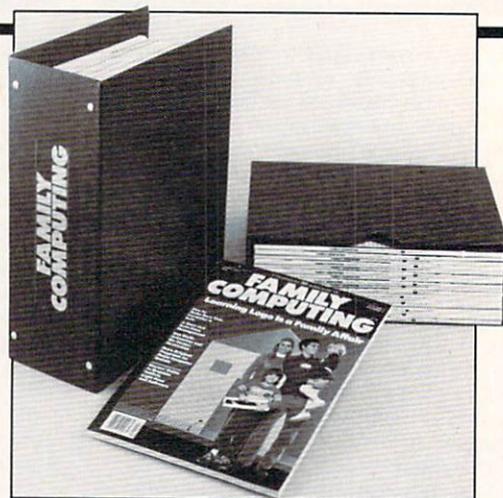
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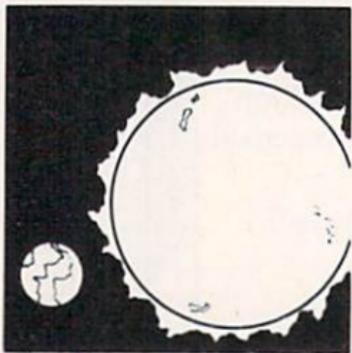
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# GAMES

*Cartels and Cutthroats* from Strategic Simulations, for Apple  
*M.U.L.E.* from Electronic Arts, for Atari, Commodore 64  
*Oil Baron* from Epyx, for Apple, Commodore 64, IBM PC  
*Rails West!* from Strategic Simulations, for Apple, Atari, Commodore 64  
*Run for the Money* from Scarborough Systems, for Apple, Atari, Commodore 64, IBM PC

## SPORTS

Ideal for:

- The sports enthusiast.
- Arcade gamers looking to challenge fellow joystick pros.
- Group or solo play.

I'd recommend:

*Julius Erving and Larry Bird Go One-on-One* from Electronic Arts, for Apple, Atari, Commodore 64, IBM PC  
*Professional Tour Golf* from Strategic Simulations, for Apple, Commodore 64, IBM PC/PCjr  
*Rocky* from Coleco Industries, for ADAM  
*Star League Baseball* from Gamestar, for Apple, Atari, Commodore 64  
*International Soccer* from Commodore, for Commodore 64

## CONSTRUCTION SETS

Ideal for:

- Tinkerers and mechanics.
- Arcade gamers who've ever thought "I

could have made it better."

- Group fun—build games to challenge family and friends.

I'd recommend:

*Lode Runner* from Broderbund, for Apple, Atari, Commodore 64  
*Mr. Robot and His Robot Factory* from Datamost, for Apple, Atari, Commodore 64  
*Rally Speedway* from Adventure International, for Atari

## ROLE-PLAYING ADVENTURES

You create characters and send them into action on a quest for treasure or fame. If dragons and dwarves, exploration and questing are the fancy of the gamer on your list, these should go over splendidly. Fun and compelling, this breed isn't to be tackled lightly. Games can last for months.

Ideal for:

- Extended group play.
- Dreamers and romantics over 10 years old.

I'd recommend:

*Galactic Gladiators* from Strategic Simulations, for Apple, IBM PC/PCjr  
*The Seven Cities of Gold* from Electronic Arts, for Apple, Atari, Commodore 64, IBM PC  
*Ultima II* from Sierra Inc., for Apple, Atari, Commodore 64, IBM PC  
*Tunnels of Doom* from TI/Triton Products, for TI

*Ultima III* from Origin Systems, for Apple, Atari, Commodore 64, IBM PC  
*Wizardry* series from Sir-tech, for Apple

## BEGINNER GAMES FOR KIDS AND CAUTIOUS ADULTS

Ideal for:

- The game player who isn't so fearless.
- People who haven't gotten their feet wet.
- Limited play sessions.
- Group, as well as solo play.

I'd recommend:

*B.C.'s Quest for Tires* from Sierra Inc., for ADAM, Atari, Commodore 64, IBM PC/PCjr  
*Bristles* from First Star, for Atari, Commodore 64  
*Gateway to Apshei* from Epyx, for ADAM, Atari, Commodore 64  
*Gumball* from Broderbund, for Apple, Atari, Commodore 64  
*Motor Mania* from United Microware, for Commodore 64  
*Rabbit Trail* from Funware/Creative Software, for TI  
*Star Wars: The Arcade Game* from Parker Brothers, for ADAM, Atari, Commodore 64  
*Triple Brain Trust* from Reston, for IBM PC/PCjr 

JAMES DELSON is FAMILY COMPUTING's games critic. Next month he will give his list of the year's best.

IF YOU OWN A HOME COMPUTER  
THERE'S ONE NAME YOU SHOULD KNOW:

**ACTIVISION**

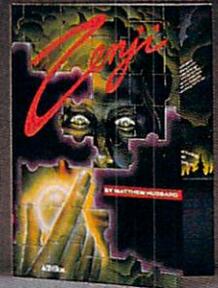
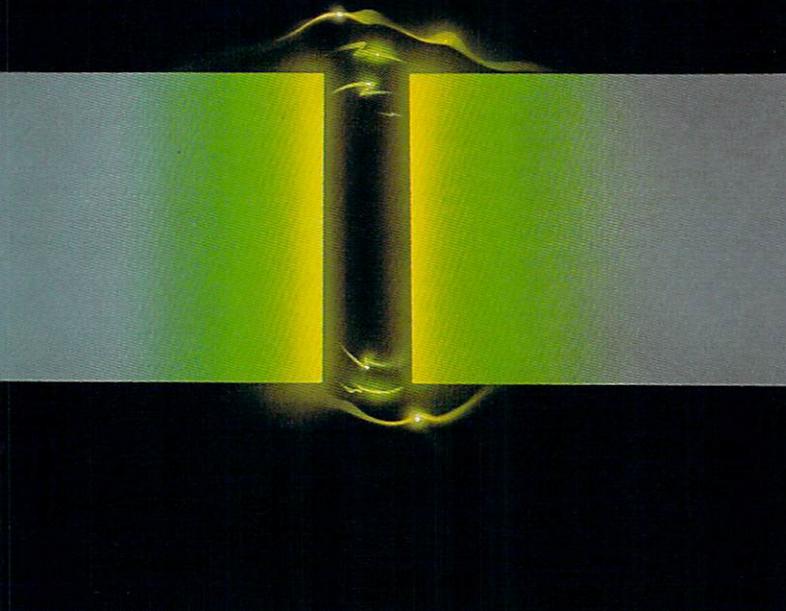
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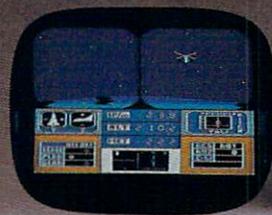


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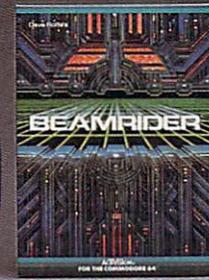


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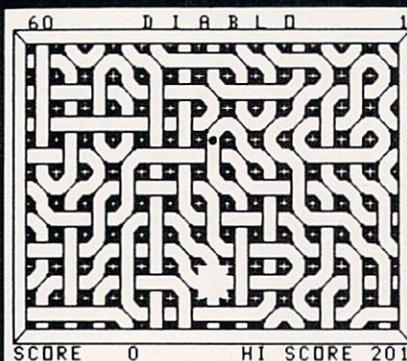
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## LEARNING LOGO

efficient way to create such a figure is to use the **REPEAT** command. Remember, **REPEAT** is used along with a number indicating how many times the commands within the brackets are to be repeated. For instance, an efficient procedure for an equilateral triangle might look like this:

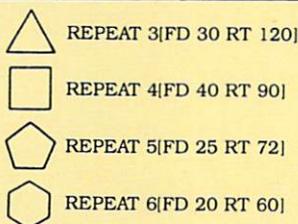
```
TO TRI  
REPEAT 3 [FD 30 RT 120]  
END
```

Next, have family members try drawing a pentagon, or five-sided figure, like the one below. And, after that, try the hexagon, or six-sided figure. Make sure to use the **REPEAT** command in each procedure that is defined.

Next, help your kids examine the common elements in the commands that have been used to define these shapes. Toss in the formula for a square (a four-sided figure) as well, and see what similarities they identify. Most kids will need help with this aspect of the discovery learning approach.

Help them to note these four things:

1. Making any regular shape requires repeating a pair of operations (e.g. draw/turn) several times.
2. The number of repeats needed to make the shape is the same as the number of sides in the shape.
3. The size turn (degrees in each angle) needed to make the shape can be determined by dividing the number of sides into 360.
4. The number of forward steps in a side can differ from figure to figure.



To help youngsters get even closer to discovering how to make a circle, have them try a 10-sided figure next, than a 36-sided figure. Suggest that they also begin to experiment with sides that are shorter, i.e. with fewer turtle steps in them. (This will help prevent the turtle from going off the screen, or wrapping around as it attempts to draw the shape.)

Keep going by attempting figures that have over 100 sides. For instance, try a 120-sided figure with sides only four turtle steps long, then a 360-sided figure with sides

that are only one turtle step long. What has been created with the last scenario? A circle!

## TIME TO TALK

Naturally, children are going to need some guidance through the discovery learning process and it does require mastery of the basic arithmetic skill of division. (If you're not comfortable with this process, you can either skip it, or better yet, learn along with your child.) Generally, children in the fourth or fifth grade are ready to handle the concepts involved in creating Logo polygons and circles, and have mastered the requisite arithmetic skill of division. Even at that, you will need to talk to them about what they think might be happening. Ask open-ended questions to help them draw conclusions about the progression from 3-sided figures to figures with 360 sides—from triangles to circles. For example, when looking at two circles, you could ask "Why do you think that circle is bigger than the one we just drew?" rather than "Which circle is bigger?"

Parents might wonder why it wouldn't be much easier just to give youngsters the formula for a circle and then show them how to change its size by altering the number of turtle steps in each side. It works. They can make circles that way, but they are missing the opportunity to think through what is happening. In short, they haven't had to put any problem-solving skills to work, thereby circumventing one of the major strengths of what Logo can teach youngsters.

That's not to say that very young children should not use circles in Logo designs. Even preschoolers can put circles to work in their pictures if parents or older brothers or sisters define a set of circles for them to use. However, once they are old enough to understand the conceptual basis for the commands Logo uses to make circles, it would be helpful for parents to back track and help them examine the meaning of those commands.

In the "Family Challenge" this month we provide a Logo program that outlines a Christmas tree. Logo learners are encouraged to write procedures that add colorful ornaments to the tree and packages underneath it. Next month we will take a look at using variables in Logo procedures, making it easier to create shapes of differing sizes. ☐

# BUYER'S GUIDE TO COMPUTER SYSTEMS

## HOW TO BUILD A SYSTEM IN THREE STAGES

This Buyer's Guide is the work of several people. Charles Gajeway, a contributing editor to FAMILY COMPUTING, and long-time Apple and IBM expert, wrote the introduction and compiled Apple and IBM systems.

Louis Wallace, who has written several Buyer's Guides and product reviews for FAMILY COMPUTING, and who is a former president of the Gainesville, Florida, Commodore Users' Group, was charged with listing Commodore and Atari components.

Lance Paavola, FAMILY COMPUTING's technical director and author of the "Tandy 1000 Preview" in this issue, took on the challenge of tracking down the best equipment for the TRS-80 Color Computer. He was aided by comments from Sandy Trevor and Richard Gregory, CoCo fans found on CompuServe.

In some ways, choosing a computer system is like shopping for a stereo. Some manufacturers offer prepackaged systems that include all the major operating parts. Others sell the keyboard and CPU alone, and leave the task of assembling a working system—with a cassette or disk drive, a TV or monitor, a printer—to you.

Of all the major computers designed specifically for home use, only Coleco's ADAM is a complete system; all the rest require at least some decisions on the part of the buyer as to what auxiliary equipment he or she requires. Apple and IBM computers are often sold as systems, but can be expanded far beyond the "starter" stage to meet growing needs.

Among business-oriented computers, many of which are now being used in the home, the Compaq, Epson QX-10, Kaypro 2X and 4, Apple Macintosh, Sanyo MBC 550, TRS-80 Model 4, and the Panasonic Sr. Partner (see chart) are often sold as complete systems.

Whether you're buying a computer primarily for business, education, or entertainment use, we feel the basic hardware needs are very similar, as are the basic patterns of growth and expansion. Obviously, if you're a musician or an artist, you'll expand somewhat differently than an accountant, parent, or a writer. But the basic path will be the same.

What makes a piece of hardware

good is that elusive balance between usefulness, reliability, and price—i.e. the value factor. Adaptability and expandability are also key product attributes. It is downright wasteful to have to discard a piece of a system when upgrading it or expanding its capabilities. Choosing versatile equipment at the start is a key factor to the long-term enjoyment and usefulness of a home system.

Described below are three general types of systems—called "Entry," "Working," and "Dream." Whatever your primary application, the progression from one system to the next should follow the same logical pattern shown here.

### ENTRY SYSTEM

An Entry system includes enough to get started. That means a keyboard and system unit (CPU), a display device (TV or monitor), a storage unit (cassette recorder or disk drive), and usually game controls (joysticks or trak balls). If you can afford it, a printer should also be included.

While purchase of the printer can be deferred for a while, not being able to produce hard-copy output seriously reduces the usefulness of any computer. If you're going to use your computer for business, start out with a low-cost letter-quality printer (\$350-\$500). You can add a more versatile dot-matrix printer later. If speed or the ability to print out graphics displays is a must, then you'll need a dot-matrix printer.

In general, low-cost letter-quality (daisywheel) printers are a better val-

ue than low-cost dot-matrix printers (\$150-\$250).

### WORKING SYSTEM

The intermediate Working system expands the user's horizons with additional storage (either the first or second disk drive), a modem, and extra memory (if available). And, for those who couldn't afford it at first, a printer. This type of system will satisfy most users' needs.

Some of the items we've included in the Dream category—like a graphics tablet or a voice synthesizer—could be substituted to customize a system for a particular family's needs.

### DREAM SYSTEM

The Dream system is the practical maximum—everything that will fit and offer the user a reasonable degree of functionality, particularly for business or professional use. Such a system includes items such as a high-resolution RGB (Red-Green-Blue) color monitor (where possible); a large capacity hard disk for fast, convenient data storage; a wide-carriage dot-matrix printer that will produce text and graphics on most sizes of paper; maximum RAM; a plotter to produce quality color graphics; a graphics tablet for computer drawing; and other niceties. This system offers the ultimate in convenience, speed, and flexibility.

### APPLE AND IBM

In general, Apple and IBM computers are more powerful and easily expanded than lower-priced systems. For that reason, my equipment choices for these two systems are more advanced and specialized.

For the most part, using a color TV with Apple or IBM systems is unacceptable, since an 80-column display



**1. ENTRY SYSTEM.** Besides the keyboard and CPU (sometimes one unit), the Entry system should include either a TV or a monitor, and either a cassette recorder or a disk drive. A printer is recommended, but optional.

# 15 COMPUTERS FOR

Computer	Price	RAM: Minimum/ Maximum	Bundled Software	Bundled Hardware	Monitor, TV, or Both	Interfaces/Cartridge
ADAM	\$750	80K	SmartBasic, SmartWriter, Buck Rogers Planet of Zoom	Digital data drive, printer, two joysticks	Both	Nonstandard parallel; cartridge
Apple IIc	\$1,195	128K	BASIC, ProDOS, tutorials	Disk drive	Both	2 RS-232C serial ports
Apple IIe	\$995	64K/128K	BASIC, ProDOS	Monitor, disk drive	Both	Optional; 7 expansion slots
Atari 800XL	\$199	64K	BASIC	None	Both	Nonstandard serial; cartridge
Commodore 64	\$199	64K	BASIC	None	Both	Nonstandard serial; cartridge
Commodore Plus/4	\$299	64K	Word processor, data base, spreadsheet, graphics, BASIC	None	Both	RS-232C; cartridge; nonstandard parallel user port
Compaq Portable	\$2,495	128K/640K	DOS 1.0, BASIC	Disk drive, monitor	Both	Centronics parallel
Epson QX-10	\$2,495	256K	Valdocs (with word processing)	2 disk drives, monitor, RX-80 printer	Monitor	Centronics parallel and RS-232C; 5 option slots
IBM PC	\$1,999	256K/640K	PC-DOS 2.0, BASIC	Disk drive	Both	Optional; 5 expansion slots
IBM PCjr	\$999	128K/512K	PC-DOS 2.1, BASIC	Disk drive	Both	RS-232C serial; parallel is optional; cartridge
Kaypro 2X	\$1,599	64K	BASIC, Star series, CPM	2 disk drives, monitor	Monitor	Parallel, 2 RS-232C serial
Macintosh	\$2,195	128K/512K	MacWrite, MacPaint	Disk drive, monitor, mouse	Monitor	2 serial, mouse, speaker, and disk drive ports
Panasonic Sr. Partner	\$2,145	256K/512K	MS-DOS 2.11; VistCalc; pfs: report, file, and graph, WordStar	Disk drive, thermal printer	Monitor	Parallel and serial
Sanyo 550-2	\$999	128K/256K	MS-DOS 2.11, WordStar, CalcStar, EasyWriter I, BASIC	Disk drive	Monitor	Centronics parallel; RS-232C serial opt.
Extended TRS-80 Color Computer 2	\$159	16K/64K	Extended Color BASIC	None	TV	RS-232C serial; cartridge
TRS-80 Model 4	\$1,099	64K/128K	BASIC, TRSDOS 6.0	Disk drive, monitor	Monitor	Centronics parallel; RS-232C serial optional

FOOTNOTES: 1 Plus/4 and Epson QX-10 allow horizontal scrolling. 2 Atari 800XL and Commodore Plus/4 have 16 colors, with 16 and 8 luminances, respectively.

(best for word processing) is beyond the resolution of any TV. The only practical solution is to use a monochrome display for 80-column work, and a TV when color is needed (for games and educational programs). Or, you can put up the extra money for an RGB monitor—which does both well—right at the start. I've included an RGB in the Dream system.

Since Apples and IBMs are often used for business applications, and are frequently sold with a disk drive, tape recorders are not an option.

## APPLE IIe

### Entry System

COMPUTER: Apple IIe 64K "Starter System" (\$995)

#### Includes:

STORAGE: Apple Disk II with controller card (Apple DuoDisk dual drive is extra)

#### Not Included:

DISPLAY: Apple Monitor II (\$229)  
 PRINTER: Silver-Reed EXP 400 (\$399), or Epson RX-80 (\$399), or Okidata Microline 82A (\$499), or Star Micronics Gemini 10 (\$399)  
 INTERFACE: Orange Micro Grappler+ parallel printer interface (\$145)

The Apple IIe Starter System is a superb way to enter computing. The Silver-Reed is a good (but slow) performer that uses standard daisy wheels and ribbons. The Orange Micro Grappler+ printer interface only

makes sense if you're adding a parallel dot-matrix printer, such as an Epson. If you are, this interface allows you to print out all Apple graphics with virtually any major brand.

### Working System

#### Add to the above:

STORAGE: Apple Disk II (\$429), unless DuoDisk purchased with Starter system

MODEM: Hayes Micromodem IIe (\$329); or Apple Super Serial card (\$125) and Hayes Smartmodem 1200 (\$699)

INTERFACE: Taxan 410-64K memory add-on 80-column card (\$250)

OTHER: Kensington Microware System Saver fan (\$89)

Resist the temptation to buy a non-Apple disk drive, even though many third-party drives store much more data. Apple drives are extremely reliable and well serviced. The Kensington fan cools the system, and also provides outlets for a printer and monitor, as well as a front-mounted power switch. The Taxan interface card is preferable to others (all expand memory to 128K and give 80-column displays) because the Taxan allows for RGB output. The Hayes Micromodem IIe (300 baud) is an internal modem (which means that you won't need a serial card), but the Hayes 1200-baud Smartmodem is four times faster and can save money. Hayes modems are industry stan-

dards, and will work well with virtually any communications program.

### Dream System

#### Add to the above:

STORAGE: Great Lakes Superior 10 megabyte hard disk drive (\$1,495)

PRINTERS: Okidata Microline 84 dot-matrix printer (\$1,099), or Star Micronics Gemini 15X (\$549), and/or Hewlett-Packard 7470 plotter (\$1,095)

DISPLAY: Taxan 415 High Resolution RGB monitor (\$540)

INPUT DEVICES: KoalaPad touch tablet (\$125), Apple Mouse (\$99)

I use the Great Lakes hard disk drive on my IBM PC, and find it a reliable mass storage unit at a most attractive price. The Okidata 84 is the best all-around printer on the market today, in my opinion. The Taxan monitor is the finest Apple display I have seen to date.

## APPLE IIc

### Entry System

COMPUTER: Apple IIc (\$1,195)

DISPLAYS: Apple Monitor IIc with stand (\$239); or TV

PRINTER: Apple Scribe printer (\$299) or ImageWriter (\$595)

Unlike the IIe, which is an extremely flexible system, the IIc is fairly straightforward. The disk drive is built in. Apple's own components

# HOME USE

Disk Drive Storage	No. of Keys	Function Keys	Text Display	No. of Colors	Sprites	Voices/Octaves	Maximum Resolution
256K	75	6 Smart Keys	36 × 24	16	32	3/5	256 × 192
143K	63	2	80 × 24	16	None	1 <sup>3</sup>	560 × 192
140K	63	2	40 × 24	16	None	1 <sup>3</sup>	280 × 192
180K	65	4	40 × 24	256 <sup>2</sup>	4	4/3.5	320 × 192
170K	66	8	40 × 25	16	8	3/9	320 × 200
170K	67	8	40 × 24 <sup>1</sup>	121 <sup>2</sup>	None	2/4	320 × 200
320K	83	10	80 × 25	16	None	1 <sup>3</sup>	720 × 300
376K	105	18	80 × 24 <sup>1</sup>	2	None	1 <sup>3</sup>	640 × 400
360K	83	10	80 × 25	16	None	1 <sup>3</sup>	640 × 200
360K	62	10	80 × 25	16	None	3/7	640 × 200
195K	72	18	80 × 25	2	None	None	100 × 160
400K	58	1	varies	2	None	4/12	512 × 342
360K	83	10	80 × 25	16	None	None	640 × 200
360K	84	5	80 × 25	8	None	1 <sup>3</sup>	240 × 200
156K	53	None	32 × 16 <sup>1</sup>	8	None	1 <sup>3</sup>	256 × 192
184K	70	3	80 × 24	2	None	1 <sup>3</sup>	256 × 192

1 One-voice computers can be programmed to output varying numbers of tones. 2 No lowercase characters.

match its design and work well. The Scribe is a reasonably priced color printer; if you don't want color output, then a low-cost letter quality or a medium-priced dot-matrix—such as the ImageWriter—would be better. But you have fewer choices here than on the Ile, since the Ile has a serial printer interface.

### Working System

Add to the above:

STORAGE: Disk IIc (\$329)

MODEMS: Apple Modem 300 (\$225) or 1200 (\$495)

INPUT DEVICE: Apple Mouse (\$99)

If you can afford it, go with a 1200-baud modem. Since the serial interface is included (it's not on the Ile), you can put that saved money into a more powerful modem.

### Dream System

Add to the above:

DISPLAY: Apple Color 100 monitor (\$599)

INPUT DEVICE: KoalaPad touch tablet (\$125)

PRINTER: NEC 3500 Spinwriter serial printer (\$1,795), or Riteman L.Q. (\$299)

The NEC is a very versatile printer, if you need letter-quality text and/or wide (203-character) printouts. The Riteman L.Q. is a light letter-quality printer for people on the move.

## IBM PC

### Entry System

COMPUTER: IBM PC, 256K, one 360K disk drive (\$1,795)

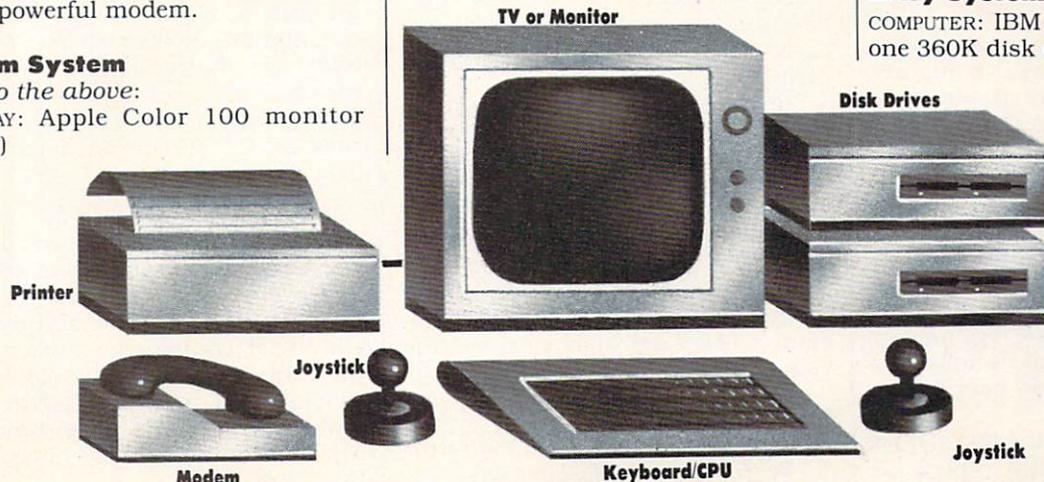
DISPLAY: NEC JB-1270MA monochrome monitor (\$249)

PRINTER: Silver-Reed EXP-400 daisy-wheel printer (\$299)

## IBM PCjr

### Entry System

COMPUTER: IBM extended PCjr, 128K, one 360K disk drive (\$999)



**2. WORKING SYSTEM.** If you didn't have a printer in the Entry System, add one now. Switch from cassette to disk drive. If you initially bought a disk drive, you might add another. Add a modem for telecommunications.

DISPLAYS: NEC JB-1270MA monochrome monitor (\$249); or TV  
PRINTER: Silver-Reed EXP 400 daisy-wheel printer (\$399)

It doesn't make sense to buy a color monitor for the PCjr. Use a color TV until you can afford an RGB monitor, which makes the PCjr look great.

**Working System**

*Add to the above:*

MODEM: IBM PCjr internal 300-baud modem (\$199)  
MEMORY EXPANSION: Tecmar jrCaptain multifunction expansion 128K (\$395)

While you can use IBM's memory expansion units (they attach to the side of the unit), the Tecmar jrCaptain mates perfectly with the system unit, and provides expanded memory (to 256K), a clock, and a printer connection (parallel).

Since the IBM modem is internal, the serial port is left free for a printer.

**Dream System**

*Add to the above:*

DISPLAY: IBM PCjr Color Display (\$429)  
PRINTERS: Okidata 84 dot-matrix printer (\$1,099), or Star Micronics Gemini 15X (\$549)  
MODEM: Hayes Smartmodem 1200 (\$699)  
MEMORY EXPANSION: Tecmar jrCadet memory expansion, 64K to 384K (\$195-\$595)

The IBM PCjr Color Display, a superb RGB monitor, performs nearly as well as the pricier IBM PC Color Display. And, it's the only monitor we know of that can sit atop the PCjr. Others interfere with the operation of the unit. If you decide to use the Hayes Smartmodem 1200, you'll connect it to the serial port, meaning you'll have to use a parallel printer.

—CHARLES GAJEWAY

**ATARI 800XL**

The first thing to know about the 800XL—long revered as a computer with great sound and graphics—is that its future is uncertain. Atari's new owner and President, ex-Commodore chief Jack Tramiel, has indicated that the 800XL will probably not be available much beyond Christmas. But, since the 800 line has been around for several years, there's plenty of software and peripherals to support it. Plan on getting equipment fairly quickly, while dealers still carry it. The prices should be heavily discounted.

In addition, because the 800XL has a 40-column display only, there's no

point in getting a monochrome monitor. A TV or color monitor will suffice for all Atari software. Finally, the Atari has a nonstandard interface; to connect most printers and modems, except some made expressly for Atari, you'll need a special interface.

**Entry System**

COMPUTER: Atari 800XL (\$199)  
STORAGE: Cassette: Atari Program Recorder (\$50); or Disk Drives: Atari 1050 (\$299), or Indus GT (\$485), or Rana 1000 (\$449), or Trak AT-D2 (\$499)  
DISPLAYS: Amdek Color 300 (\$349) or Commodore 1702 (\$300) monitors; or color TV

The Atari 1050 is not the world's greatest disk drive, but it works, and the price may be right. The Trak drive has a parallel-printer port built into the back, which is a major advantage, and it stores considerably more than the Atari 1050.

Both the Commodore 1702 and Amdek color monitors are very good composite color monitors, and will give better performance than a TV. If you're going to start out with a cassette recorder, you must use the Atari Program Recorder.

**Working System**

*Add to the above:*

STORAGE: Disk drive (add to cassette system)  
PRINTERS: Inforunner Riteman Plus (\$399), or Star Micronics Gemini 10X (\$399), or Okimate 10 (\$169)  
MODEM: Microbits Peripheral 1000c (\$149), or Anchor Automation's Volksmodem (\$79)  
INTERFACES: Atari 850 Interface (\$50) or Digital Devices' Ape Face (\$79)

If you started your system with a cassette recorder, you should add a disk drive now. Otherwise, adding a printer should be your top priority. The Gemini 10X printer is a good quality dot-matrix printer. The Atari 850 interface, or Digital Devices Ape Face, will be needed to connect some peripherals.

The Axiom printer comes with a direct-connect cable for the Atari. The Okimate 10 is a remarkable color-graphics printer that also prints text, and is sold with an interface/cable (\$69) for the Atari (or Commodore). The Microbits Peripheral modem plugs into the joystick port and comes with a communications program. There's an Atari cable for the Volksmodem.

**Dream System**

PRINTERS: Silver-Reed EXP-400 (\$399), or Smith-Corona Fastext-80

(\$259), or AlphaPro (\$399)  
MODEM: Anchor Automation Mark XII 300/1200-baud modem (\$399)  
INPUT DEVICE: Atari Touch Tablet (\$110)

If you want to add a letter-quality printer to your arsenal, consider the Silver-Reed 400, or Alphacom's AlphaPro. Smith-Corona's Fastext-80 is a reasonably priced dot-matrix.

The Atari Touch Tablet is a superb drawing tool. Since the Atari has 256 possible colors, you can create some fascinating graphics with it. The Anchor Mark XII is Hayes-compatible.

**COMMODORE 64**

The Commodore 64 is known for its great sound and large software base. When thinking in terms of a system, however, it has one limitation: nonstandard interfaces. Thus, when you are connecting peripherals not made by Commodore, you'll need a special interface. On the other hand, a feature that makes adding peripherals easy is the "expansion slot" in the back of the C 64.

Be sure to keep compatibility in mind. For instance, if you plan on getting an 80-column cartridge and an IEEE interface for faster disk drive access, you can't count on all of them to work together. And not all printer interfaces will allow you to print out all the Commodore graphics.

**Entry Level**

COMPUTER: Commodore 64 (\$199)  
STORAGE: Cassette: 1530 Datassette Recorder (\$70); or Disk Drive: 1541 Disk Drive (\$260)  
DISPLAYS: Commodore 1702 (\$300) monitor; or TV

**Working System**

STORAGE: MSD Systems dual disk drive (\$699)  
PRINTERS: Axiom GP 550 CD (\$319), or Mannesman-Tally Spirit 80 (\$399), or Okimate 10 (\$169)  
MODEMS: C1600 (\$49) or Anchor Automation's Volksmodem (\$79)  
INTERFACE: Batteries Included Buscard II (\$199) and Cardco Card?/+G printer interface (\$89)  
INPUT DEVICE: KoalaPad touch tablet (\$110)

If you didn't buy a disk drive at first, the MSD dual drive is a possibility. It's the most compatible and reliable of third-party drives for the C 64. However, it's expensive, and requires additional equipment since it uses the IEEE interface. It should only be considered if you're using the computer to help run a small business. The Buscard II is the choice IEEE interface.

The Mannesman-Tally Spirit 80 dot-matrix printer has a good "near letter-quality" text, and can also handle graphics for charts and pictures. Since it's an Epson-compatible printer, many software packages work with it. The Cardco interface (an interface is needed for any non-Commodore printer) allows all the Commodore characters to be printed. The C1600 VICModem (300 baud) is a very good, inexpensive modem that plugs right into the C 64. Anchor Automation's Volksmodem is somewhat more sophisticated—and equally easy to use.

**Dream System**

Add to the above:

- DISPLAY: Monochrome Monitor
- PRINTER: Silver-Reed EXP-400 (\$399)
- MODEM: Hayes Smartmodem 1200 (\$699) and VIC 1011A RS-232C interface (\$50)
- INTERFACE: Batteries Included 80-column adapter (\$199)
- OTHER: Tech-Sketch LP-10 light pen (\$39; \$119 w/software) and/or Currah's The Voice Messenger

For the dream system, an 80-column card from Batteries Included has been added, since it will work with the Buscard II IEEE interface. (Note: Many Commodore word-processing programs will not take advantage of 80-column displays; Batteries Included PaperClip does.) If you do add the 80-column display, you'll need a monochrome monitor for a clear display. Currah's Voice Messenger is a superb speech synthesizer, and is relatively easy to program.

—LOUIS WALLACE

per-line and 16 lines) is not the CoCo's strong suit. Without a third-party hardware add-on, lowercase letters appear as inverse capitals. Despite these limitations, the CoCo can be revved up to be a powerful system.

**Entry System**

- COMPUTER: 16K Extended TRS-80 Color Computer (\$159)
- DISPLAY: Color TV
- STORAGE: CCR-81 Cassette (\$59)

We chose the CCR-81 over the new CCR-82 because it does not require an AC adapter; unless you plan to travel with your CoCo, you'll want the security of knowing that low batteries aren't interfering with clear recording. (You can also use your own cassette tape recorder.) The Extended model is highly recommended over the Standard Color Computer (\$119). It's much easier to program and allows you to connect a disk drive without an upgrade.

**Working System**

- MEMORY EXPANSION: 16K version to 64K (\$69)
- STORAGE: Color Disk #1 Kit (\$349)
- PRINTERS: DMP-105 Dot-Matrix Printer (\$199) or CGP-115 Compact Color Graphics Printer (\$199)
- MODEMS: Deluxe RS-232 Program Pak (\$79) and Direct-Connect Modem I (\$99) or Auto-Answer, Auto-Dial Direct Connect Modem II (\$199) and Multi-Pak Interface (\$179)
- INPUT DEVICE: TRS-80 Touch Pad (\$59)

The CGP color graphics printer prints text, charts, or "doodles" using four colored pens (on 4½-inch roll paper). A modem or a serial printer can be connected directly to the CoCo without the need for an additional interface. The RS-232 Program Pak allows you to connect both at once by giving you access to an additional serial port via the cartridge

slot. The Multi-Pak Interface allows the RS-232 Pak and the disk drive both to be connected permanently to the CoCo; however, only one can be used at a time.

**Dream System**

- DISPLAY: High-resolution Video Monitor and Word-Pak II (\$149), or Green Mountain Micro LowerKit III (\$129)
- STORAGE: Color Disk #2 (\$279)
- PRINTERS: CGP-220 Color Graphics Printer (\$699) or DWP-210 Daisy-Wheel Printer (\$599)
- MODEM: Radio Shack DC212 300/1200-Baud Modem (\$399)
- OTHER: Sound/Speech Cartridge (\$99), and/or RS-232C Selector Switch (\$149), and/or PBJ's PC-Pak Parallel Port and Clock (\$132)

The selector switch allows up to three different printers/modems/plotters to be connected permanently to the same serial port. LowerKit gives the CoCo lowercase capability. Word-Pak gives an 80-column display plus lowercase. (To use this you'll need a monitor, since TVs don't display 80 columns of text clearly.) LowerKit gives "full-time" lowercase, whereas Word-Pak lowercase has to be supported by software. The PC-Pak allows future use of high-quality parallel printers and gives you the current date and time.

—LANCE PAAVOLA

**MANUFACTURERS**

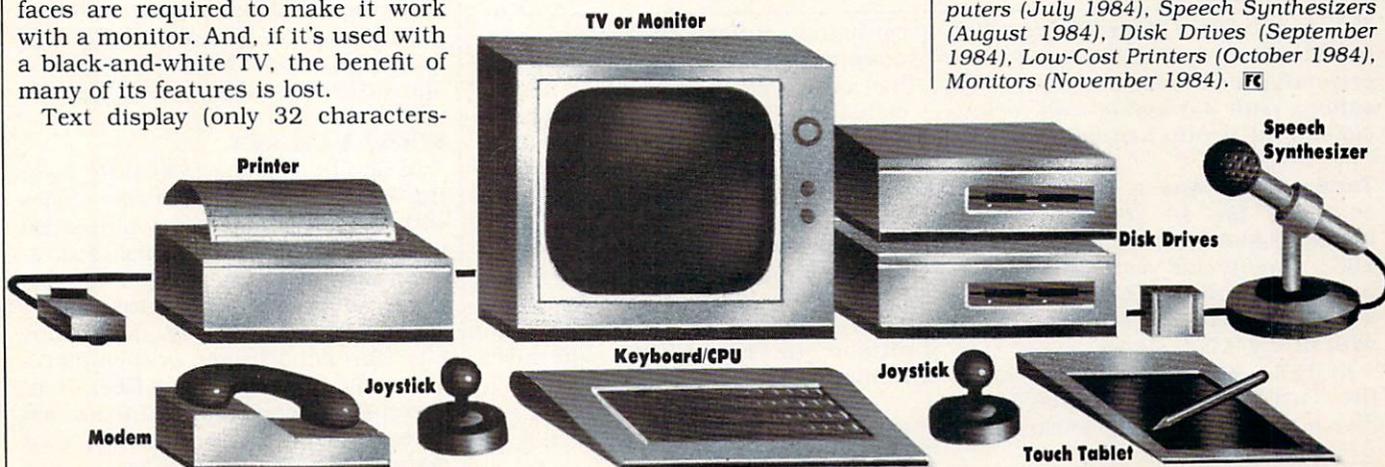
Space does not permit a listing of manufacturers' addresses here. Authorized computer dealers should have product information for major brands. Many smaller companies that rely on mail order may be found in the pages of Computer Shopper (P.O. Box F, Titusville, FL 32781; [305] 269-3211). The Electronic Industries Assoc. has listings of major computer manufacturers (EIA, 2001 Eye St., NW, Washington, DC 20006; [202] 457-4919).

For more product information, refer to past FAMILY COMPUTING Buyer's Guides: Computers (June 1984), Portable Computers (July 1984), Speech Synthesizers (August 1984), Disk Drives (September 1984), Low-Cost Printers (October 1984), Monitors (November 1984). ☐

**TRS-80 COLOR COMPUTER**

The CoCo, as the Color Computer is known, is designed to be used with a color TV. Special third-party interfaces are required to make it work with a monitor. And, if it's used with a black-and-white TV, the benefit of many of its features is lost.

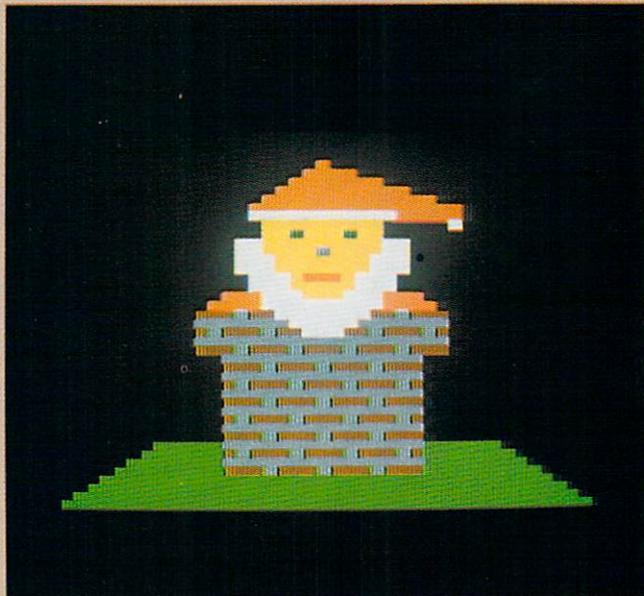
Text display (only 32 characters-



**3. DREAM SYSTEM.** The sky's the limit here—a music and/or speech synthesizer, touch (graphics) tablet, light pen, second printer (maybe color), RGB monitor, and mouse are all fair game. These and other add-ons will make the computer easier and more fun to use, and help expand your potential.

# SANTA CLAUS

BY JOEY LATIMER



Apple Version of Santa Claus

Santa Claus, or St. Nicholas, is an enduring symbol of the Christmas season. In fact, though, the familiar image of the bearded Santa in a red, fur-collared suit is a fairly modern idea. It's based on a newspaper illustration rendered only a little over 100 years

ago by the cartoonist Thomas Nast. Now, we've modernized Santa even further by bringing him to your computer screen in living color and animation! Type in the program as shown, SAVE it to disk or tape, and type RUN. Merry Christmas! Ho! Ho! Ho!

## ADAM & Apple/Santa Claus

```

10 HOME
20 GR
30 COLOR= 4
40 FOR Q = 32 TO 39
50 HLINE Q,39-Q AT Q
60 NEXT Q
70 FOR Q = 35 TO 17 STEP -1
80 FOR P = 12-2*(Q < 22) TO 26+2*(Q < 22)
90 COLOR= 5
100 IF Q/2 > INT(Q/2) AND (P-Q)/4 > INT((P-Q)/4) THEN CO
LOR= 8
110 PLOT P,Q
120 NEXT P,Q
130 COLOR= 9
140 FOR Q = 0 TO 6
150 HLINE 19-Q+(Q = 6),19+2*(Q-(Q = 6)) AT Q
160 NEXT Q
170 HLINE 12,26 AT 15
180 HLINE 11,27 AT 16
190 FOR Q = 9 TO 19
200 READ X
210 COLOR= 13
220 IF Q < 18 THEN HLINE 20-X,18+X AT Q-2
230 COLOR= 15
240 HLINE 18-X,20+X AT Q
250 NEXT Q
260 HLINE 14,24 AT 6
270 PLOT 29,7
280 COLOR= 4

```

```

290 PLOT 17,8
300 PLOT 21,8
310 COLOR= 5
320 PLOT 19,10
330 COLOR= 9
340 HLINE 18,20 AT 13
350 FOR DL = 1 TO RND(1)*2000+500:NEXT DL
360 COLOR= 22-SCRN(17,12)
370 PLOT 17,12
380 PLOT 21,12
390 GOTO 350
1000 DATA 5,5,5,5,4,4,3,3,2,1,0

```

## Atari/Santa Claus

```

10 S=(PEEK(106)-4)*256
20 POKE 106,S/256
30 GRAPHICS 17
40 SETCOLOR 2,0,15
50 FOR X=S+264 TO S+351
60 READ Q
70 POKE X,Q
80 NEXT X
90 POKE 756,S/256
100 FOR Y=14 TO 19
110 FOR X=19-Y TO Y
120 COLOR 98-((X+Y)/2=INT((X+Y)/2))
130 PLOT X,Y
140 NEXT X
150 NEXT Y
160 FOR Y=9 TO 18
170 COLOR 67
180 IF Y/2=INT(Y/2) THEN COLOR 68
190 FOR X=5-(Y<11) TO 14+(Y<11)
200 PLOT X,Y
210 NEXT X
220 NEXT Y
230 FOR Y=1 TO 4
240 FOR X=10-Y TO 8+Y*2
250 COLOR 229-3*(X=10-Y)-4*(X=8+Y*2)
260 PLOT X,Y-1
270 NEXT X
280 NEXT Y
290 FOR X=5 TO 13
300 COLOR 229-3*(X=5)-4*(X=13)
301 PLOT X,8
302 NEXT X
310 FOR Y=3 TO 12
320 COLOR 197+(Y=3)
330 FOR X=7-(Y=3)+(Y-10)*(Y>9) TO 11+(Y=3)-(Y-10)*(Y>9)
340 PLOT X,Y
350 NEXT X
360 NEXT Y
370 FOR Q=1 TO 7
380 READ C0,X,Y
390 COLOR C0
400 PLOT X,Y
410 NEXT Q
420 COLOR 200
430 IF RND(0)<0.4 THEN COLOR 203
440 PLOT 8,5
450 PLOT 10,5
460 COLOR 202
470 IF RND(0)<0.4 THEN COLOR 203
480 PLOT 9,8
490 FOR DELAY=1 TO 200
500 NEXT DELAY
510 GOTO 420
1000 DATA 240,248,252,254,255,255,255,255
1010 DATA 15,31,63,127,255,255,255,255
1020 DATA 0,0,239,239,239,239,0,0
1030 DATA 0,0,127,127,127,127,0,0
1040 DATA 255,255,255,255,255,255,255,255
1050 DATA 0,102,60,255,60,102,0,0

```

```

80 POKE 7680+C0+22*RO,CH
90 POKE 38400+C0+22*RO,KO
100 NEXT CO,RO,X
110 FOR X=1 TO 5
120 READ CH,KO,LO
130 POKE LO,CH
140 POKE LO+30720,KO
150 NEXT X
160 MD=1
170 FOR DELAY=1 TO RND(1)*1000+2000
180 NEXT DELAY
190 IF RND(1)>0.5 THEN 240
200 POKE 7843,174+MD*54
210 POKE 7845,174+MD*54
220 FOR DELAY=1 TO 300
230 NEXT DELAY
240 POKE 7931,202+MD*11
250 POKE 7933,203-MD*2
260 MD=1-MD
270 GOTO 170
1000 DATA 22,19,214,1,0,20,1,19,2,18,3,17,22,11,219,4
1010 DATA 4,16,4,16,4,16,4,16,4,16,4,16,4,16,4,16,4,16
1020 DATA 3,17,3,17,3,17,10,9,160,2,4,16,5,15,15,8,160
1030 DATA 1,10,10,9,11,8,12,7,13,7,13,6,14,6,14,6,14
1040 DATA 11,7,160,3,9,11,8,12,8,12,7,13,6,14,6,1,160
1050 DATA 2,15,17,15,17,6,16,7,15,8,14,9,13,6,5,160
1060 DATA 1,6,14,6,14,198,3,7932,150,3,7888,174,3
1070 DATA 7843,174,3,7845,42,1,7852
    
```

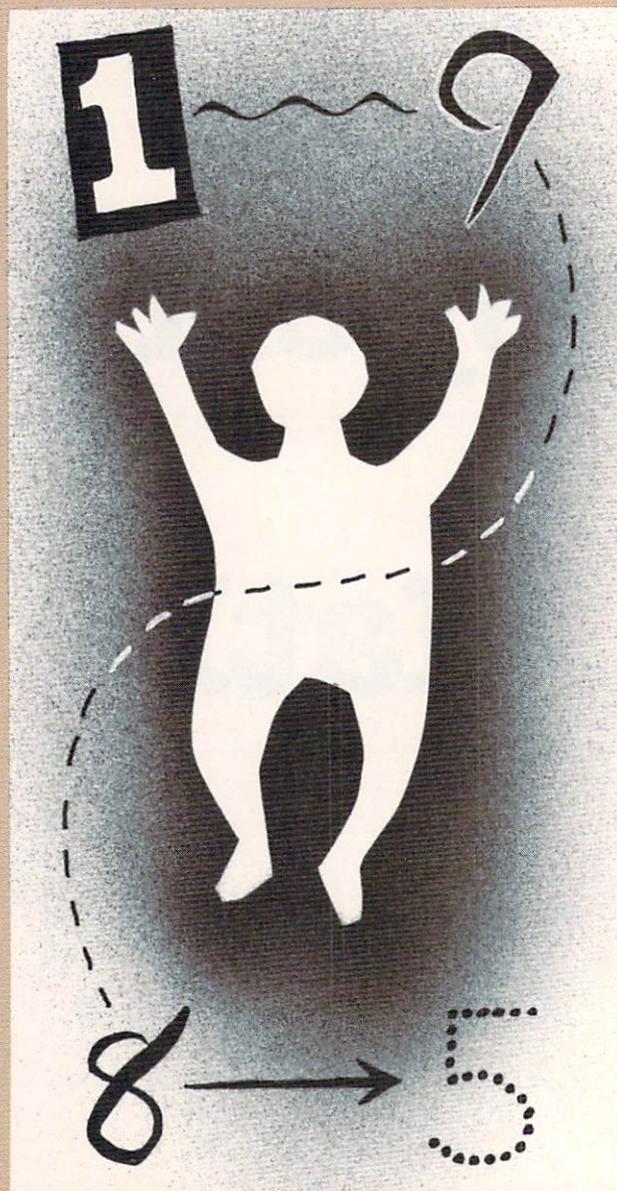
**TIPS TO THE TYPIST**

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

- pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.
4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.
5. When all else fails . . . turn off the computer and relax.

**NEW YEAR'S EVE**

BY JOEY LATIMER



You and your trusty computer have gone through some fun times in 1984. So this December 31, why not gather your family 'round the screen and all ring in the new year together! Our *New Year's Eve* program is a blast and then some—it's almost as much fun (and nearly as noisy!) as watching the ball drop in New York's Times Square!

Type in the program exactly as shown, and SAVE it to disk or tape. Be especially careful when entering the DATA statements! We advise you to test RUN

the program well before the hour of midnight. That way, you can correct any typing errors before they can spoil the fun (*see Tips to the Typist*).

When you RUN the program, the first thing you'll see is a prompt telling you to enter the current time in hours, minutes, and seconds. Enter the time in six digits, without any intervening spaces or punctuation (example: 9:55:02 p.m. is entered as 095502); press RETURN or ENTER. At five seconds to midnight, things should start popping!

ILLUSTRATIONS BY JOSH COSFIELD

## HOLIDAY PROGRAMS

### ADAM/New Year's Eve

```

10 LOMEM: 29000
20 DIM bin(7), Lt(29), f(30), s(30), d(30)
30 FOR x = 0 TO 7
40 bin(x) = 2^x
50 NEXT x
60 FOR x = 1 TO 29
70 READ Lt(x)
80 NEXT x
90 FOR x = 1 TO 30
100 READ f(x), s(x), d(x)
110 NEXT x
120 FOR x = 28000 TO 28005
130 READ ml
140 POKE x, ml
150 NEXT x
160 fl = 0
170 HOME
180 PRINT "TO SET THE COMPUTER CLOCK,"
190 PRINT "PLEASE INPUT THE TIME IN"
200 PRINT "HOURS, MINUTES, AND SECONDS"
210 PRINT "(E.G., 095502); THEN PRESS"
220 PRINT "<RETURN>."
230 PRINT
240 INPUT "WHAT TIME IS IT NOW?"; tim$
250 IF LEN(tim$) <> 6 THEN 170
260 ts = 0
270 FOR x = 1 TO 6
280 IF VAL(MID$(tim$, x, 1)) = 0 AND MID$(tim$, x, 1) <> "0"
    THEN ts = 1: x = 6
290 NEXT x
300 IF ts = 1 THEN 170
310 hrs = VAL(LEFT$(tim$, 2))
320 min = VAL(MID$(tim$, 3, 2))
330 sec = VAL(RIGHT$(tim$, 2))
340 IF hrs < 1 OR hrs > 12 OR min < 0 OR min > 59 OR s
    ec < 0 OR sec > 59 THEN 170
350 tim = hrs*3600+min*60+sec
360 HOME
370 IF tim >= 43195 AND tim <= 43200 THEN 490
380 FOR de = 1 TO 900
390 NEXT de
400 tim = tim+1
410 IF tim >= 46800 THEN tim = 3600
420 hrs = INT(tim/3600)
430 min = INT((tim-hrs*3600)/60)
440 sec = tim-hrs*3600-min*60
450 HTAB 13
460 VTAB 10
470 PRINT STR$(hrs);":":CHR$(48*(min < 10));STR$(min);
    "":CHR$(48*(sec < 10));STR$(sec);" "
480 GOTO 370
490 HOME
500 GR
510 FOR x = 700 TO 100 STEP -10
520 pitch = 112406/x
530 two = INT(pitch/16)
540 one = 128+pitch-(two*16)
550 POKE 28006, one:CALL 28000
560 POKE 28006, two:CALL 28000
570 POKE 28006, 144:CALL 28000
580 FOR d = 1 TO 70-(x/10)
590 NEXT d
600 NEXT x
610 POKE 28006, 159:CALL 28000
620 FOR x = 1 TO 50
630 GOSUB 1000
640 NEXT x
650 COLOR= INT(RND(1)*15)+1
660 FOR bitmap = 1 TO 29
670 l = Lt(bitmap)
680 FOR q = 7 TO 0 STEP -1
690 IF l < bin(q) THEN 760
700 l = l-bin(q)
710 IF fl = 1 THEN COLOR= INT(RND(1)*15)+1
720 VLINE 4*(7-q), 4*(7-q)+1 AT bitmap+4

```

```

730 IF fl = 1 THEN COLOR= INT(RND(1)*15)+1
740 VLINE 4*(7-q)+2, 4*(7-q)+3 AT bitmap+4
750 GOSUB 1000
760 NEXT q
770 NEXT bitmap
780 FOR x = 1 TO 30
790 POKE 28006, f(x):CALL 28000
800 POKE 28006, s(x):CALL 28000
810 POKE 28006, 144:CALL 28000
820 FOR de = 1 TO d(x)*200
830 NEXT de
840 POKE 28006, 159:CALL 28000
850 NEXT x
860 fl = NOT fl
870 GOTO 510
1000 POKE 28006, 240:CALL 28000
1010 POKE 28006, 228:CALL 28000
1020 FOR de = 1 TO 20
1030 NEXT de
1040 POKE 28006, 255:CALL 28000
1050 RETURN
2000 DATA 0,0,129,255,1,0,0
2010 DATA 0,224,160,161,255,1,0,0
2020 DATA 0,239,145,145,239,0,0,0
2030 DATA 0,226,145,145,142,0
3000 DATA 141,35,2,141,26,3,135,28,1,141,26,2,132,21,2
3010 DATA 142,23,3,133,25,1,142,23,2,132,21,1,142,23,1
3020 DATA 141,26,3,141,26,1,132,21,2,142,17,2,143,15,6
3030 DATA 143,15,2,142,17,3,132,21,1,132,21,2,141,26,2
3040 DATA 142,23,3,133,25,1,142,23,2,132,21,1,142,23,1
3050 DATA 141,26,3,142,31,1,142,31,2,141,35,2,141,26,6
4000 DATA 58,102,109,211,255,201

```

### Apple/New Year's Eve

```

10 DIM BIN(7), LT(29), N(30), D(30)
20 FOR X = 0 TO 7
30 BIN(X) = 2^X
40 NEXT X
50 FOR X = 1 TO 29
60 READ LT(X)
70 NEXT X
80 FOR X = 1 TO 30
90 READ N(X), D(X)
100 NEXT X
110 FOR X = 0 TO 28
120 READ ML
130 POKE 768+X, ML
140 NEXT X
150 FL = 0
160 HOME
170 PRINT "TO SET THE COMPUTER CLOCK, PLEASE"
180 PRINT "INPUT THE TIME IN HOURS, MINUTES,"
190 PRINT "AND SECONDS (E.G., 095502);"
200 PRINT "THEN PRESS <RETURN>."
210 PRINT
220 INPUT "WHAT TIME IS IT NOW?"; TMS
230 IF LEN(TMS) <> 6 THEN 160
240 TS = 0
250 FOR X = 1 TO 6
260 IF VAL(MID$(TMS, X, 1)) = 0 AND MID$(TMS, X, 1) <> "
    0" THEN TS = 1: X = 6
270 NEXT X
280 IF TS = 1 THEN 160
290 HRS = VAL(LEFT$(TMS, 2))
300 MIN = VAL(MID$(TMS, 3, 2))
310 SEC = VAL(RIGHT$(TMS, 2))
320 IF HRS < 1 OR HRS > 12 OR MIN < 0 OR MIN > 59 OR S
    EC < 0 OR SEC > 59 THEN 160
330 TIM = HRS*3600+MIN*60+SEC
340 HOME
350 IF TIM >= 43195 AND TIM <= 43200 THEN 470
360 FOR DE = 1 TO 561
370 NEXT DE

```

# BY INVITATION ONLY

## An Exclusive New Year's Eve Party You Won't Want To Miss!

**PUZZLE BY PETER FAVARO**  
**PROGRAM BY STEVEN C.M. CHEN**

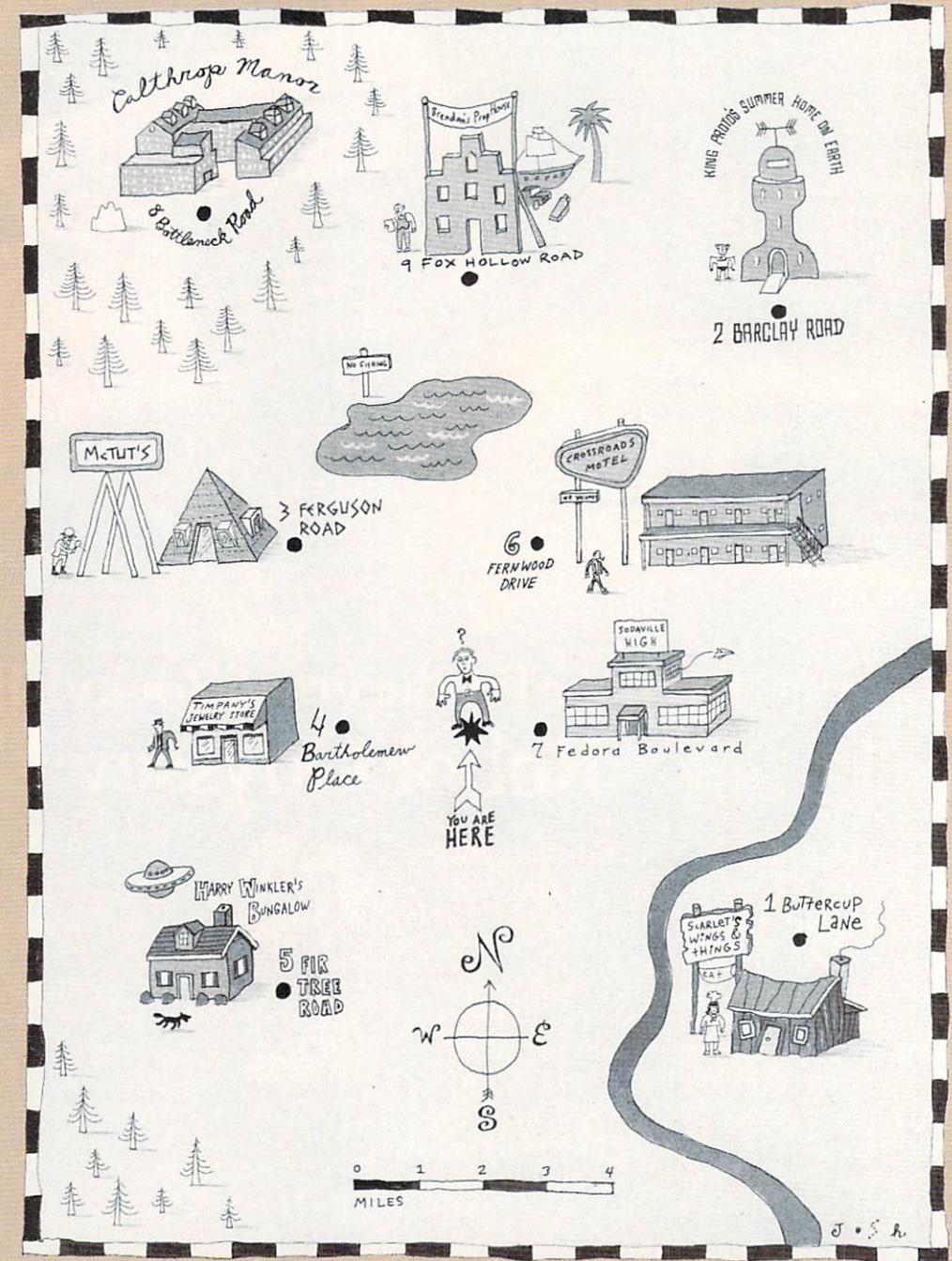
It arrives in the mail on Dec. 31, 1984, in a curious-looking envelope decorated with what at first appear to be candy canes. On closer inspection they turn out to be question marks — hundreds of them.

"What kind of odd holiday greeting could this be?" you wonder. You check the postmark and with great difficulty make out the letters D O R M I R. The name sounds familiar but you're not quite sure why. "Do I have an aunt or a cousin living on a Dormir Road or a Dormir Lane?" you ask. "No, that's not it . . ."

You examine the envelope more closely and notice that the flap is sealed shut with a seal that reads: FROM THE ROYAL PALACE OF PROTO. "Proto? Where have I heard that name before?"

As you slide your thumb under the flap and pop it open you make the connection: *Proto and The Dormirians!* That's it! They were in one of my favorite FAMILY COMPUTING puzzles! (*April 1984 issue.*)

Eagerly you tear the envelope open. Inside is an invitation to a very exclusive New Year's Eve party being thrown by King Proto and all of the characters from FAMILY COMPUTING's 1984 puzzles! Everyone will be there: The high school sweethearts Kurt and Dede (*February 1984*); the mischievous chefs (*June 1984*); and even Frank ("Fingers") Larson, temporarily released from jail!



But where is the party being held? Although the postmark shows that the envelope was mailed from the planet Dormir, the invitation states that the

party will be held on Earth—and not necessarily at King Proto's summer home! A map (shown) is included with the invitation and shows the nine

places where the party could be held. It also includes your home. But unfortunately, the directions to the party are in code. In dismay you read...

LOTJ YOMT  
JG XWVL  
PGNJ SAOP  
WPVKN YQQFU  
BJ IJMOC  
RKQFI ZIBXOFKD  
DMSDQ GNTRD  
JLAXBB OAXV  
UBZ KHVD

The sun is beginning to set and soon the party will begin. You know you don't have time to chase from place to place at random, but if you carefully study the map, you'll find the keys to decode the directions. When you have figured out the code, use your Deluxe Dash Decoder machine (your computer) to unravel it.

**HOW TO PLAY**

Set your computer to all uppercase letters before playing *By Invitation Only*. After you type in your name, the Deluxe Dash Decoder machine will be ready to go. Two alphabets will appear on the screen. The bottom alphabet will remain stationary. To shift the top alphabet press "B" (to go backward) or "F" (to go forward.) For example, if you press the "F" key once, the top alphabet will shift forward by one letter so that the upper A will be positioned over the lower B. This sets the machine to

decode all A's to Bs, all Cs to Ds, etc.

When you discover the proper setting to decode each line of the instructions, press "D" to decode. Type in one line of the coded directions, then press RETURN or ENTER.

A "decoded" line will appear on the screen. You will then be asked if the line is correctly decoded. If English words are formed (and you have not made any typos), press "Y" for yes. (The computer will not accept any directions with typos.) If gibberish appears on the screen, press "N" and adjust the Deluxe Dash Decoder machine to a different offset or enter another line to be decoded at the same setting.

The decoder machine will store every correctly decoded line. These can be read at any point by typing "R". If you have trouble decoding any of the directions, type "H" (after typing "R") for a helpful hint.

Once you have correctly decoded all nine lines, the full directions to the party will appear on the screen. Press a key, and you will arrive at the party. We hope you have a wonderful time and a very happy new year! (The solution will appear in next month's issue.)

**Base Version (TRS-80 Model III)  
By Invitation Only**

```
10 CLEAR 900: DIM D1$(10), D2$(9), M$(3)
20 WL=64: PI=6: TRU=-1: TX=0: DL=100: TAS=""
50 TS=(WL-26)/2+TX: TD=(WL-13)/2+TX: C=0
60 READ M$(0): M$(1)="" : READ M$(2): M$(3)=""
70 FOR I=1 TO 9: D2$(I)="" : NEXT I: S1$="A"
80 FOR I=66 TO 90: S1$=S1$+CHR$(I): NEXT I
90 S2$=S1$: PS="" : PRESS ANY KEY TO CONTINUE."
100 FOR I=1 TO 10: TS="" : FOR J=1 TO 2+TRU*(I-10)*6
110 READ AS: V=ASC(LEFT$(AS,1))-64: FOR Z=2 TO LEN(AS)
120 N=ASC(MID$(AS,Z,1))-V
130 TS=TS+CHR$(N+TRU*26*(N<65)): NEXT Z: TS=TS+" "
140 NEXT J: D1$(I)=LEFT$(TS,LEN(TS)-1): NEXT I
150 CLS: PRINT "WHAT IS YOUR NAME";
160 INPUT NAS: IF NAS="" OR LEN(NAS)>WL-1 THEN 150
170 CLS: NS="DELUXE DASH DECODER": GOSUB 2000: PRINT
180 PRINT TAB(TS); "CURRENT SETTING:"
190 Y=3: X=TS+17-TRU*(C=0): GOSUB 3000: B=SGN(C)+1
200 PRINT M$(B); TAS; ABS(C); M$(1+2*TRU*(B=1)); " "
210 PRINT TAB(TS); S1$: PRINT TAB(TS); S2$: GOSUB 4000
220 RS="SET DECODER USING <B> (BACKWARD) OR <F>"
230 RS=RS+" (FORWARD) KEY; PRESS <D> TO DECODE OR <R>"
240 RS=RS+" TO READ DECODED DIRECTIONS.": GOSUB 1000
250 KS=INKEY$: IF KS="B" OR KS="F" THEN 340
260 ON ABS(KS="D") GOTO 380: IF KS<>"R" THEN 250
270 CLS: PRINT: NS="DECODED DIRECTIONS": GOSUB 2000
```

```
280 PRINT: FOR I=1 TO 9: PRINT TAB(TD); D2$(I): NEXT I
290 PRINT: RS="PRESS <H> FOR HELP OR ANY OTHER KEY TO C
CONTINUE.": GOSUB 1000
300 KS=INKEY$: IF KS="" THEN 300 ELSE IF KS<>"H" THEN 1
70
310 CLS: RS=D1$(10)+" ": GOSUB 1000: GOSUB 4000
320 NS=PS: GOSUB 2000
330 IF INKEY$="" THEN 330 ELSE 170
340 IF (C>24 AND KS="F") OR (C<-24 AND KS="B") THEN 25
0
350 C=C+TRU*((KS="F")-(KS="B")): IF KS="F" THEN 370
360 S1$=MID$(S1$,2)+LEFT$(S1$,1): GOTO 190
370 S1$=RIGHT$(S1$,1)+LEFT$(S1$,25): GOTO 190
380 Y=7: X=0: GOSUB 3000: PRINT "CODED WORDS"; WCS=""
390 INPUT WCS: IF WCS="" THEN 380
400 WDS="": FOR I=1 TO LEN(WCS): TS=MID$(WCS,I,1)
410 IF TS<"A" OR TS>"Z" THEN 440
420 IC=ASC(TS)+C
430 TS=CHR$(IC+TRU*26*((IC<65)-(IC>90)))
440 WDS=WDS+TS: NEXT I: PRINT TAB(13); WDS
450 PRINT: PRINT "CORRECTLY DECODED?";
460 KS=INKEY$: IF KS="N" THEN 170
470 IF KS<>"Y" THEN 460
480 CC=0: FOR I=1 TO 9: IF D1$(I)=WDS THEN D2$(I)=WDS
490 IF D1$(I)=D2$(I) THEN CC=CC+1
500 NEXT I: IF CC>9 THEN 170
510 CLS: NS="DIRECTIONS TO PARTY": GOSUB 2000: PRINT
520 FOR I=1 TO 9: PRINT TAB(TD); D2$(I): NEXT I
530 PRINT: NS=PS: GOSUB 2000
540 IF INKEY$="" THEN 540
550 CLS: RS="YOU FOLLOW THESE DIRECTIONS AND ARRIVE"
560 RS=RS+" AT THE PARTY, WHERE YOU HEAR ..."
570 GOSUB 1000: LN=LEN(NS): BG=TRU*(LN<WL-17)
580 FOR D=1 TO 2000: NEXT D: FOR I=1 TO 100
590 CLS: Y=RND(15): X=RND(WL-LN-1-BG*16)+TX
600 GOSUB 3000: PRINT "HAPPY NEW YEAR,";
610 PRINT STRING$(1+(1-BG)*(WL-16),32); NAS;"!"
630 FOR D=1 TO DL: NEXT D, I: CLS: END
1000 IF LEN(RS)<WL THEN NS=RS: GOSUB 2000: RETURN
1010 J=WL+1: K=1: FOR I=J TO 2 STEP -1
1020 IF MID$(RS,I,1)="" THEN K=0: J=I: I=2
1030 NEXT I: NS=LEFT$(RS,J-1): GOSUB 2000
1040 RS=RIGHT$(RS,LEN(RS)-J+K): GOTO 1000
2000 IF LEN(NS)=WL THEN PRINT NS: RETURN
2010 PRINT TAB((WL-LEN(NS))/2+TX); NS: RETURN
3000 PRINT@ (Y-1)*WL+X, " "; RETURN
4000 FOR I=1 TO PI: PRINT: NEXT I: RETURN
5000 DATA BACKWARD, FORWARD, SYBGW, EXNLS, QSP, SIHGW
5010 DATA JDBEX, IFNBC, EZSYNQ, LIAAPE, IPX, QEFIKY
5020 DATA NIBHWZ, DGPIEVMRK, RWFLWJ, FNUAYK, KLNCZDD
5030 DATA VBNKI, TVCA, MEBPX, IRW, NRIS, MZRNPFER
5040 DATA FEUA, TWUH, PIEBLU, WQEPF, EUZEEQJ
```

**Atari/By Invitation Only**

```
10 DIM AS(9), CLS(1), D1$(128), D2$(88), DP(10), M$(24)
20 DIM TS(41), NAS(39), PS(26), S1$(26), S2$(26), SP$(25), W
CS(16), WDS(16)
30 SP$="" : SP$(25)=SP$: SP$(2)=SP$: C=0: CLS=CHR$(125)
40 OPEN #1,4,0,"K": POKE 82,0
50 MS="BACKWARD": M$(17)="FORWARD "
60 FOR I=9 TO 16: M$(I,1)=CHR$(31-(I>12)): NEXT I
70 D2$="" : D2$(88)="" : D2$(2)=D2$
80 FOR I=65 TO 90: S1$(I-64)=CHR$(I): NEXT I
90 S2$=S1$: PS="" : PRESS ANY KEY TO CONTINUE."
100 FOR I=1 TO 10: TS="" : FOR J=1 TO 2+(I-10)*6
110 READ AS: V=ASC(AS)-64: FOR Z=2 TO LEN(AS)
120 N=ASC(AS(Z))-V: TS(LEN(TS)+1)=CHR$(N+26*(N<65))
130 NEXT Z: TS(LEN(TS)+1)="" : NEXT J
140 DP(I)=LEN(D1$)+1: D1$(DP(I))=TS(1,LEN(TS)-1): NEXT I
150 PRINT CLS; "WHAT IS YOUR NAME";
160 INPUT NAS: IF NAS="" THEN 150
170 POKE 752,1
180 PRINT CLS; SP$(1,10); "DELUXE DASH DECODER": PRINT
190 PRINT SP$(7,7); "CURRENT SETTING:"
200 POSITION 24,2: PRINT SP$
210 B=SGN(C)+1: POSITION 24-(B=1),2
```

\*\*\*\*\*



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\*\*\*\*\*

PUZZLE

```

380 IF (C>24 AND K$="F") OR (C<-24 AND K$="B") THEN 28
0
390 C=C-(K$="F")+(K$="B"):IF K$="F" THEN 410
400 S1$=MID$(S1$,2)+LEFT$(S1$,1):GOTO 160
410 S1$=RIGHT$(S1$,1)+LEFT$(S1$,25):GOTO 160
420 Y=9:X=0:GOSUB 1000:PRINT "CODED WORDS?":WCS=""
430 INPUT WCS:IF WCS="" THEN 420
440 WDS="":FOR I=1 TO LEN(WCS):TS=MID$(WCS,I,1)
450 IF TS<"A" OR TS>"Z" THEN 470
460 IC=ASC(TS)+C:TS=CHR$(IC-26*((IC<65)-(IC>90)))
470 WDS=WDS+TS:NEXT I:PRINT TAB(2);BAS;WDS;BLS
480 PRINT "CORRECTLY DECODED?";
490 GET K$:IF K$="N" THEN 140
500 IF K$<>"Y" THEN 490
510 CC=0:FOR I=1 TO 9:IF D1$(I)=WDS THEN D2$(I)=WDS
520 IF D1$(I)=D2$(I) THEN CC=CC+1
530 NEXT I:IF CC<>9 THEN 140
540 PRINT CL$;" DIRECTIONS TO PARTY":PRINT
550 FOR I=1 TO 9:PRINT TAB(5);D2$(I):NEXT I:PRINT
560 PRINT SPC(3);"PRESS ANY KEY TO";SPC(9);"CONTINUE."
570 GET K$:IF K$="" THEN 570
580 PRINT CL$;SPC(3);"YOU FOLLOW THESE"
590 PRINT "DIRECTIONS AND ARRIVE"
600 PRINT " AT THE PARTY, WHERE";SPC(7);"YOU HEAR ..."
610 FOR D=1 TO 2000:NEXT D:LN=LEN(NAS):BG=-LN>5
620 FOR I=1 TO 100:PRINT CL$;Y=RND(0)*21
630 X=RND(0)*(7-(1+LN)*(1-BG)-(15-LN)*(LN>15)):GOSUB 1
000
640 PRINT "HAPPY NEW YEAR,";SPC(1+BG*6);NAS;"!"
650 POKE 36878,15:FOR J=128 TO 254 STEP 10
660 POKE 36876,J:FOR D=1 TO 50:NEXT D
670 NEXT J,I:PRINT CL$;POKE 36878,0:END
1000 POKE 214,Y:PRINT:PRINT TAB(X):RETURN
2000 DATA BACKWARD, FORWARD, SYBGW, EXNLS, QSP, SIHW
2010 DATA JDEBX, IFNBC, EZSYNQ, LIAAPE, IPX, QEFIKY
2020 DATA NIBHWZ, DGPIEVMRK, RWFLWJ, FNUAYK, KLNCZDD
2030 DATA VBNKI, TVCA, MEBPX, IRW, NRIS, MZRNFRH
2040 DATA FEUA, TWUHMIFFY, WQEPF, EUZEEQJ
    
```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM & Apple/By Invitation Only

Use the base version, with the following alterations:  
Change CLS to HOME in lines 150, 170, 270, 310, 510, 550, and 630. Add line 620:  
620 PRINT CHR\$(7);  
Change lines 10, 190, 250, 300, 330, 380, 460, 540, 590, 610, and 3000 to read as follows:  
10 DIM D1\$(10), D2\$(9), MS(3)  
190 Y=3:X=TS+16-(C=0):GOSUB 3000:B=SGN(C)+1  
250 GET K\$:IF K\$="B" OR K\$="F" THEN 340  
300 GET K\$:IF K\$<>"H" THEN 170  
330 GET K\$:GOTO 170  
380 Y=7:X=0:GOSUB 3000:PRINT "CODED WORDS";  
460 GET K\$:IF K\$="N" THEN 170  
540 GET K\$  
590 HOME:Y=RND(1)\*22+1:X=RND(1)\*(WL-LN-1-BG\*16)+1  
610 PRINT SPC(1+(1-BG)\*(WL-16));NAS;"!"  
3000 VTAB Y:HTAB X+1:RETURN

Finally, if you have an ADAM, change line 20 to read  
20 WL=31:PI=13:TRU=1:TX=1:dL=200:TAS=""  
If you have an Apple, change line 20 to read  
20 WL=40:PI=13:TRU=1:TX=1:dL=100:TAS=""

Commodore 64/By Invitation Only

Use the base version, with the following alterations:  
Change CLS to PRINT CL\$; in lines 170, 270, 310, 510, and 550. Add lines 30, 40, and 620:



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## 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 of some programs follow the chart.

Here's a rundown of the ratings categories and what they mean: **●** = Overall performance, given the limita-

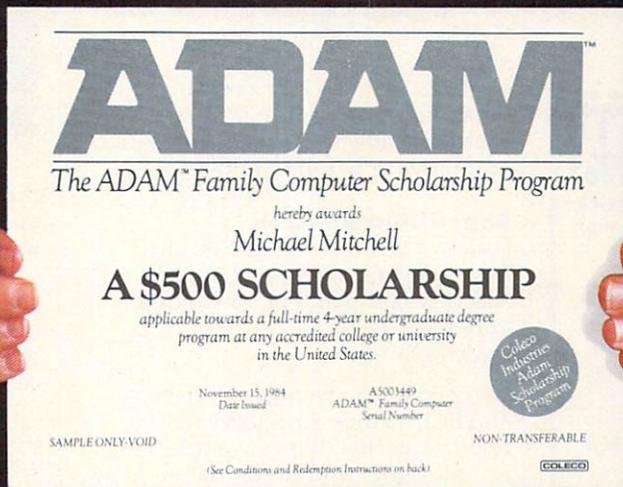
tions and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system, in the games reviews, the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

### HOME BUSINESS/HOME MANAGEMENT

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				●	D	EH	GQ	EU	V
<b>CALC RESULT</b> Handic Software 520 Fellowship Road, Suite B-206 Mount Laurel, NJ 08054 (609) 866-1001 \$79.95 ©1984	Powerful electronic spreadsheet best for statistical or business applications lets you use up to 32 pages, four at one time, thanks to split screens and "windows" through which you view other pages. —WOODS	C 64 (cart. and d.).	90-day warranty; user makes backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★
<b>HOME PAK</b> Batteries Included 17075 Sky Park N., Suite P Irvine, CA 92714 (714) 979-0920 \$49.95 ©1984	Three-in-one package includes word processing, electronic file, and telecommunications. System lets you edit text obtained "on-line" from the telecommunications package, and many other features. † —GELMAN	Reviewed on Atari Home Computers, 48K (d.). Also for C 64 (d.). Versions planned for Apple II series, Macintosh, IBM PCjr. Modem for telecommunications.	90-day warranty; user makes backup.	★ ★ ★ ★	@	★ ★ ★ ★	N/A	A	★ ★ ★ ★
<b>SMART LETTERS &amp; FORMS</b> Coleco 999 Quaker Lane S. West Hartford, CT 06110 (800) 842-1225 Approx. \$29 ©1984	Provides over 100 letters and forms for home use—everything from change of address notifications to thank-you notes, resumes, and letters to the editor. Store forms with <i>SmartFILER</i> , if desired. —DAVENPORT	ADAM (cart.).	90-day warranty.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
<b>PRACTICALC II</b> Practicorp (formerly Computer Software Associates) 44 Oak St. Newton Upper Falls, MA 02164 (617) 965-9870 \$69.95 ©1984	Electronic spreadsheet has 250 rows and 100 columns, and math functions that will handle a budget, checkbook, payroll, or most any other "number-crunching" situation you or your small business may require. † —LINCOLN	Apple II plus/Ile/Iic, 48K (d.).	90-day warranty; \$15 fee thereafter or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	E	★ ★ ★ ★
<b>YOUR PERSONAL NET WORTH</b> Scarborough Systems 25 N. Broadway Tarrytown, NY 10591 (914) 332-4545 \$79.95 (Apple, Atari, Commodore); \$99.95 (IBM) ©1984	Flexible home budgeting and accounting system helps you keep track of up to 420 different spending and income categories. Assumes no computing or accounting knowledge. † —BYRNE	Reviewed on C 64 (d.). Also for Apple II series, 64K (d.); Atari Home Computers, 48K (d.); IBM PC/PCjr, 128K (d.).	30-day warranty; \$5 fee thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★

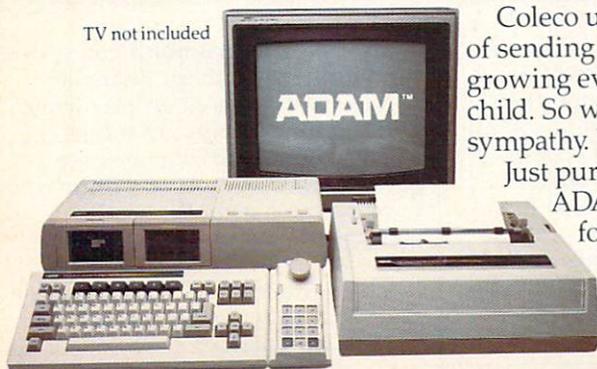
**RATINGS KEY** ● Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; @ Complete documentation not available at presstime † Longer review follows chart

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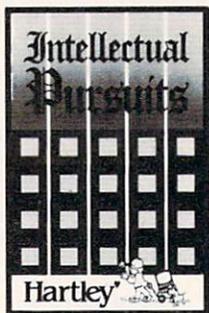
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