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VOLUME 3
NUMBER 1

Buyer's Guide to
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of '84

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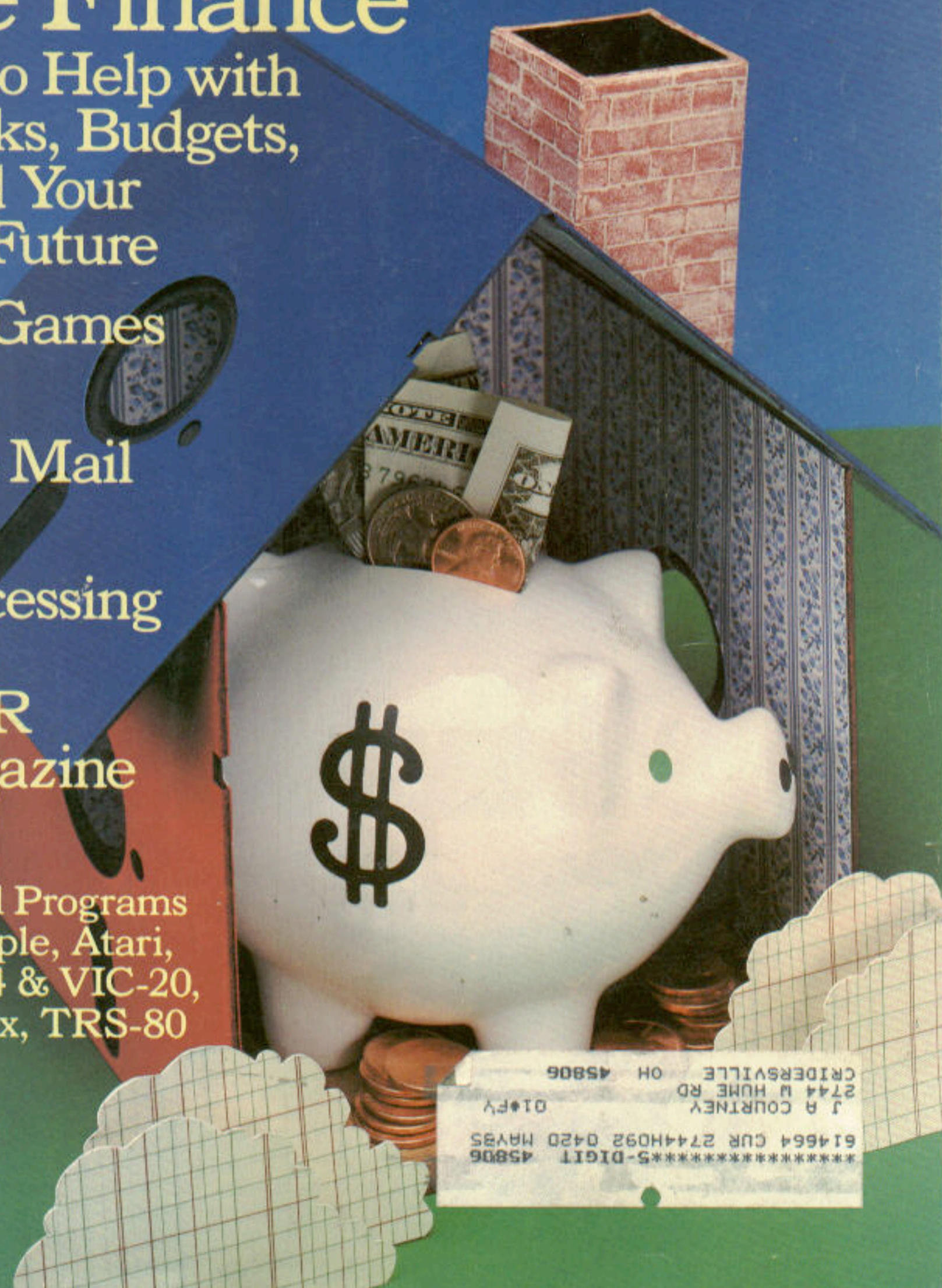
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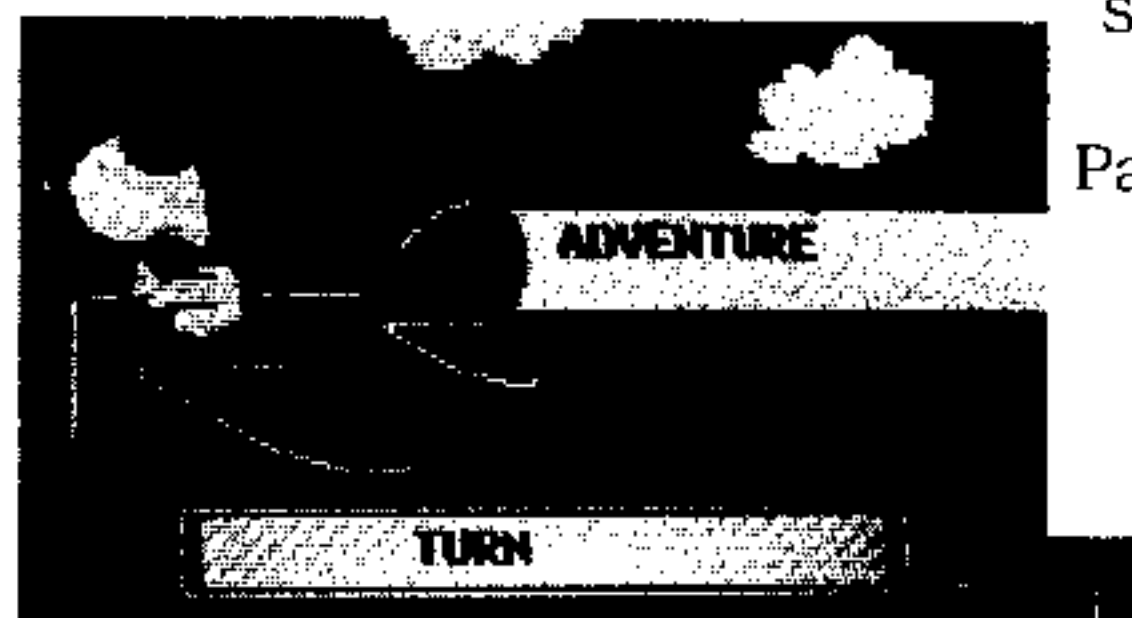
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Check out the FAMILY COMPUTING "Computing Family of the Year" Contest. Your family could win an exotic getaway to a Club Med resort. See details on page 87.

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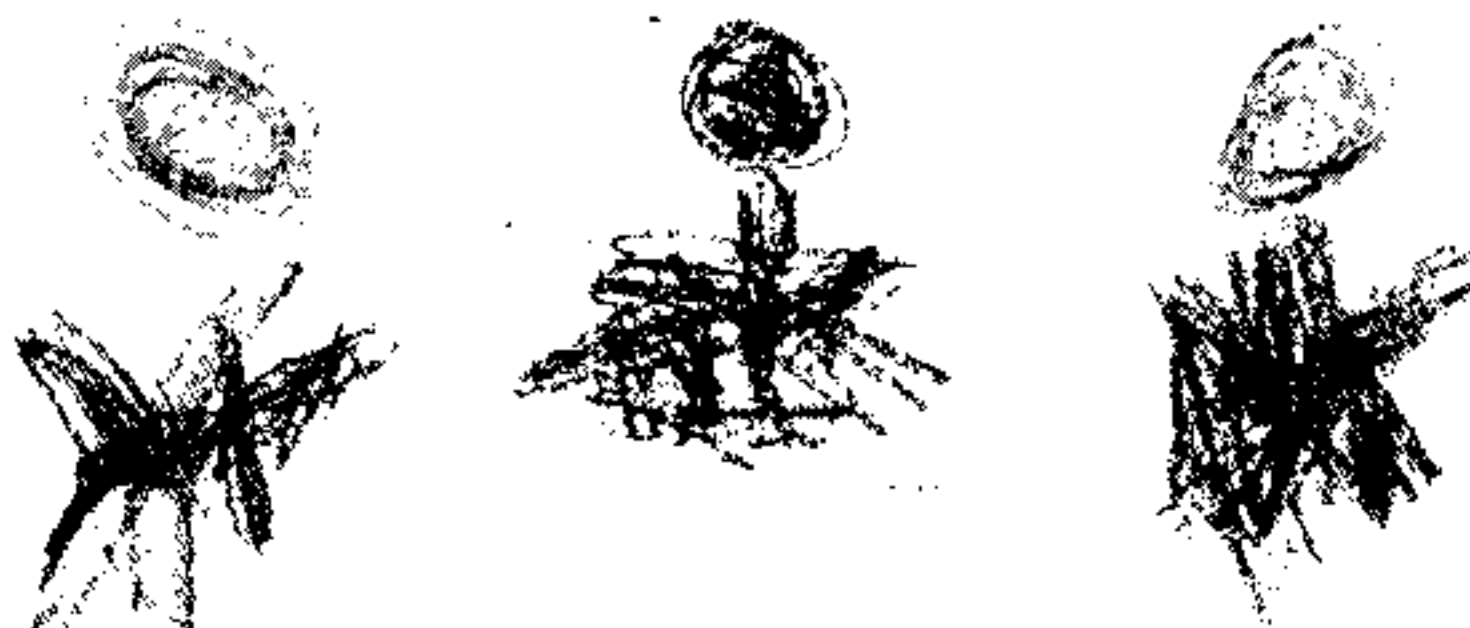


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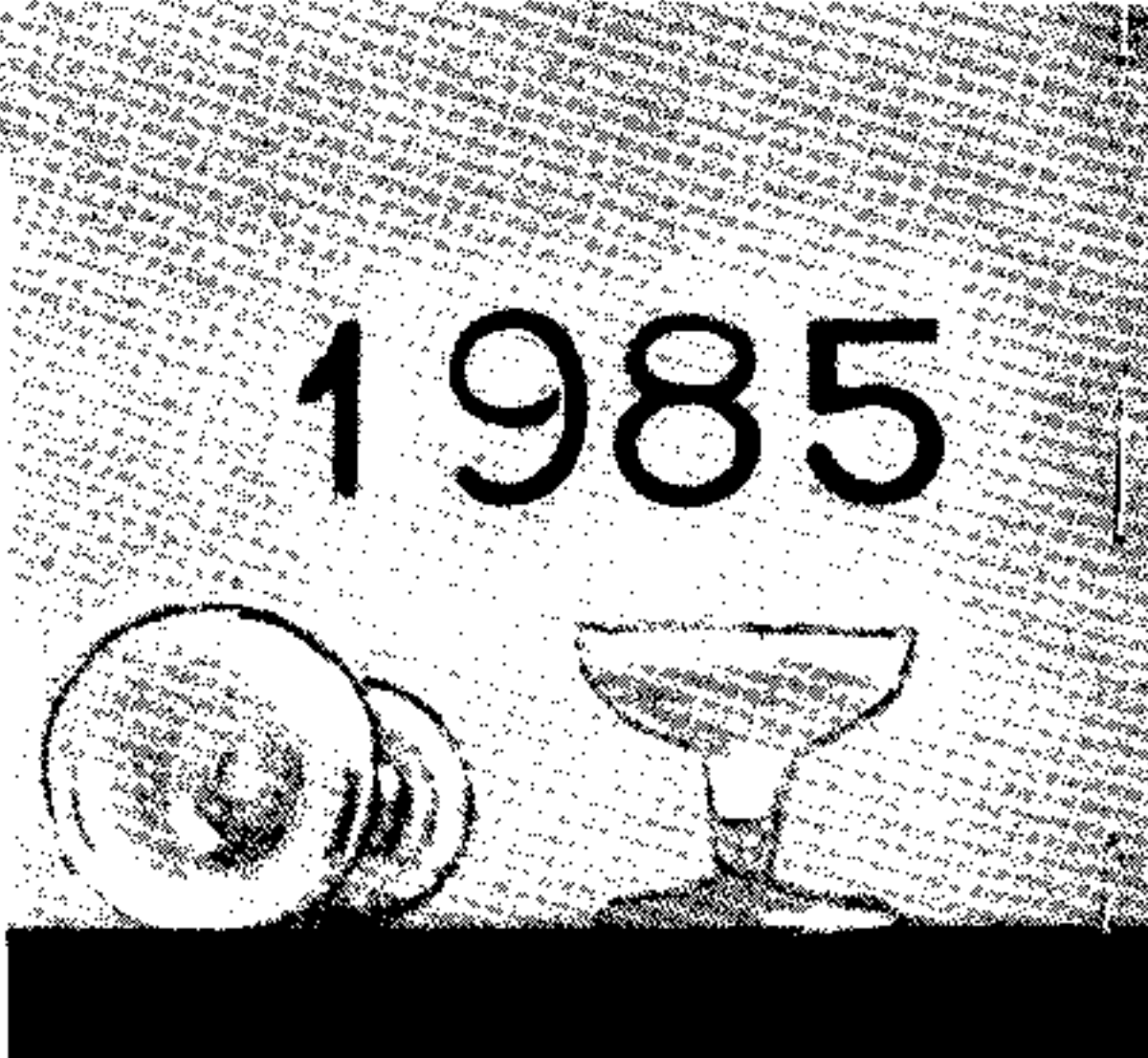
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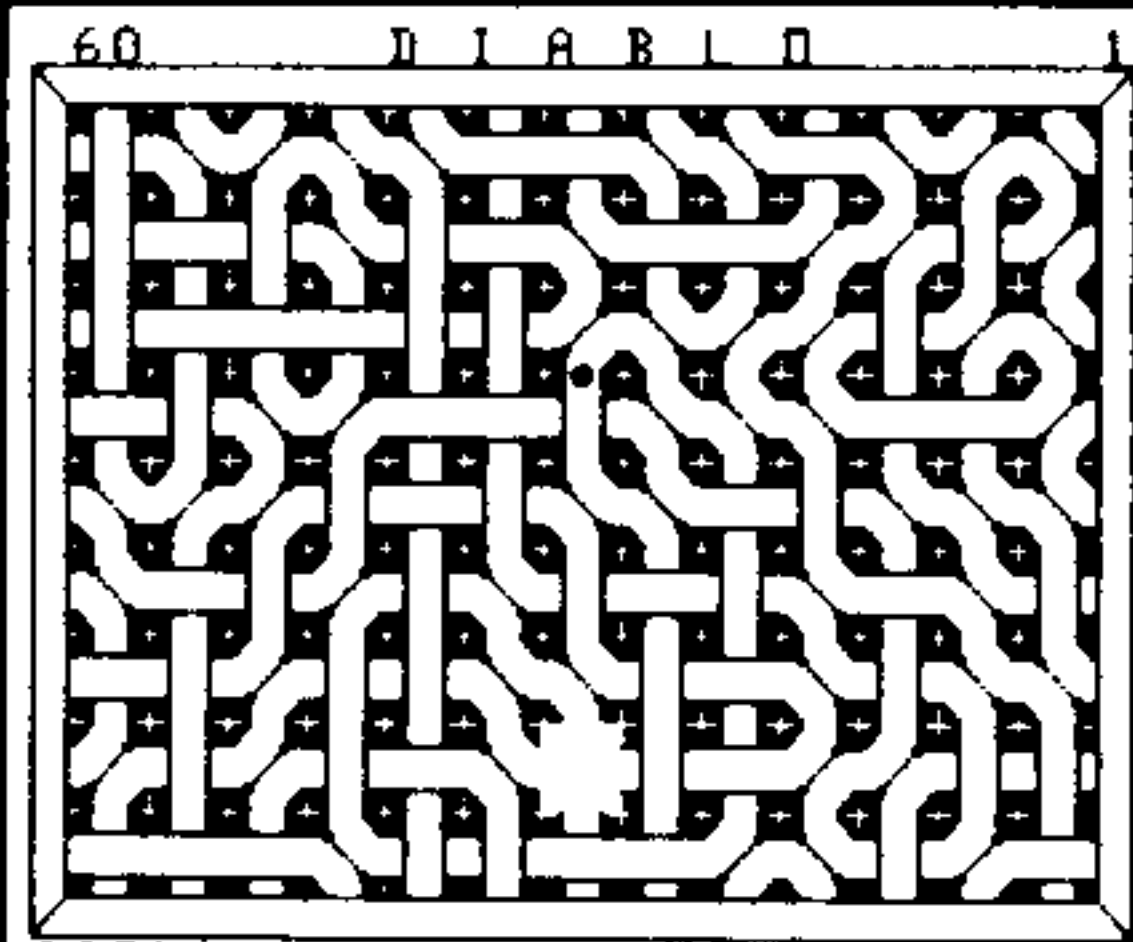
Dear Chris, Greg, and Scott:
Thank you for giving me finger paints. I like this present because I can make pictures. I opened it on Christmas Eve at Grandma and Grandpa Hanley's house. I was happy. I said, "Look, Finger Paints! I love them!" I'm going to paint a big picture and send it to you. Thank you again for the finger paints.

Love always, Betay



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BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

A Novel Event

Recently, the people of Seattle wrote a detective novel. How they did it was no mystery: They used two Eagle PCs hooked to terminals in an exhibit at a major arts festival.

The party responsible was **Invisible Seattle**, a group of actors, dancers, artists, and writers. Members of the group dressed as "literary workers" in hardhats and overalls, and, carrying tape recorders, roamed the town, "questioning" citizens about a mysterious (fictional) disappearance. A photo had been found, even a diary. Who was it? Whodunnit? Why?

People were invited to give their answers by writing in notebooks that had been placed in fast food shops all around town or by speaking into the tape recorders the "literary workers" carried. **Invisible Seattle** staffers typed the notes into the computer which printed out a new chapter every two hours. These were tacked to a wall at the festival, and the public was encouraged to make changes and suggestions.

Afterwards, responses were chosen randomly by the computer, and **Invisible Seattle** edited them into a coherent, 15-chapter book called *The Visible Invisible*. You can get an abridged version, also called *The Visible Invisible*, for \$3 from **Function Industries**, 2140 9th Ave. W, Apt. #1, Seattle, WA 98119.

Next year, the group plans a nationwide on-line encore, "Invisible America." Meanwhile, its literary bulletin board, **In.S.Omnia** [(206) 329-3099] runs several literary works-in-progress to which anyone with a computer and modem can contribute.—**ROXANE FARMANFARMAIAN**



Real estate agents are old hats at networking—the art of making contacts. They've been swapping problems and prospects for years. Now they can do it in "real time," electronically through **Charles Huggins' Exchange Network**, a new electronic information and telecommunications service specializing in real estate marketing.

With a computer and modem, the network lets members buy, sell, exchange, finance, and transfer real estate across the country. Members can arrange mortgages, set up escrows, and transfer titles via the network. It also features electronic mail, brainstorming, and consulting sessions, as well as access to legal, accounting, and tax advice.

Huggins, a long-time champion of networking as a way of marketing real estate, wants the new network eventually to include real estate traders, investors, builders, developers, and mortgage brokers. Membership in the **Exchange** currently costs \$4,000 for those who already have computers. It operates through **GE Information Services**.

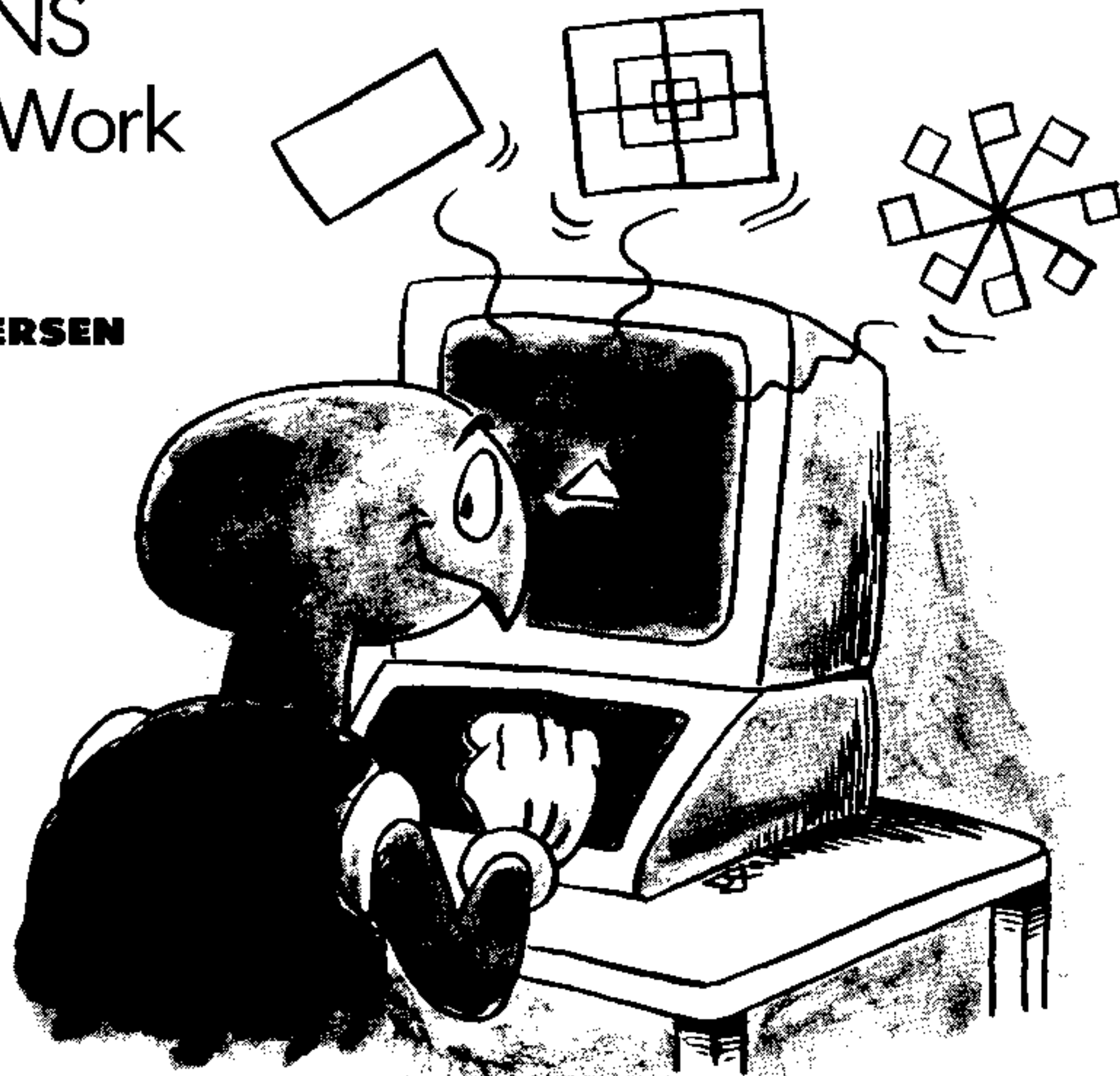
"As business people, our time is valuable," says **Huggins**. "The network lets us concentrate more on "problem solving" and less on selling because we can access and provide information to our customers."

Martin Reder, of **Reder Investments** in Santa Barbara, California, described a network transaction that involved sending drafts of an agreement to a broker from Boise, Idaho, who was temporarily located in Billings, Montana, about a parcel of land in Los Angeles. Now, that's covering ground.—**ROBIN RASKIN**

LEARNING LOGO

THEME AND VARIATIONS Make Your Procedures Work Harder with Variables

BY MINDY PANTIEL AND BECKY PETERSEN



ISSUE TOPIC

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

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

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

Over the past few months you've learned a lot of Logo.

If you've followed the series, you're likely to have mastered the basic tur-

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

tle-graphics commands (FD, BK, RT, LT, PU, and PD); learned how to use the REPEAT command; practiced writing, editing and debugging procedures; and learned to use one procedure as a subprocedure of another. This month, we're going to introduce a few more terms and concepts that will help make your procedures more powerful and flexible. First, we'll take a look at how Logo uses variables—names that stand for numeric values. Then we'll focus on a few more useful Logo commands.

VARIABLES

To see what variables are all about, let's start by looking back at one of our old procedures—SQUARE. If you've saved SQUARE on disk or tape, you can load it into your computer now (if you haven't, enter either of the procedures shown below). Call SQUARE up into the Logo editor with the command TO SQUARE or EDIT "SQUARE, depending on the version of Logo you use. You should see something similar to this on your screen:

```
TO SQUARE
FD 50 RT 90
FD 50 RT 90
FD 50 RT 90
FD 50 RT 90
END
OR,
TO SQUARE
REPEAT 4(FD 50 RT 90)
END
```

The SQUARE procedure, as shown above, tells the turtle to draw a square with sides 50 turtle steps long. What if, instead, you want the turtle to draw squares 30 or 75 turtle steps on a side? One solution might be to define a new procedure for each size of square, one containing the command FD 30, the other, FD 75. Eventually you might define a whole collection of SQUARE procedures, each differing from the others only in the value of the constant that tells the turtle how long the sides of the square should be.

Variables offer another solution to this problem. Let's edit the SQUARE procedure above, replacing the number 50, wherever it occurs, with the expression :SIDE and adding the same expression to the procedure title:

```
TO SQUARE :SIDE
FD :SIDE RT 90
FD :SIDE RT 90
FD :SIDE RT 90
FD :SIDE RT 90
END
OR,
TO SQUARE :SIDE
REPEAT 4(FD :SIDE RT 90)
END
```

:SIDE is a variable, a name that can stand for any value we want. By substituting :SIDE for a constant in the body of the procedure, we have told FD to use :SIDE's value as input, instead of a regular number. By placing :SIDE in the procedure title, we

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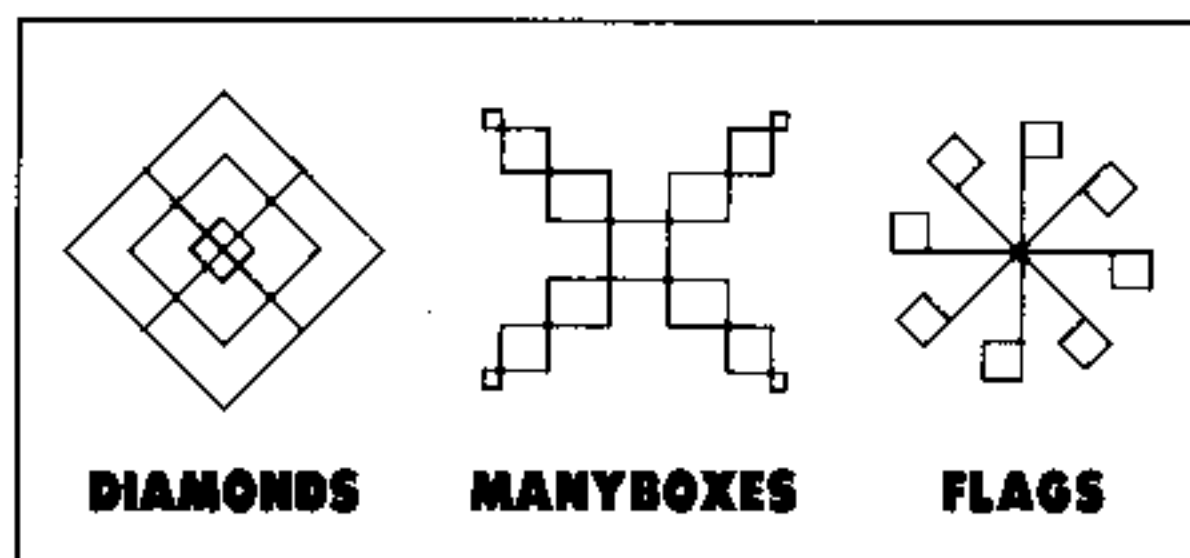
LEARNING LOGO

are telling SQUARE that it should expect to be given a value for :SIDE each time the procedure is executed.

What have we accomplished? Now SQUARE will respond to any number input we choose to give it, drawing a square with that number of turtle steps on a side. For example, if you execute SQUARE 10, the computer will substitute the value 10 wherever :SIDE appears in the body of the procedure, and draw a square with sides 10 turtle steps long. Try it. Now try SQUARE 20, then SQUARE 30.

The name we have chosen for our variable is arbitrary. We could have called it :LENGTH or :NUMBER OF :S. Logo will accept almost any group of characters preceded by a colon as a variable name. It's important that the variable name be written exactly the same both in the title of the procedure and within it.

Using your new SQUARE procedure as a subprocedure, see if you can write new procedures which draw these graphics:



Remember that SQUARE now expects to be given a number as input each time it is executed. What happens if you enter SQUARE alone?

MORE THAN ONE VARIABLE

Procedures can also be written using more than one variable. Just choose a name for each variable you need and include it in the title line. (Remember: A variable name *must* begin with a ":".) For example, the following procedure uses two input values to draw rectangles of varying sizes and shapes:

```
TO REC :HEIGHT :LENGTH
  FD :HEIGHT RT 90
  FD :LENGTH RT 90
  FD :HEIGHT RT 90
  FD :LENGTH RT 90
END
```

Naturally, each time you execute REC, you'll have to provide values for :HEIGHT and :LENGTH. Try executing REC 100 10 to make a tall, thin rectangle. Try REC 10 100 for a short, squat one. See if you can figure out what REC 100 100 makes.

Variables can be used with any shape-making procedure you define. They can stand in for numeric inputs to any Logo command that ex-

THE FAMILY CHALLENGE

This month's "Family Challenge" puts together a little bit of everything we've introduced: variables, setting the turtle's position, and printing things on the screen. Let's see if your family can recreate yourselves as snow people. Each family member can create a procedure that draws his or her counterpart. Then together, you can all write a final procedure that combines all the snow figures.

Since the circles that make up the various parts of a snow person's body are different sizes, the first challenge is to define a procedure that uses a variable to create the different circles needed. Each family member can use the same procedure, but change the variable input to suit their own size in relation to the others.

SETXY (or SETPOS) can be used when putting all of the separate family member's subprocedures together, to place each snow person in an appropriate location on the screen.

As a final touch, use the PR statement to add the names of all the family members to your picture.

pects a number or numbers. The following procedure uses three variables in conjunction with a variety of commands. Supplied with the proper inputs for number of sides, turtle turns in each angle, and length of each side, it can draw any regular polygon in any size you like!

```
TO ANYPOLY :SIDES :ANGLE :LENGTH
  REPEAT :SIDES(FD :LENGTH RT :ANGLE)
END
```

Try executing ANYPOLY 3 120 50 for a triangle. (See Logo No. 4, in the December issue, for a review of procedures that generate polygons.)

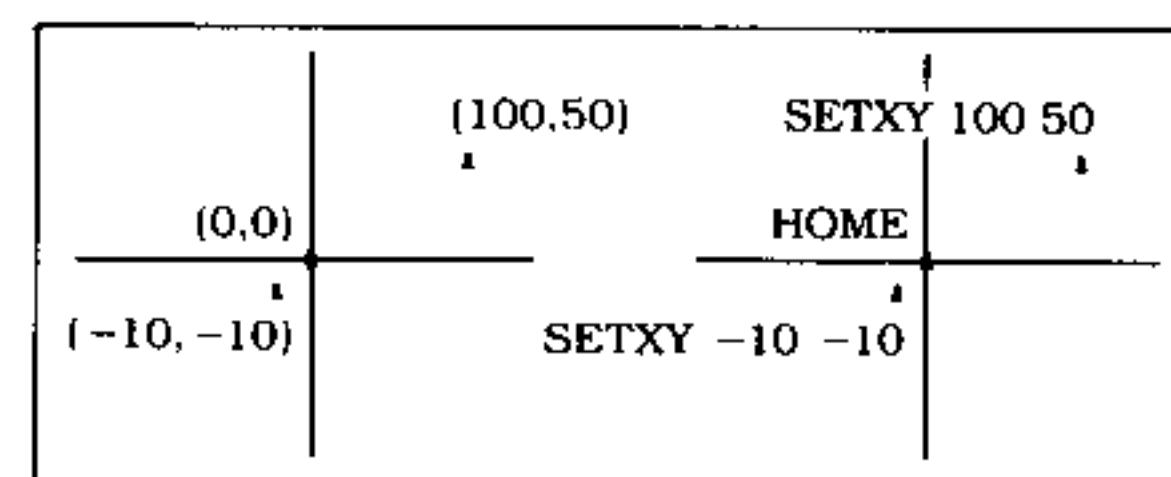
NOW—SOME NEW VOCABULARY

The more you know of Logo, the easier it is to express yourself. Here are some more Logo commands to add to your vocabulary.

SETXY. The command SETXY (or SETPOS, depending on your Logo version) is used to place the turtle in a specific spot on the screen other than HOME. It can be especially helpful when you want the turtle to make a shape in a particular place.

SETXY is always used with a pair of inputs representing the X and Y coordinates of the place you want the turtle to go, figuring the HOME posi-

tion as 0,0. For example, SETXY 100 50 places the turtle 100 steps to the right of the HOME position and 50 steps up. SETXY -10 -10 puts the turtle 10 steps to the left of the center of the screen and 10 steps down. (Note: the SETPOS version of this command requires the user to place the X and Y values in brackets, like this: SETPOS [100 50]. Try SETXY (or SETPOS) with some coordinate pairs of your own. Notice that if the turtle's pen is down, SETXY will cause a line to be drawn between the turtle's old position and its new one. What command could you use, prior to SETXY, to prevent this?



One caution when using SETXY with youngsters: most don't know what negative numbers are. Often they'll need a little help from parents to understand what an X,Y axis is all about, as well. Use the turtle to demonstrate, perhaps taping an axis made of crossed strings to the screen, centered over the HOME position. This can serve as an aid to visualizing how different X and Y values make the turtle move around.

HT and ST. These two commands stand for HIDE TURTLE and SHOW TURTLE. HT is used when you want to make the turtle disappear while still drawing on the screen. When the turtle is hidden, the execution of a drawing is generally speeded up. In addition, this command keeps the turtle from being a distraction while drawing. The ST command is used to make the turtle visible again.

PRINT. PR for short, the PRINT command directs Logo to print its input on the screen. Among other things, inputs to PRINT can be a list of words (a Logo list is any group of words or characters enclosed in square brackets, []). For instance, you might be able to guess what message PRINT [TRY THE FAMILY CHALLENGE.] prints on the screen.

MOVING ON

Next month we'll conclude our step-by-step look at Logo. Our last article will include a brief look at some advanced features of the language. We'll also discuss some special applications of Logo for very young children. Now, give this month's "Family Challenge" a try. ☐

HOME FINANCE SOFTWARE

TITLE/PRICE REQUIREMENTS	MANUFACTURER	HARDWARE	TYPE	SA	TD
Basic Accounting \$89	Firefighter Software (800) 641-0814	Apple II/II plus/IIe. 48K (disk).	C B	Y	Y
Cash Budget Management \$49.95	Radio Shack (817) 338-2395	TRS-80 CoCo. 16K (disk).	C B	Y	N
Certified Personal Accountant \$149.95	Sundex Software Corp. (303) 440-3600	Apple II series, 64K (disk); IBM PC/PCjr, 128K (disk).	C B	Y	Y
Checkbook \$29.95	Batteries Included (714) 979-0921	Commodore 64 (disk).	C	Y	Y
Checkbook Manager \$9.95	Triton Products Co. (800) 227-6900	TI-99/4A, 32K (disk).	C	N	N
Checks & Balances \$74.95	CDE Software (213) 661-2031	IBM PC/PCjr, 196K (disk).	C B	N	Y
Chequemate Plus \$79.95 (Apple); \$149.95 (PC)	Masterworks Software, Inc. (213) 539-7486	Apple II/II plus/IIe. 48K (disk); IBM PC, 64K (w/DOS 1.0, 1.1, otherwise needs 128K). (disk).	C B	N	Y
Complete Personal Accountant \$79.95	Futurehouse (919) 967-0861	Atari Home Computers, 48K (disk), translator required for XL series; Commodore 64 (disk); TRS-80 CoCo, 32K (disk); versions planned for Apple, IBM.	C B	N	Y
Dollars and Sense \$99 (Apple II plus/IIe); \$119 (IIc); \$149 (Mac); \$165 (IBM PC); \$179 (IBM PC/PCjr w/Forecast)	Monogram (213) 215-0529	Apple II/II plus/IIe. 48K (disk)/IIc, 128K (disk)/Macintosh (disk); IBM PC, 64K/PCjr, 128K (disk).	C B PV/FV	Y	Y
Dow Jones Home Budget	Dow Jones Co., Inc. (609) 452-2000	IBM PC, 128K (disk).	C B	Y	Y
Easy Finance I-V \$21.95 each	Commodore (215) 431-9100	Commodore 64 (disk).	F Loans, PV/FV, annuities, stock values	Y	N
Electronic Checkbook \$29.95 (C 64); \$69.95 (IBM)	Timeworks, Inc (312) 948-9200	Commodore 64 (disk); IBM PC/PCjr, 128K (disk).	C	Y	Y
Family Budget \$34.95	Dynacomp (716) 671-6160	Apple II series, 32K (disk); Atari Home Computers, 32K (disk); TRS-80 I/III/4, 16K (disk).	B	Y	N
Finance Manager \$99.95 (Apple); \$139.95 (IBM)	HesWare (415) 468-4111	Apple II series, 48K (disk); IBM PC, 128K (disk).	C, B Loans, PV/FV, interest rates	N	Y
Financial Cookbook \$50	Electronic Arts (415) 571-7171	Apple II series, 48K (disk); Atari Home Computers, 48K (disk); C 64 (disk); IBM PC/PCjr, 64K (disk).	F PV/FV	N/A	Y
Home Accountant Plus \$150	Arrays, Inc./Continental Software (213) 410-3977	IBM PC, 128K (disk).	C, B FV, savings	Y	Y
Home Accounting \$39.95	TOTL Software, Inc. (206) 468-2214	Commodore 64 (disk).	C, B Loans	N	Y
Home Financial Decisions \$5.95	Triton Products Co. (800) 227-6900	TI-99/4A, 16K (cartridge).	F Loans	N/A	N/A
Home Management Six-Pack \$79.95	Our OwnWare (215) 331-7900	Apple II series, 48K (disk).	F Loans, PV/FV, IRA	N	N/A
Household Budget Management \$5.95	Triton Products Co. (800) 227-6900	TI-99/4A, 16K (cartridge; needs disk or cassette system).	B	Y	N
J.K. Lasser's Your Personal Money Manager \$79.95	Simon & Schuster (212) 245-6400	Apple II series, 128K (disk); IBM PC/PCjr, 128K (disk).	C B	Y	Y
Managing Your Money \$199.95	MECA (203) 222-1000	IBM PC, 128K/PCjr, 256K (disk); (IBM PCjr cartridge, 128K, available through IBM).	C, B, F	Y	Y
Money Manager \$24.95 (C 64); \$59.95 (IBM)	Timeworks, Inc. (312) 948-9200	Commodore 64 (disk); IBM PC/PCjr, 128K (disk).	B	Y	N
Peachtree Home Accountant \$140	Peachtree Software (800) 247-3224	IBM PC/PCjr, 128K (disk).	C, B Loans FV/PV	Y	Y
Personal Accountant \$29.95 (C 64, cassette); \$34.95 (C 64, disk; Atari); \$49.95 (Apple); \$89.95 (IBM; Mac)	Softsync, Inc. (212) 685-2080	Apple IIe/IIc, 64K (disk)/Macintosh (hard disk); Atari Home Computers, 48K (disk); Commodore 64 (disk & cassette); IBM PC/PCjr, 128K (disk).	C B (IBM, Mac) Loans, FV/PV	Y	Y (Mac)
Personal Finance System \$39.95; \$42.95 (double density)	Dynacomp (716) 671-6160	Apple II series, 32K (disk); Atari Home Computers, 32K (disk); Commodore 64 (disk); IBM PC/PCjr, 64K (disk); TRS-80 I/III/4, 16K (disk).	C	N	Y
Quicken \$99	Intuit (415) 322-0574	IBM PC/PCjr, 192K (disk).	C B	Y	Y
Time Is Money \$100	Turning Point Software (617) 923-4441	Apple II series, 48K (disk). Version planned for IBM PC/PCjr.	C B	N	Y
Women's Ware: Budget \$49.95	Neon Software (203) 346-6322	IBM PC/PCjr, 128K (disk), (IBM PC requires color graphics board).	B	Y	Y
Women's Ware: Checkbook \$49.95	Neon Software (203) 346-6322	IBM PC/PCjr, 128K (disk)	C	N	Y
Your Personal Net Worth \$79.95 (Atari; C 64); \$99.95 (Apple; IBM PC)	Scarborough Systems (914) 332-4545	Apple II series, 48K (disk); Atari Home Computers, 48K (disk); Commodore 64 (disk); IBM PC/PCjr, 128K (disk).	F	Y	Y

CP	AUTO	COMMENTS
Y	Y	Hard to set up, but *** documentation provides guidance. Full-service accounting program.
N	N	Easy to use, with good sorting features. *** documentation.
Y	Y	Full-service accounting program with net-worth report and stock-portfolio monitor.
N	Y	Simple command menu makes it easy to use.
N	N	Easy-to-use checkbook program.
Y	Y	Documentation is too technical—written from a programmer's point of view.
Y	N	Basic checkbook/budget program.
Y	Y	Full-service accounting program includes mailing list and appointment calendar.
Y	Y	Checkbook/budget functions can be supplemented with extensive tax-planning program (IBM PC/PCjr). Also permits stock-portfolio management.
Y	N	Full-service accounting program. Experienced user can save time by switching off prompts for data entry.
N/A	N/A	Disk I handles calculations; II calculates PV/FV, stock values, rate of return on investments; III-V are for business use. Programs include built-in calculator and helpful glossary. Useful for comparing alternative scenarios without repetitive data entry.
N	N	Easy to use.
N	N	Limited home-budget program also keeps charge-account records.
Y	Y	Good on-screen help guides user through data entry.
N/A	N/A	Easy to use. Offers 30 "recipes" for financial calculations. Beware of hidden assumptions that may distort results.
Y	Y	Full-service budget program, but minimal financial counseling. Tedious setup common to this type of program. Runs faster (on hard disk) than earlier version. *** documentation.
N	N	Easy-to-use graphic display. **** documentation.
N/A	N/A	Full range of financial-counseling features: rent vs. buy for home, PV/FV, loan & savings calculations. Uses sophisticated financial methods with hidden assumptions. *** documentation.
N/A	N/A	No manual—all instructions and HELP appear on-screen. Calculates PV by asking for your estimate of inflation. Also includes telephone directory, inventory of personal property and credit cards, etc.
N/A	N/A	Features good graphic displays of budget vs. actual expenses.
N	Y	Not available for review at press time.
Y	Y	Complete program with powerful tax planner. Built-in calculator. Reads data already entered into other parts of program. Complete on-screen help. Good stock-portfolio monitor.
N/A	N/A	Enters figure in whole dollars only. Includes graphic display. Works with <i>Electronic Checkbook</i> .
Y	N	Easy to get net-worth statement.
N	N	Keeps home balance sheet based on accounting principles. Includes name/address data-base manager.
N	N	Very simple checkbook program.
Y	Y	Easy-to-use program set up like a checkbook.
Y	Y	Powerful home-budget/checkbook program.
N	N	Easy to boot and operate. **** documentation, but condescending.
N	N	Same as above.
Y	N/A	Excellent on-screen help. Easy data entry includes stock portfolio. Useful inquiry key lets user access index of budget categories.

NOTES TO THE CHART:

Type: C = Checkbook programs; B = Budget programs; F = Financial-counseling programs that perform a variety of calculations: loan analysis, savings-account interest, buy vs. rent decisions, etc.; PV/FV = Present-value/future-value calculations performed. (Present-value calculations help you compare financial alternatives. Future-value calculations help you figure out what you might earn in a situation in which interest is accrued.)

SA: Furnishes sample accounts.

TD: Identifies tax-deductible items.

CP: Prints checks, usually on preprinted forms.

AUTO: Processes recurring transactions automatically.

Key: Y = Has feature; N = Does not have feature; N/A = Feature not applicable.

Documentation: **** = Excellent; *** = Very good. All other documentation is adequate unless otherwise noted.

which choice is preferable: buying vs. renting a home, for instance. Present value illustrates the financial truth that it's better to have a dollar today than the same dollar a year from now—because you can invest the \$1 today in a savings account and, with interest, earn 5–10 cents more after a year. Likewise, it's always cheaper to make a \$1 payment a year from now than today.

Present value comparisons are used on any scenario that stretches into the future. But the program must ask the user to supply an appropriate interest rate to determine exactly how much greater (or smaller) that dollar will be after several years. An unknowing user might skip right over a question asking for the interest rate on a savings account while figuring a loan scenario. That mistake might make a very costly decision look overly inviting.

THE TAX BRACKET TRAP

Similarly, programs that calculate your tax savings must take your marginal tax bracket into account. People frequently confuse tax bracket with tax rate. Your marginal tax bracket is the rate at which the next dollar you earn over and above your present income will be taxed. This bracket is always higher than your tax rate, which is the percent of income you pay in taxes.

Your bracket determines how much a given tax deduction actually saves in taxes, as well as the tax you'd owe on savings interest. If you're hasty in figuring your bracket—or simply don't know what it is and leave the item blank—you'll seriously distort the final results. *Financial Cookbook* provides two helpful features on this score: It tells you all about tax brackets, and its profile utility remembers the numbers you've entered and applies them to other scenarios.

WHAT SOME FAMILIES SAY

Regardless of how good the package you get your hands on is, be prepared to spend some time computerizing your family finances. Budgeting and balancing require a discipline both on and off the computer, as these FAMILY COMPUTING reviewers discovered. Concentration and commitment are the main ingredients for the successful application of a computer to a financial situation. You've heard what the financier says about home-finance software. Here's what some families say.

ROBIN RASKIN:

I've made the plunge and I'm glad I did. When I first sat down at the computer with my pile of manila envelopes and receipts, I was tempted to stay with my tried-and-true "pencil-and-paper storage system." Sundex's *Certified Personal Accountant* helped ease the transition.

It was the on-screen tutorial that got me up and running in the first place. The only time I had to use the manual was to prepare my tax categories, and that's only because I'm ignorant of the fine distinctions between many financial terms.

I like CPA's overall strategy. You've got two big categories: accounts and budgeting. Accounts takes care of the big picture—my expenses and earnings, assets and liabilities. The budget helps me out in the shocking actualities—just how much I spent on groceries this month and how much more that figure is than what I'd planned.

The program's management of my accounts was more useful than the budgeting component. To make the budget work, you've got to type in a year's worth of estimated budgets for all categories. Trying to estimate my expenses for a year was a waste of time.

BETSY BYRNE:

Until *Your Personal Net Worth* came into our lives, our budget was nonexistent, and our financial planning reminiscent of the Stone Age. Needless to say, April 14 always found us burning the midnight oil, overwhelmed by piles of disorganized information. This year, we tried several programs before deciding on *Your Personal Net Worth*. Some were much too simple for our needs (we need to have categories for more than one source of income, for instance).

Others, we found almost incomprehensible to us nonaccountant types.

The excerpt from Sylvia Porter's book included in the *Net Worth* package made us realize that our biggest problem had been not understanding how to create a budget. It took a while to set up and organize our financial information (the computer can't take over that task), but now everything from Timmy and James' Cub Scout dues (\$1 per week) to credit card payments and utility bills (more than \$1 per week) is itemized each week—with a lot more money left over than we'd ever suspected.

Net Worth gives us a nice printout, and impresses the heck out of (as yet non-computer using) relatives! And, when my husband asks, "What on earth did you do with all that money I gave you last week?" I always have an answer.

JOHN LINCOLN:

Getting my personal income and expenses into a good computerized checkbook-management program was the first step in managing my family's finances. The second step was investing in *Financial Cookbook*.

The disk holds more than 30 different financial-analysis programs. They answer questions like "How much money should I be saving each month toward my son's education." My son is 10 years old, so I have eight years of saving ahead of me. I don't know what college will cost in 1992, but I can estimate that the "buying power" I want is about \$25,000 in today's dollars. Here's the way I fill in the screen:

THE BUYING POWER YOU WANT: \$25,000
NUMBER OF YEARS: 8
INFLATION RATE: 6%
INTEREST RATE EARNED: 8%
COMPOUNDING PERIOD (days): 365
MARGINAL TAX RATE: 20%

I hit the "compute" button and instantly the calculation appears:

MONTHLY DEPOSIT REQUIRED: \$318

The printout also contains a breakdown, year by year, of interest earned, taxes paid, cash balance, and actual buying power (cash balance adjusted for inflation).

Of course, in the case of my son and his tuition, the information *Cookbook* provides is only as good as the information put into it. Because the inflation rate will change over the next eight years, I'll be running regular updates on the tuition calculation.

Many programs provide a brief explanation of these difficult concepts in an accompanying manual. That's good enough for starters, but it doesn't help you avoid pitfalls in using the program. TI/Triton Product's *Home Financial Decisions* is more helpful: Its manual warns you about distortions that could enter into the pic-

ture. In a calculation on buying or renting a home, it even cautions against placing too high an expected resale value because the number "has a significant effect on final results."

You can solve this problem yourself. Simply experiment to discover which factors cause the biggest change in the total, and which ones hardly seem to matter. That way, you'll know what to watch for and when a program might lead you into ruin.

TIMES, THEY ARE A CHANGING

Don't assume that once you've initialized your data disk and installed your software your work is done. Change whips through the financial world with amazing speed. Few programs can keep up.

For instance, the single most confusing decision facing nearly every home buyer today is what kind of mortgage to take: fixed rate or one of the several different adjustable types. Yet none of the programs in our chart lets you make the necessary comparisons. A few give you the tools to figure it out for yourself, but so would a business-level pocket calculator. ARMs, as the adjustables are called, are simply too complex an innovation for most software companies to have included in the programs.

Some programs have clever ways to keep your software up-to-date. *Managing Your Money* offers a simple utility for do-it-yourself updating when tax laws change. It takes only a few simple keystrokes. This ingenious feature should be included in every program that relies on tax calculations. MECA will also distribute a newsletter mentioning changes in tax laws and tips written by the program's author, financial columnist Andrew Tobias, to all purchasers of the software who pay an extra fee.

Managing Your Money accurately bills itself as an "integrated home financial package." It might be considered a Cadillac among software of its type. It offers a full range of budget and counseling services, and makes it easy, and sometimes fun, to work through your financial chores.

Some families won't ever need some of its more advanced features. Remember that once you plug into a checkbook or home-budget program, you have to adhere to its intricate, electronic ways. Forget to enter several checks, or neglect to account for some expense, and those carefully balanced budget categories can go haywire. On the other hand, some of us yearn for help in organizing our finances. Imagine what you could do with an item-by-item printout of the family's living expenses—to help plan for the future, travel, or education; to make it easier to figure your taxes; or just to see where those hard-earned dollars go. You won't be enslaving yourself to an elaborate home-budget program, you'll use it as a tool for your financial emancipation.

First, you have to know what you want. Then, it's easy to narrow the choice of programs to one that will fit your needs. ☐

J BUYER'S GUIDE TO JOYSTICKS

IN THIS AGE OF FANCY COMPUTER DOODADS,
A GOOD, SOLID JOYSTICK CAN BE A USER'S BEST FRIEND

BY KEN COACH

Joysticks look pretty much alike. They all have two crucial parts: a handle and a fire button (or two or three). When you start to use joysticks, though, you realize that each one is as different as a fingerprint.

While joysticks are used as drawing tools in some graphics programs (see "Picture Perfect" in the December 1984 FAMILY COMPUTING), and as glorified cursor-control keys in some educational software, they are designed primarily for gaming. Joysticks, in fact, are great scapegoats when learning a new game. A good score can be attributed to skill, while a poor performance is obviously the joystick's fault. "This stupid joystick . . ." There's some truth behind this attitude—there are good and bad joysticks. But how can you tell the difference?

GETTING A GRIP ON JOYSTICKS

The problem is, beauty is often in the eye of the beholder. Different people look for different qualities in a joystick depending on the size of their hand, their hand-eye coordination, etc. Beyond that, different games respond better to joysticks than others, and some games respond better to certain joysticks. In other words, the type and quality of the software is often a factor.

Most joysticks are spring-loaded to make them spring back to the center when you take your hand away. For some games, such as *Flight Simulator*, or for some graphics programs, it's better to use a free-floating stick that doesn't automatically center. High-quality joysticks have a switch to let you choose between the self-centering and free-floating modes.

TWO TYPES

Another important factor to keep in mind is that there are two basic types of joysticks. Make sure you get one designed for your computer. Digital joysticks, often called "Atari-type," work with Atari, Coleco, and Commodore computers. Most can also be used with the Texas Instruments 99/4A, but require a plug-adaptor. And some are designed with a numeric keypad, specifically for the Coleco ADAM. These digital joysticks cannot directly control the speed of an object, and can move it in only eight

directions. They range in price from about \$10 to \$50.

Analog joysticks, which have much smaller shafts (or sticks), can control both the speed and position of an object for a full 360 degrees. These joysticks are used with the Apple, IBM, and TRS-80 Color Computer. Many analog joysticks can be calibrated to adjust the response of the stick to the user's particular style. They cost about \$50.

The best way to decide if a joystick is right for you is to plug it into your computer, boot up your favorite game, and spend an hour or two testing it out. That, of course, is not always possible, so our FAMILY COMPUTING "playtesters" have checked out a range of joysticks from leading manufacturers for comparison purposes. Refer to the chart first to see which joysticks work on your computer, then check our mini-reviews.

ATARI

Atari's original joystick is a classic, but the new ProLine is even better. It works on all Atari computers, and is smaller and more streamlined than the old Atari sticks. It's self-centering, and has fire buttons on the sides of the base. Our testers were impressed with the ProLine's response, and the placement of the fire buttons.

CHAMPIONSHIP ELECTRONICS

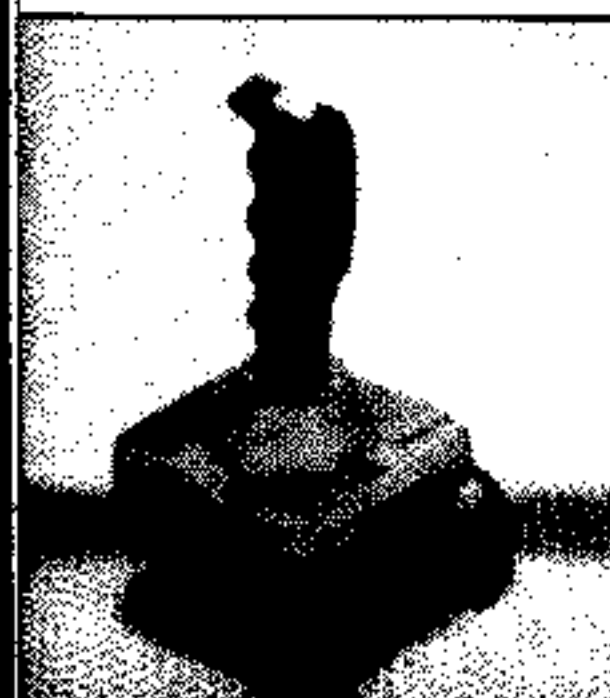
Championship Electronics has two joysticks, both with suction-cup bottoms for secure table-mounts, and retractable cables. The JC-250 Super Champ has a 10-foot cable that disappears into the base, while the JC-351 Mini Champ has a 4½-foot cable. Both sticks have a fire button on top of the stick. The Super Champ has a second one in the trigger position. The Mini Champ, which has a button on each side of the base, is not very sturdy.

COIN CONTROLS

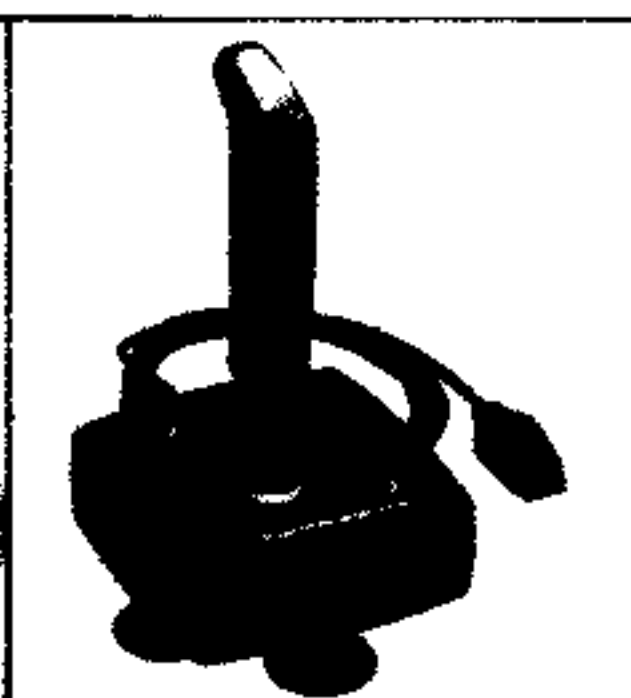
Coin Controls makes a series of joysticks under the Competition Pro label, ranging from the very low quality model 200X to the very high quality model 5000. All of the joysticks are of medium size, although the 200X and 1000 are slightly shorter. We tested models 3000 and 5000.

The 3000 has a wide fire bar instead of a button in front of the pistol-grip stick. There's also a trigger fire button, and another fire button on the top of the stick. Each of the three is always live.

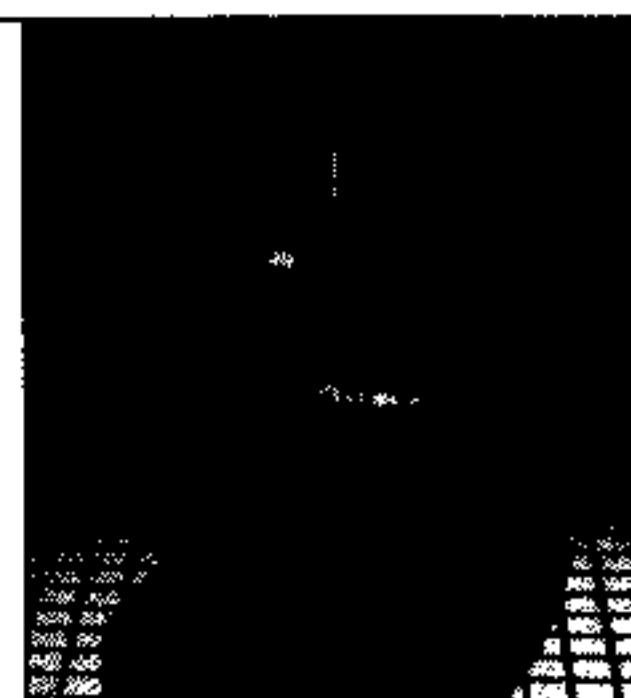
KEN COACH is a producer for the Canadian Broadcasting Co., and a freelance writer specializing in computer topics.



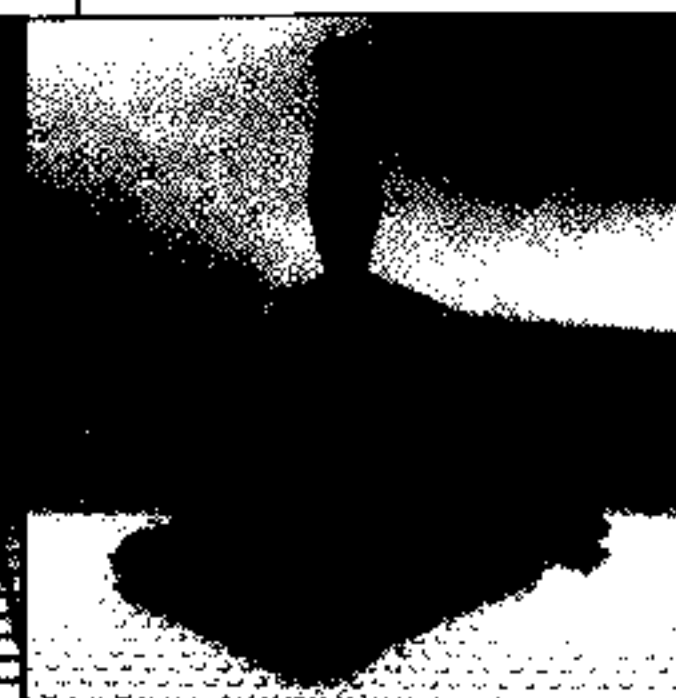
Wico's The Boss



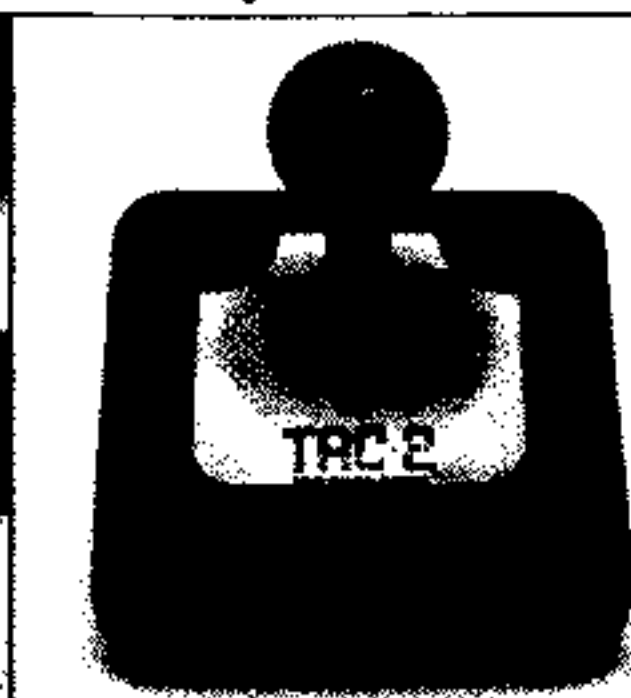
Discwasher PointMaster



Kraft Joystick (Atari)



Wico Command Control (Apple)



Sencom Tac-2



Sencom Tac-3

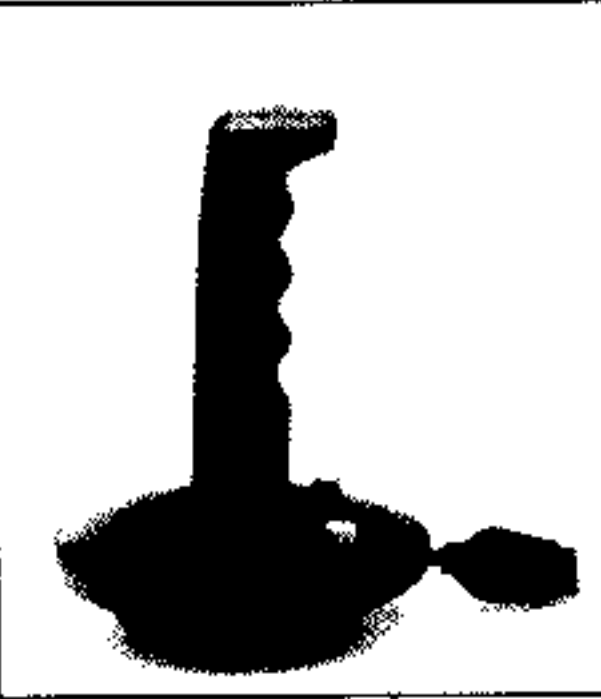
GUIDE TO JOYSTICKS

COMPANY	MODEL	PRICE	HANDLE SIZE	FIRE BUTTONS	COMPATIBILITY
Apple (408) 996-1010	Apple IIe Joystick	\$59.95	Small	Two, both on base	AP
Atari, Inc. (408) 745-2000	Atari Joystick	\$8.95	Medium	One, on base	AT/COM
	ProLine	\$19.95	Medium	Two, one on each side of base	AT/COM
	Space Age	\$14.95	Large	Trigger-type, with stick on top	AT/COM
Championship Electronics (415) 961-0664	JC-351 Mini Champ	\$9.99	Small pistol grip	Three, one on each side of base and on stick	AT/COM
	JC-250 Super Champ	\$12.99	Medium pistol grip	Two, one on top of stick and trigger	AT/COM
Coin Controls (800) 323-8174 or (312) 228-1810	Competition Pro Model 1000	\$12.95	Short	Bar on front of base	AT/COM
	Competition Pro Model 200X	\$8.95	Short	As above	AT/COM
	Competition Pro Model 3000	\$15.95-\$17.95	Medium pistol grip	Three, one on bar, top, and trigger	AT/COM, TI, COL
	Competition Pro Model 5000	\$17.95	Medium ball-top	Two, one on each side of base	AT/COM, TI, COL
Commodore, Inc. (215) 431-9100	VIC-20 Joystick	\$10	Small	Fire buttons One, on front of base	AT/COM
Discwasher (314) 449-0941	PointMaster	\$16.95	Large pistol	One, mounted on shaft	AT/COM
	PointMaster Pro	\$27.95	As above	As above	AT/COM
GIM Electronics (516) 741-3133	Fire Command	\$39.95	Medium, large base	Two, one on each side of stick	AT/COM, COL
	Fire Command	\$44.95	As above	Four, two on each side of stick	COM
	S-3000	\$49.95	Small	Two, on base	AP, IBM
IBM (800) 447-4700	IBM PCjr Attachable Joystick	\$40	Small	One, on base	IBM
Kraft (800) 854-1923	Joystick	\$12.95	Small	One, left side	AT/COM
	Switch Hitter	\$14.95	Small	Two, one on each side of base top	AT/COM
	Premium	\$49.95	Small	One, on left side	AP, IBM, TRS
Newport Controls (408) 358-3439	Prostick II	\$24.95	Medium ball-top	Two, one on each side of base front	AT/COM
	Prostick III	\$29.95	Medium ball-top	Two, one on each side of base front.	COL
	Prostick 2002	\$29.95	Medium ball-top	As above	TI
Personal Peripherals Inc. (214) 758-8874	Enjoystick	\$19.95	Small	Two, one on each side of base	AT/COM
	Joystick	\$44.95	Medium	Two, both on base top	AP, IBM
Pride Electronics (801) 298-1814	Power-Stick	\$8.95	Tiny	Two, on base	AT/COM
	Power-Stick	\$15.95	Tiny	As above	COL
Suncom (312) 459-8000	Slik Stik	\$7.99	Short	One, on left side of base top	AT/COM
	Starfighter	\$10.95	Medium	As above	AT/COM
	Tac-2	\$12.95	Medium ball-top	Two, one on each side of base	AT/COM
	Tac-3	\$14.95	As above	Three, two in front, one on top of handle	AT/COM
	Starfighter for Apple	\$49.95	Medium	Three, one each side of top, and one in front of base	AP
Tandy/Radio Shack (817) 338-2395	Radio Shack Deluxe Joystick	\$39.95	Medium	One, on base	TRS
	Radio Shack Joysticks	\$24.95/pair	Small	One, on base	TRS
Wico (800) 323-4041 or (312) 647-7500	Command Control Bat Handle	\$26.95	Large	Two, on base and on stick	AT/COM
	Command Control Super Three-Way	\$32.95	Medium (choice of three handles)	As above	AT/COM
	Command Control Joystick	\$31.95	Medium	Two, on either side of keypad	COL
	Computer Command	\$49.95	Medium	Two, on base	AP, IBM
	The Boss	\$17.95	Large pistol	Two, on base or top of stick	AT

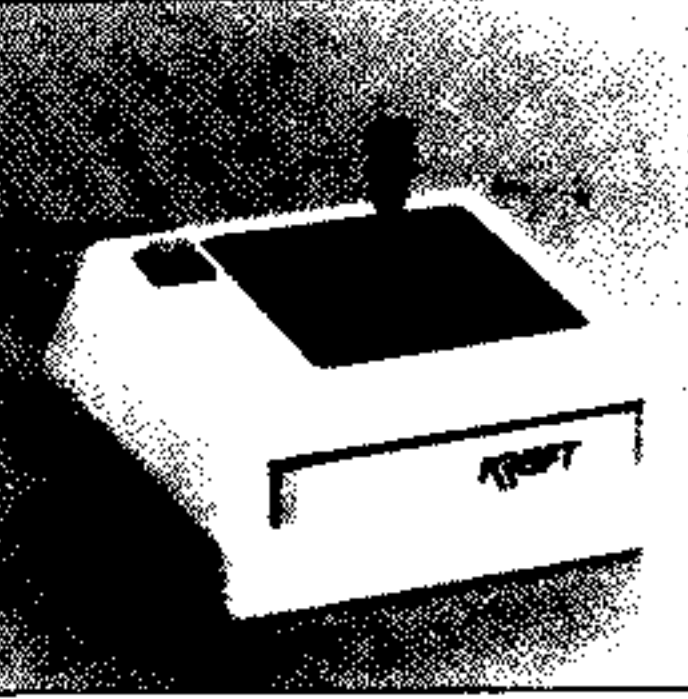
Joysticks marked AT/COM are compatible with Commodore and Atari computers and, in most cases, can be used with an adapter on the TI-99/4A. Joysticks for other computers are marked as follows: AP for Apple, COL for Coleco's ADAM, IBM for the PC and PCjr, TRS for TRS-80 Color Computer, and TI for the TI-99/4A if an adapter is not required.



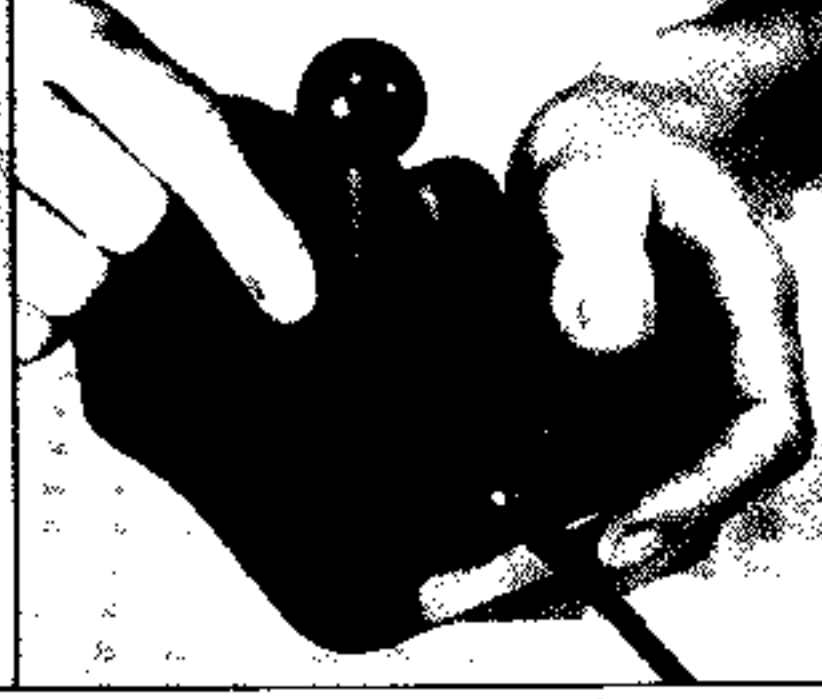
Competition Pro 5000



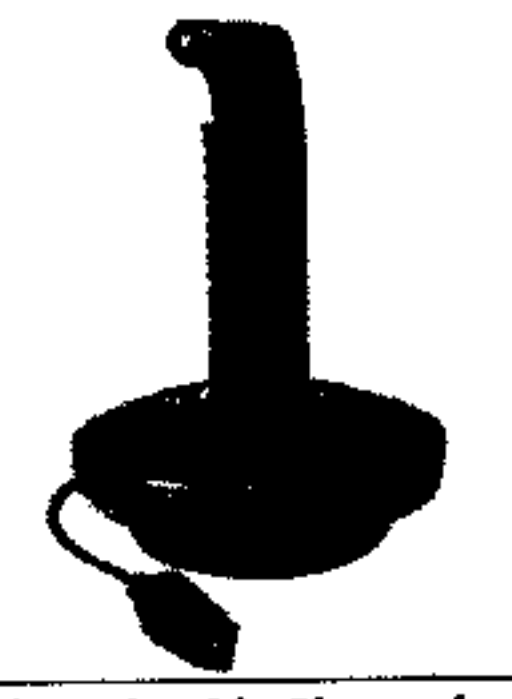
Championship Electronics Mini Champ



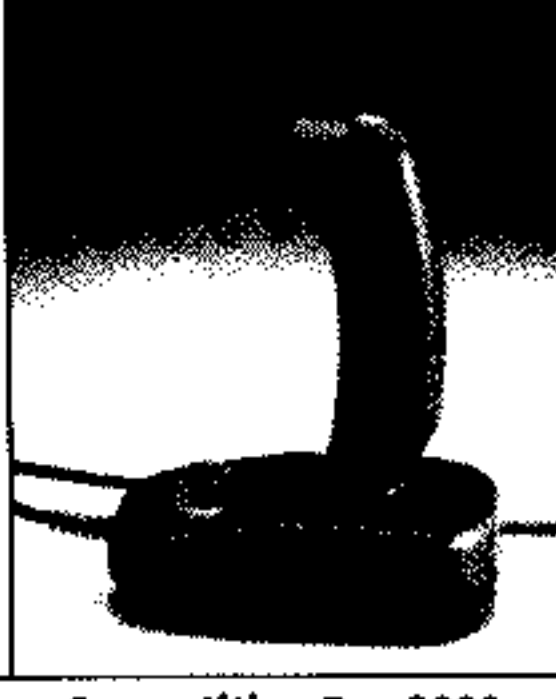
Kraft Premium Joystick



Newport Controls Prostick III



Championship Electronics Super Champ



Competition Pro 3000

The model 5000, which has a straight stick with a ball-top for a grip, and two fire buttons on the base, received raves from our testers. Everyone found it sturdy, with a "good feel." It responded well, and rested comfortably in the hand.

DISCWASHER

The PointMaster series from Discwasher has two models: the basic model and the Pro, which has suction cups to hold it on a tabletop, and a feature called "constant fire." By holding down the button, you can fire continually. Despite this nifty feature, however, the PointMaster sticks did not rate too highly with our testers, who thought they had a "flimsy" quality.

GIM ELECTRONICS

GIM's Fire Command probably comes the closest of any joystick reviewed here to capturing the feel of an arcade stick. It's almost a foot wide and weighs 5 pounds, making it far heavier than any other controller for the home market. It sits firmly on a table, or squarely on your lap, and allows you to use two hands without worrying about losing control of the joystick. Both the stick and the base are of extremely rugged construction.

Our testers liked this joystick and agreed it lent an arcade feel to a living room. But they also thought it was not quite as responsive as some of the other sticks, and that the fire button was sometimes slow on the draw.

JOYSTICK BUYING TIPS

1. Make sure the joystick is designed for your computer. If it's an Atari-type joystick and you have a TI, ask for an adapter plug.
2. Pick up the joystick and decide if it feels comfortable in your hand. Remember that you might spend an hour or two at a time in heavy combat! An uncomfortable stick will cause your hand to tire. Stiffer sticks especially tend to cause fatigue, because they force the hand holding the shaft to fight the hand holding the joystick base.
3. Check the fire button(s). Are they in convenient spots for your gaming style? Is there a trigger on the shaft, atop the stick, or on the base? Or does it have a combination? A nice (and rare) combination is a triggerlike button on the shaft for the thumb, and one on top for the forefinger. If you're left-handed, make sure the fire button allows easy access for southpaws, too.
4. Check the quality of construction. Does the joystick look and feel strong enough to fire repeated broadsides at enemy invaders? Some people like suction cups that hold a stick on a table, but most seem to prefer holding the joystick in their hands.
5. Plug in the joystick for a road test. Do movements on the screen occur as soon as you move the stick, or is there a lag? Is the fire button quick or slow? One good way to test a joystick is to play a game you're very good at on the beginner's level. If you miss a shot then it's more likely the joystick's fault than yours.
6. Does the joystick have a free-floating option or is it only spring-loaded (self-centering)? Drawing (with a graphics program) and some game-playing is easier with a stick that does not always spring back to the center.

KRAFT

Kraft joysticks are small and neat, and known for their "precision feel." The Atari-type model is adequate, though Kraft is better known for its deluxe sticks—the Kraft Premium line available for Apple, IBM, and TRS-80 CoCo. Kraft also sells an adapter for the TI-99/4A.

The Premium Joystick allows you to set each axis independently—in free-floating or spring-centering mode. Small calibration controls allow you to align the stick accurately with cursor position. With these features, the joystick is good for both drawing or gaming, and can be adjusted to suit the user.

NEWPORT CONTROLS

The Prostick line from Newport Controls features left- and right-side fire buttons, and an option that blocks the stick from making diagonal movements. This feature is helpful in right-angle maze games, such as *Pac-Man*.

The Prostick is a sturdy, dependable product that received high marks from our testers. It was the favorite stick for a fast-moving game of *Archon* or *Boulder Dash*. But, some users might find the joystick's feel too "stiff" or hard on the hands, especially those who get excited in the heat of a game. Overall, though, the Prostick is a responsive joystick that fires well.

PRIDE ELECTRONICS

The Power-Stick, formerly marketed by Amiga, is the smallest joystick on the market. It's so tiny you can use it with one hand, moving the shaft with your thumb. Two-handed use is also possible, of course, and the Power-Stick has buttons for either right- or left-handed play.


The Power-Stick allows for precise movements and responds well in delicate maze-type games. Its "dainty" feel also works well with some shoot-em-ups, though in games requiring bold action, such as *Boulder Dash*, our testers sometimes found the small shaft a liability.

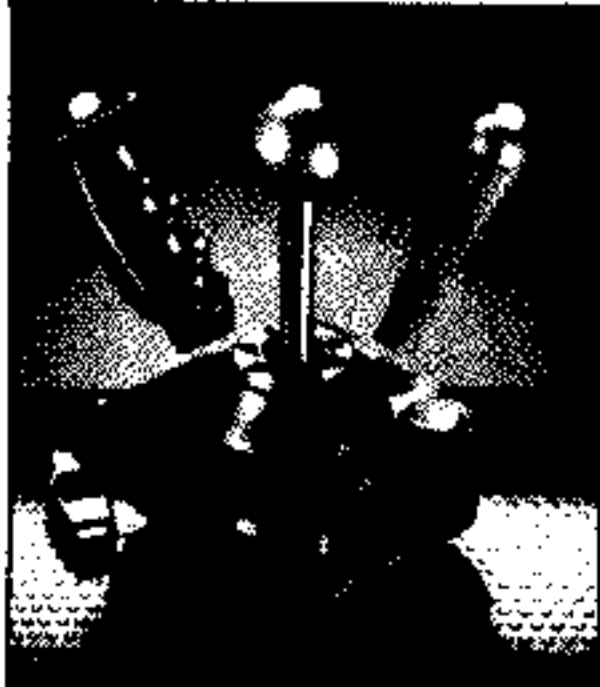
SUNCOM

Suncom makes four different Atari-type joystick models, and one for the Apple. In design, all models have small, compact bases much like the Kraft sticks, but larger handles that are easier to grip. From the Slik Stik (\$7.99) on up to the Starfighter (\$49.95), all models have a reputation for "good handling." The Slik Stik will break down with heavy playing, but with such a low price it's a great deal while it lasts. The Starfighter for Apple affords excellent control and has a nice feel.

WICO

Wico, which makes several joysticks that work with a wide range of computers, has built a strong reputation for quality and durability. The Boss, a basic Atari-type stick, costs somewhat more than similar sticks from other manufacturers (\$17.95); but has an arcade-size pistol grip shaft, and is of rugged construction. Testers liked the choice of a fire button on top of the stick or on the base.

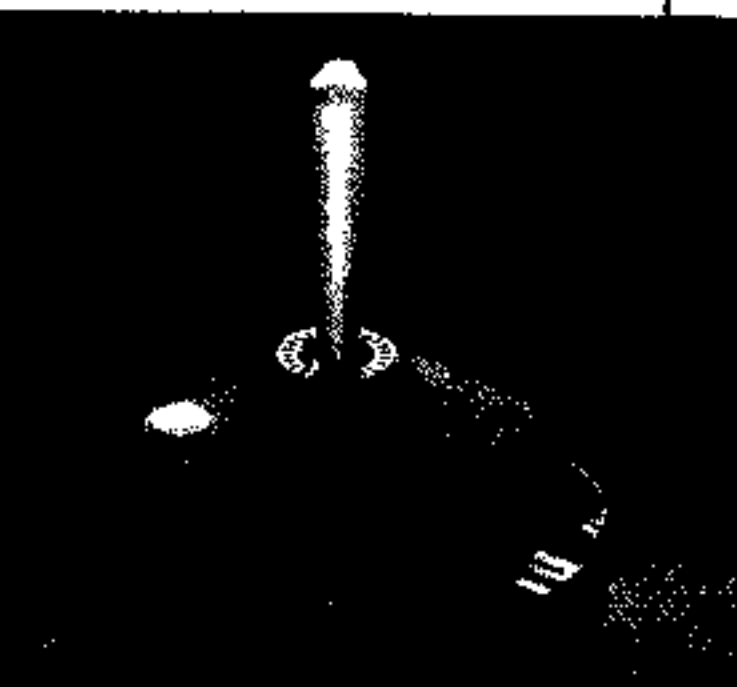
The Command Control model is available in bat-shaped-handle, a ball-top-handle, and pistol-grip models. There is also a combination model that allows you to choose from all three. All Command Control joysticks have two fire buttons, one on the base and one on the stick. 



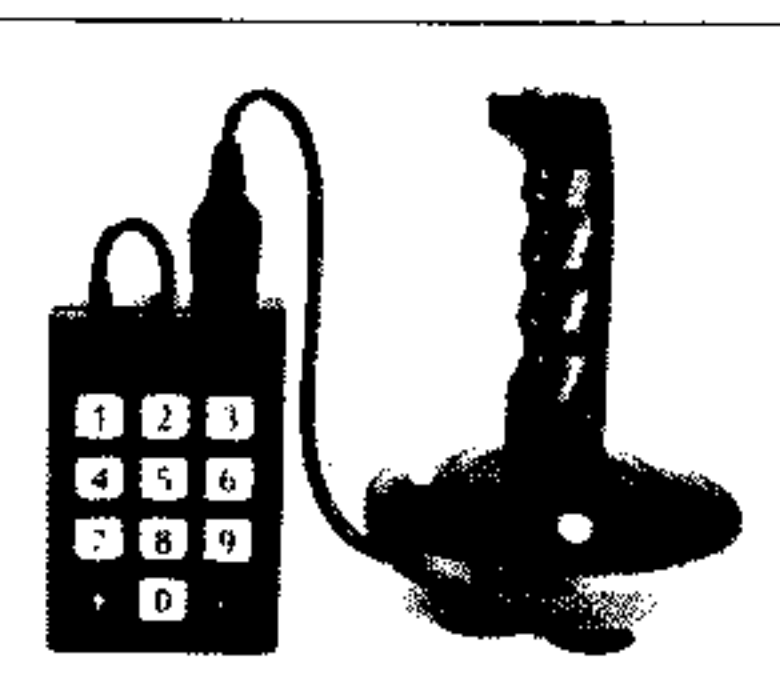
Wico Super
Three-Way Joystick



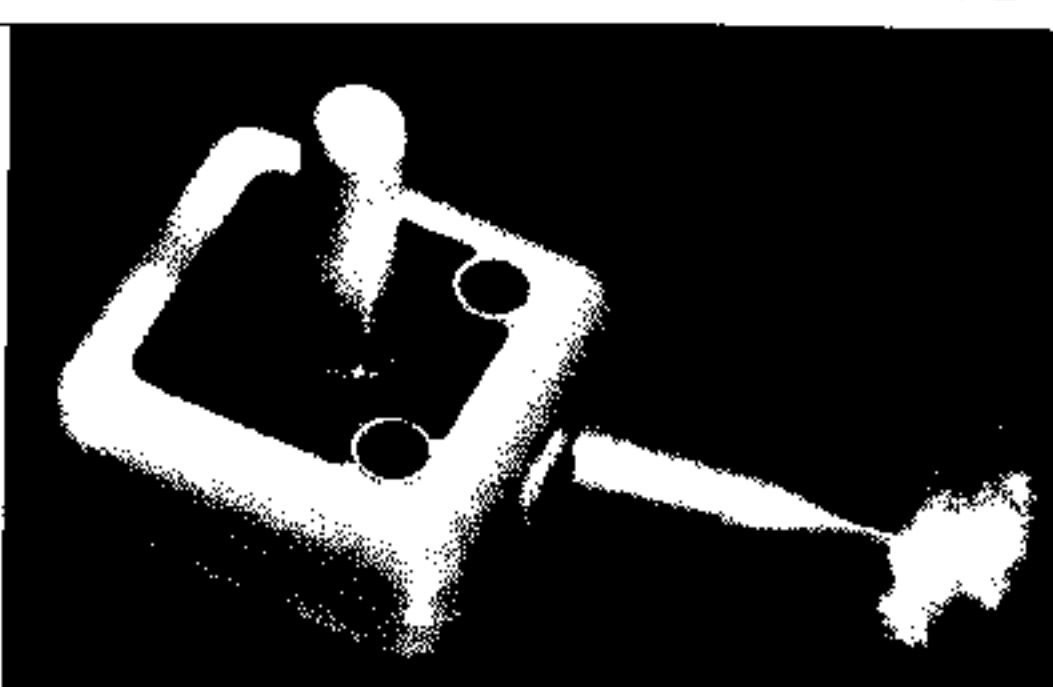
Suncom Slik Stik



Wico Command Control
Bat Handle (Atari)



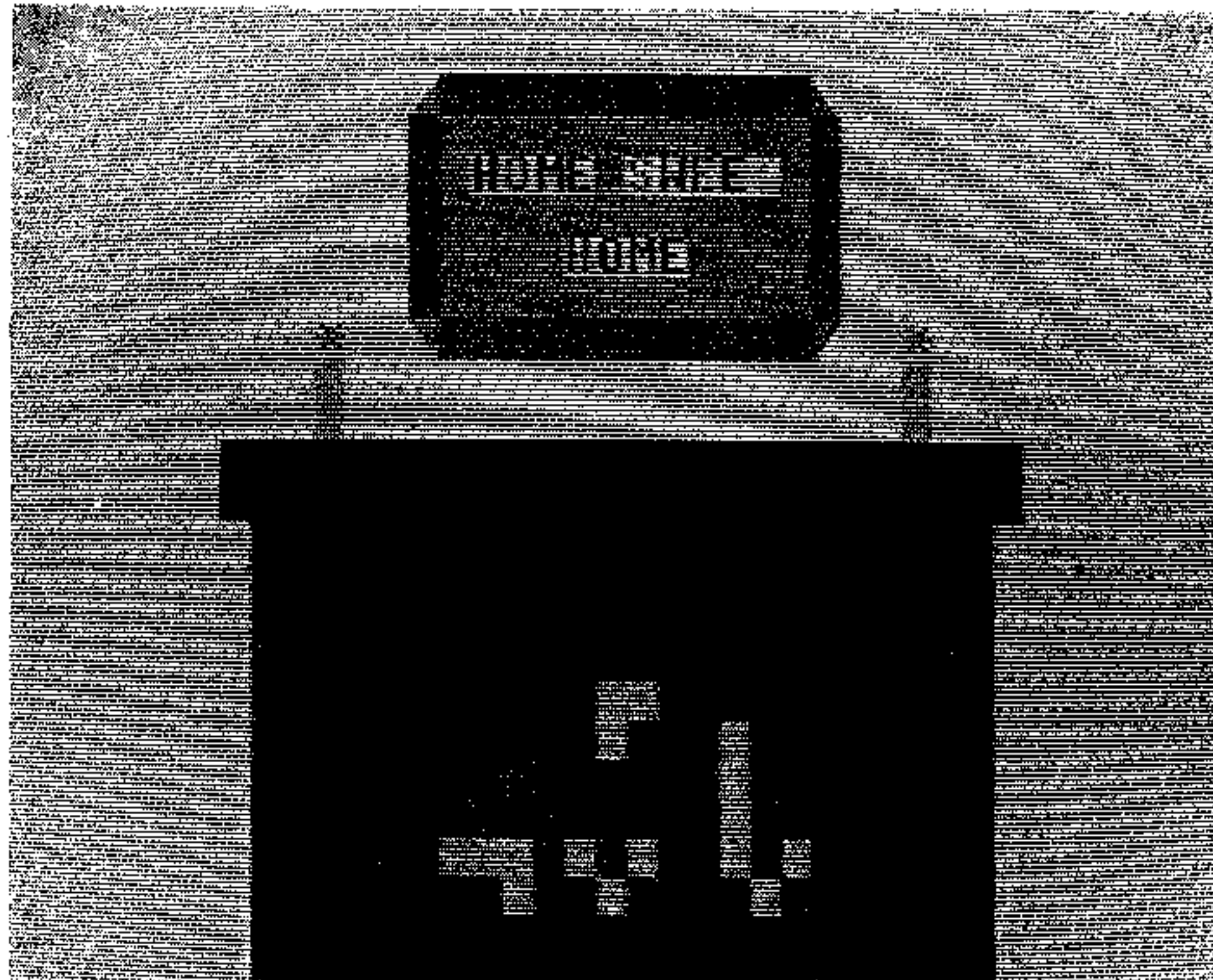
Championship Electronics
Champstick (Coleco)



Suncom Starfighter

FIREPLACE

BY JOEY LATIMER



There's nothing nicer than curling up in front of a fire on a cold winter night. Now, with the help of your computer, some of the old-

time fun of a roaring fire can be yours. Just type in our *Fireplace* program and gather 'round the cheery screen!

ADAM & Apple/Fireplace

```

10 DIM C(5)
20 HOME
30 GR
39 REM --READ FIRE COLORS INTO ARRAY C--
40 FOR X = 1 TO 5
50 READ C(X)
60 NEXT X
69 REM --DRAW BROAD AREAS OF PICTURE--
70 FOR X = 1 TO 14
80 READ KO,A,B,C,D
90 COLOR= KO
100 FOR RO = A TO B
110 HLIN C,D AT RO
120 NEXT RO,X
129 REM --DRAW DETAILS OF PICTURE--
130 FOR X = 1 TO 13
140 READ KO,CO,RO
150 COLOR= KO
160 PLOT CO,RO
170 NEXT X
179 REM --SET LOCATION AND LENGTH OF A FLAME--
180 CO = RND(1)*10+15
190 RO = 2*RND(1)*(5-(19-CO))*(CO < 19)-(CO-21)*(CO > 21)
199 REM --COLOR AND DRAW THE FLAME--
200 FOR X = 37 TO 37-RO STEP -1
210 COLOR= C(RND(1)*5+1)
220 PLOT CO,X
230 NEXT X
239 REM --COLOR AND DRAW CANDLE FLAMES--
240 COLOR= C(RND(1)*3+1)
250 PLOT 10,10
260 COLOR= C(RND(1)*2+1)
270 PLOT 29,10
280 GOTO 180
999 REM --FLAME COLOR DATA--
1000 DATA 13,9,13,9,1
1999 REM --DRAWING DATA--
2000 DATA 8,16,18,6,33,8,19,39,8,31,5,27,39,13
2010 DATA 26,3,12,15,10,10,3,12,15,29,29,5,1,13
2020 DATA 13,26,6,2,7,14,25,12,8,12,14,25,14,7

```

```

2030 DATA 10,17,21,0,6,6,16,22,0,5,5,17,21,0,4
2040 DATA 4,18,20,0,3,3,19,19,0,38,38,15,24,0
2050 DATA 14,37,0,16,39,0,23,39,0,25,37,13,18,7
2060 DATA 13,20,7,8,19,10,8,19,9,13,24,2,13,25
2070 DATA 2,13,25,3,1,17,3,1,17,4

```

Atari/Fireplace

```

9 REM --RESERVE MEMORY FOR NEW CHARACTER SET--
10 S=(PEEK(106)-4)*256
20 POKE 106,S/256
30 GRAPHICS 1+16
39 REM --TRANSFER CHARACTERS IN "HOME SWEET HOME"--
40 FOR X=1 TO 7
50 READ CH
60 FOR Y=CH*8 TO CH*8+7
70 POKE S+Y,PEEK(57344+Y)
80 NEXT Y
90 NEXT X
99 REM --REDEFINE CHARACTERS !, ", #, AND $--
100 FOR X=8 TO 39
110 READ A
120 POKE S+X,A
130 NEXT X
139 REM --RESET CHARACTER SET POINTER--
140 POKE 756,S/256
149 REM --SET COLOR REGISTERS--
150 POKE 708,156
160 POKE 709,20
170 POKE 710,56
180 POKE 711,252
189 REM --DRAW FIREPLACE SCENE--
190 FOR X=1 TO 15
200 READ KO,A,B,C,D
210 COLOR KO
220 FOR RO=A TO B
230 FOR CO=C TO D
240 PLOT CO,RO
250 NEXT CO
260 NEXT RO
270 NEXT X
280 POSITION 7,3:PRINT #6;"HOME"
290 POSITION 8,4:PRINT #6;"SWEET"
300 POSITION 9,5:PRINT #6;"HOME"
309 REM --SET LOCATION AND LENGTH OF A FLAME--
310 CO=INT(RND(1)*6)+7
320 RO=INT(RND(1)*(CO-3-(CO>10)*(2*CO-20)))
329 REM --COLOR AND DRAW THE FLAME--
330 FOR X=21 TO 21-RO STEP -1
340 COLOR 129+32*(RND(0)>0.5)+INT(RND(0)*2)
350 PLOT CO,X
360 NEXT X
369 REM --COLOR AND DRAW CANDLE FLAMES--
370 COLOR 129+32*(RND(0)>0.5)+INT(RND(0)*2)
380 PLOT 4,6
390 COLOR 129+32*(RND(0)>0.5)+INT(RND(0)*2)
400 PLOT 15,6
409 REM --ROTATE COLOR REGISTERS FOR FLICKER EFFECT--
410 T=PEEK(710)
420 POKE 710,PEEK(711)
430 POKE 711,T
440 GOTO 310
999 REM --DATA FOR CHARACTERS IN "HOME SWEET HOME"--
1000 DATA 37,40,45,47,51,52,55
1999 REM --DATA FOR REDEFINED CHARACTERS--
2000 DATA 32,48,112,120,120,120,56,16
2010 DATA 4,12,14,30,30,30,28,8
2020 DATA 255,255,255,255,255,255,255,255
2030 DATA 255,1,125,69,85,93,65,127
2999 REM --DRAWING DATA--
3000 DATA 4,10,11,2,17,3,12,13,3,16
3010 DATA 3,14,23,3,4,3,14,23,15,16
3020 DATA 3,22,22,7,12,4,1,7,6,6
3030 DATA 4,1,7,13,13,4,1,1,7,12
3040 DATA 4,7,7,7,12,35,7,9,4,4
3050 DATA 35,7,9,15,15
3060 DATA 3,21,21,6,13,32,21,21,7,12
3070 DATA 3,23,23,8,11,32,23,23,9,10

```


WINTER PROGRAMS

Commodore 64/Fireplace

```
10 DIM C(5)
20 SB=1024
30 CB=55296
40 PRINT CHR$(147)
49 REM --SET BORDER AND BACKGROUND COLORS--
50 POKE 53280,12
60 POKE 53281,1
69 REM --READ FIRE COLORS INTO ARRAY C--
70 FOR X=0 TO 5
80 READ C(X)
90 NEXT X
99 REM --DRAW BROAD AREAS OF PICTURE--
100 FOR X=1 TO 10
110 READ KO,A,B,C,D
120 FOR RO=A TO B
130 FOR CO=C TO D
140 POKE SB+CO+40*RO,160
150 POKE CB+CO+40*RO,KO
160 NEXT CO,RO,X
169 REM --DRAW DETAILS OF PICTURE--
170 FOR X=1 TO 21
180 READ CH,KO,CO,RO
190 POKE SB+CO+40*RO,CH
200 POKE CB+CO+40*RO,KO
210 NEXT X
219 REM --SET LOCATION AND LENGTH OF A FLAME--
220 CO=RND(0)*12
230 RO=RND(0)*(5+(3-CO)*(CO<3)+(CO-7)*(CO>7))
239 REM --COLOR AND DRAW THE FLAME--
240 FOR X=CO TO CO-RO*40 STEP -40
250 POKE CB+894+X,C(RND(0)*6)
260 NEXT X
269 REM --COLOR AND DRAW CANDLE FLAMES--
270 POKE CB+330,RND(1)*2+7
280 POKE CB+349,RND(1)*2+7
290 GOTO 220
999 REM --FLAME COLOR DATA--
1000 DATA 2,2,7,7,8,10
1999 REM --DRAWING DATA--
2000 DATA 9,11,12,7,32,9,13,24,8,31,11,16,24,12,27
2010 DATA 13,9,10,10,10,13,9,10,29,29,12,2,8,13,26
2020 DATA 15,3,7,14,25,0,23,23,14,25,0,24,24,16,16
2030 DATA 0,24,24,23,23,160,0,13,22,160,0,26,22,42
2040 DATA 7,10,8,42,7,29,8,95,15,13,8,105,15,26,8
2050 DATA 233,15,13,2,223,15,26,2,8,2,15,4,15,5,16
2060 DATA 4,13,8,17,4,5,4,18,4,19,3,20,4,23,10,21
2070 DATA 4,5,5,22,4,5,2,23,4,20,7,24,4,8,5,18,6
2080 DATA 15,8,19,6,13,10,20,6,5,4,21,6
```

IBM PC w/Color Graphics Adapter & IBM PCjr/Fireplace

```
10 CLS
20 KEY OFF
30 SCREEN 0,1
40 WIDTH 40
49 REM --DRAW FIREPLACE SCENE--
50 FOR X=1 TO 18
60 READ KO,A,B,C,D,CH
70 COLOR KO
80 FOR RO=A TO B
90 FOR CO=C TO D
100 LOCATE RO,CO,0
110 PRINT CHR$(CH);
120 NEXT CO
130 NEXT RO
140 NEXT X
149 REM --SET LOCATION AND LENGTH OF A FLAME--
150 CO=RND*7+18
160 RO=RND*(CO-16-(CO>21)*(43-2*CO))
169 REM --COLOR AND DRAW THE FLAME--
170 FOR X=21 TO 21-RO STEP -1
180 COLOR 4
190 IF RND>.3 THEN COLOR 14
200 IF RND>.6 THEN COLOR 6
210 LOCATE X,CO
220 PRINT CHR$(219);
```

```
230 NEXT X
239 REM --COLOR AND DRAW CANDLE FLAMES--
240 IF RND(0)>.5 THEN COLOR 14
250 LOCATE 8,12
260 PRINT CHR$(15);
270 IF RND(0)>.5 THEN COLOR 14
280 LOCATE 8,30
290 PRINT CHR$(15);
300 GOTO 150
1000 DATA 6,12,13,11,31,219,6,14,24,13,29,219,0,15
1010 DATA 23,15,27,219,4,22,22,17,25,176,4,23,23,16
1020 DATA 16,176,4,23,23,26,26,176,5,1,8,16,26,177
1030 DATA 1,2,7,17,25,219,14,9,11,12,12,177,14,9,11
1040 DATA 30,30,177,2,5,7,17,25,219,4,4,5,19,23,178
1050 DATA 0,4,4,18,18,219,0,3,3,19,23,219,0,4,4,24
1060 DATA 24,219,11,6,6,21,21,219,11,7,7,22,22,219
1070 DATA 6,5,5,21,21,219
```

TI-99/4A/Fireplace

```
10 CALL CLEAR
20 RANDOMIZE
30 DIM KO(3)
39 REM --PUT FIRE CHARACTERS INTO ARRAY KO--
40 KO(1)=40
50 KO(2)=48
60 KO(3)=56
69 REM --SET COLORS OF CHARACTERS FOR DRAWING--
70 FOR X=2 TO 14
80 READ R,B
90 CALL COLOR(X,R,B)
100 NEXT X
109 REM --DEFINE A SET OF BLOCK CHARACTERS--
110 AS="FFFFFFFFFFFFFFFF"
120 FOR X=1 TO 9
130 READ CH
140 CALL CHAR(CH,AS)
150 NEXT X
160 CALL SCREEN(16)
169 REM --DRAW BROAD AREAS OF PICTURE--
170 FOR X=1 TO 8
180 READ A,B,CO,REP,CH
190 FOR RO=A TO B
200 CALL HCHAR(RO,CO,CH,REP)
210 NEXT RO
220 NEXT X
229 REM --DRAW DETAILS OF PICTURE--
230 FOR X=1 TO 17
240 READ RO,CO,CH
250 CALL HCHAR(RO,CO,CH)
260 NEXT X
269 REM --SET LOCATION AND LENGTH OF A FLAME--
270 CO=INT(RND*10)+12
280 RO=INT(RND*(6+(17-CO)*(CO<17)+(CO-17)*(CO>18)))
289 REM --COLOR AND DRAW THE FLAME--
290 FOR X=22 TO 22-RO STEP -1
300 CALL HCHAR(X,CO,KO(INT(RND*3)+1))
310 NEXT X
319 REM --COLOR AND DRAW CANDLE FLAMES--
320 CALL HCHAR(8,8,INT(RND*2)+42)
330 CALL HCHAR(8,25,INT(RND*2)+42)
340 GOTO 270
999 REM --COLOR AND CHARACTER DATA--
1000 DATA 12,1,9,9,10,10,14,1,3,1,6,1
1010 DATA 8,8,7,7,15,15,2,2,8,8,12,12,16,16
1999 REM --THESE CHARACTERS ARE REDEFINED BLOCKS--
2000 DATA 40,48,56,96,104,112,120,128,136
2999 REM --DRAWING DATA--
3000 DATA 12,13,5,24,96,14,24,6,22,96
3010 DATA 16,24,10,14,104,23,23,12,10,112
3020 DATA 9,11,8,1,120,9,11,25,1,120
3030 DATA 2,10,11,12,128,3,9,12,10,136
3040 DATA 22,11,112,24,13,112,22,22,112
3050 DATA 24,20,112,4,13,72,4,14,79
3060 DATA 4,15,77,4,16,69,6,15,83
3070 DATA 6,16,87,6,17,69,6,18,69
3080 DATA 6,19,84,8,17,72,8,18,79
3090 DATA 8,19,77,8,20,69
```


WINTER PROGRAMS

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

```
10 DIM D(5)
20 LET DS="9,10,3,28,138,11,21,4,27,128,13,21,8,23,"
30 LET DS=DS+"0,6,8,6,6,128,6,8,25,25,128,1,7,9,22,"
40 LET DS=DS+"8,2,6,10,21,0,20,20,10,21,128,19,19,"
50 LET DS=DS+"9,9,128,19,19,22,22,128,21,21,13,13,"
60 LET DS=DS+"128,21,21,18,18,128,"
70 LET P1=1
80 LET P2=2
89 REM --DRAW FIREPLACE SCENE--
90 FOR X=1 TO 12
100 FOR Y=1 TO 5
110 GOSUB 1000
120 NEXT Y
130 FOR R=D(1) TO D(2)
140 FOR C=D(3) TO D(4)
150 PRINT AT R,C;CHR$(D(5))
160 NEXT C
170 NEXT R
180 NEXT X
190 PRINT AT 3,11;"HOME SWEET";AT 5,13;"*HOME*"
199 REM --SET LOCATION AND LENGTH OF A FLAME--
200 LET CO=RND*11+10
210 LET RO=RND*(5-(CO<13)+(13-CO)-(CO>17)*(CO-17))
219 REM --DRAW THE FLAME--
220 FOR X=19 TO 19-RO STEP -1
230 PRINT AT X,CO;CHR$(RND*3+136)
240 NEXT X
249 REM --DRAW CANDLE FLAMES--
250 PRINT AT 5,6;CHR$(21+2*(RND>0.5))
260 PRINT AT 5,25;CHR$(21+2*(RND>0.5))
270 GOTO 200
999 REM --SIMULATED "READ" SUBROUTINE--
1000 IF D$(P2)="," THEN GOTO 1030
1010 LET P2=P2+1
1020 GOTO 1000
1030 LET D(Y)=VAL D$(P1 TO P2-1)
1040 LET P2=P2+1
1050 LET P1=P2
1060 RETURN
```

TRS-80 Color Computer/Fireplace

```
10 DIM C(5)
20 CLS(0)
29 REM --READ CODES OF FIRE CHARACTERS INTO ARRAY C--
30 FOR X=0 TO 5
40 READ C(X)
50 NEXT X
59 REM --DRAW BROAD AREAS OF PICTURE--
60 FOR X=1 TO 7
70 READ CH,A,B,C,D
80 FOR RO=A TO B
90 FOR CO=C TO D
100 PRINT@CO+32*RO,CHR$(CH);
110 NEXT CO,RO,X
119 REM --DRAW DETAILS OF PICTURE--
120 FOR X=1 TO 31
130 READ CH,RO,CO
140 PRINT@CO+32*RO,CHR$(CH);
150 NEXT X
159 REM --SET LOCATION AND LENGTH OF A FLAME--
160 CO=RND(10)
170 RO=RND(2+(3-CO)*(CO<3)+(CO-8)*(CO>8))
179 REM --COLOR AND DRAW THE FLAME--
180 FOR X=CO TO CO-32*RO STEP -32
190 PRINT@658+X,CHR$(143+C(RND(5)));
200 NEXT X
209 REM --COLOR AND DRAW CANDLE FLAMES--
210 PRINT@135,CHR$(140+C(RND(2)));
220 PRINT@152,CHR$(140+C(RND(2)));
230 GOTO 160
999 REM --CODES FOR FIRE-COLORED CHARACTERS--
1000 DATA 48,112,16,48,112,16
1999 REM --DRAWING DATA--
2000 DATA 239,7,8,5,26,239,9,10,6,25,239,11,15,6
```

```
2010 DATA 25,207,11,15,10,21,195,15,15,11,20,207
2020 DATA 1,5,9,22,143,2,4,10,21,199,1,9,203,1,22
2030 DATA 205,5,9,206,5,22,223,5,7,223,5,24,206,5
2040 DATA 22,223,5,7,199,15,21,203,15,10,223,6,7
2050 DATA 223,6,24,206,14,10,205,14,21,128,15,12
2060 DATA 128,15,19,72,2,11,79,2,12,77,2,13,69,2
2070 DATA 14,83,2,16,87,2,17,69,2,18,69,2,19,84
2080 DATA 2,20,42,4,12,72,4,14,79,4,15,77,4,16
2090 DATA 69,4,17,42,4,19
```

TRS-80 Model III/Fireplace

```
10 CLS
19 REM --DRAW FIREPLACE SCENE--
20 FOR X=1 TO 12
30 READ CH,A,B,C,D
40 FOR RO=A TO B
50 FOR CO=C TO D
60 PRINT@CO+64*RO,CHR$(CH);
70 NEXT CO,RO,X
80 PRINT@215;"HOME SWEET HOME";
89 REM --SET LOCATION AND LENGTH OF A FLAME--
90 CO=RND(18)
100 RO=RND(4+(5-CO)*(CO<5)+(CO-14)*(CO>14))
109 REM --DRAW THE FLAME--
110 FOR X=0 TO RO
120 PRINT@918+CO-X*64,CHR$(RND(64)+127);
130 NEXT X
139 REM --FLICKER THE CANDLE FLAMES--
140 PRINT@273,CHR$(RND(2)+41);
150 PRINT@302,CHR$(RND(2)+41);
160 GOTO 90
1000 DATA 191,7,7,12,51,191,8,15,14,49,128,9,15,21
1010 DATA 42,131,15,15,23,40,191,1,5,21,42,128,2,4
1020 DATA 22,41,176,14,14,22,22,176,14,14,41,41,191
1030 DATA 15,15,26,26,191,15,15,37,37,191,5,6,17,17
1040 DATA 191,5,6,46,46
```

VIC-20/Fireplace

```
10 PRINT CHR$(147)
19 REM --SET BORDER AND BACKGROUND COLORS--
20 POKE 36879,24
29 REM --DRAW BROAD AREAS OF PICTURE--
30 FOR X=1 TO 10
40 READ KO,A,B,C,D
50 FOR RO=A TO B
60 FOR CO=C TO D
70 POKE 7680+CO+22*RO,160+58*(X<4)
80 POKE 38400+CO+22*RO,KO
90 NEXT CO,RO,X
99 REM --DRAW DETAILS OF PICTURE--
100 FOR X=1 TO 21
110 READ CH,KO,CO,RO
120 POKE 7680+CO+22*RO,CH
130 POKE 38400+CO+22*RO,KO
140 NEXT X
149 REM --PICK LOCATION AND LENGTH OF A FLAME--
150 CO=RND(1)*8
160 RO=RND(1)*(5+(3-CO)*(CO<3)+(CO-4)*(CO>4))
169 REM --COLOR AND DRAW THE FLAME--
170 FOR X=0 TO RO
180 POKE 7680+447+CO-X*22,160
190 POKE 38400+447+CO-X*22,2-5*(RND(1)<0.5)
200 NEXT X
209 REM --COLOR AND DRAW CANDLE FLAMES--
210 POKE 38400+136,2-5*(RND(1)<0.5)
220 POKE 38400+149,2-5*(RND(1)<0.5)
230 GOTO 150
1000 DATA 2,10,11,2,19,2,12,22,3,18,0,14,22,6
1010 DATA 15,6,1,7,6,15,1,2,6,7,14,3,7,9,4,4,3
1020 DATA 7,9,17,17,0,22,22,8,8,0,22,22,13,13
1030 DATA 0,21,21,7,14,160,0,6,20,160,0,15,20
1040 DATA 8,3,8,3,15,2,9,3,13,7,10,3,5,6,11,3
1050 DATA 19,4,9,4,23,6,10,4,5,3,11,4,5,2,12
1060 DATA 4,20,7,13,4,8,4,10,5,15,7,11,5,13,6
1070 DATA 12,5,5,2,13,5,95,6,6,7,105,6,15,7,233
1080 DATA 6,6,1,223,6,15,1,42,7,4,6,42,7,17,6
```


PERPETUAL CALENDAR



Was Dec. 7, 1941, a Sunday? What? You don't have a 1941 calendar handy? Don't worry—*Perpetual Calendar* can pinpoint the day of the week for dates from Jan. 1, 1801, to Dec. 31, 2399!

When you RUN the program, the computer will prompt you to enter a date in the following format: MONTH.DAY.YEAR. Use only digits; and enter all four

digits of the year instead of the usual two (for example, you would enter Dec. 31, 1984, as 12.31.1984—not 12.31.84).

Not only will the computer tell you on what day of the week that date fell, it'll also show you the calendar for that whole month!

Oh . . . by the way, on what day of the week were you born? Type in *Perpetual Calendar* and find out!

ADAM/Perpetual Calendar

```

10 DIM dw$(7),mo$(12),ld(12)
19 REM --INITIALIZE VARIABLES AND ARRAYS--
20 bl$ = ""
30 FOR i = 1 TO 7
40 READ dw$(i)
50 bl$ = bl$+" "
60 NEXT i
70 FOR i = 1 TO 12
80 READ mo$(i),ld(i)
90 NEXT i
100 dy$ = " 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31"
109 REM --ASK FOR, ACCEPT, AND CHECK INPUT--
110 HOME
120 PRINT TAB(6);"PERPETUAL CALENDAR"
130 PRINT
140 PRINT "Type in a date in any year"
150 PRINT "after 1800 and before 2400;"
160 PRINT "then press <RETURN>."
170 PRINT "Use this format:"
180 PRINT
190 PRINT "1,31,1985"
200 PRINT
210 INPUT "Date? ";m,d,y
220 ld(2) = 28+((y = INT(y/4)*4 AND y <> INT(y/100)*100) OR y = 2000)
230 IF m < 1 OR m > 12 THEN 170
240 IF d < 1 OR d > ld(m) OR y < 1801 OR y > 2399 THEN 170
249 REM --COMPUTE WHAT DAY THE DATE FALLS ON (dow)--
250 IF m < 3 THEN y = y-1:m = m+12
260 fom = INT(y*1.25)+(y < 1900)+(y > 2000)*INT((y-2000)/100)+INT((m-2)*2.59)
270 dow = fom+d-INT((fom+d-1)/7)*7
279 REM --fom IS DAY THAT FIRST OF MONTH m FALLS ON--
280 fom = fom-INT(fom/7)*7+1
290 IF m > 12 THEN m = m-12:y = y+1
299 REM --PRINT DAY OF WEEK AND TOP OF CALENDAR PAGE--
300 HOME
310 PRINT mo$(m);" ";d;" ",y;" is a"
320 PRINT dw$(dow);"."
330 PRINT TAB(107-LEN(mo$(m))/2);mo$(m);" ";y
340 PRINT
350 PRINT TAB(3);
360 FOR i = 1 TO 7
370 PRINT LEFT$(dw$(i),3);" ";
380 NEXT i
390 PRINT
400 PRINT
409 REM --PRINT BODY OF CALENDAR--
410 dy$ = bl$+LEFT$(dy$,2*ld(m))+bl$+bl$
420 FOR i = 1 TO 6
430 PRINT TAB(3);
440 FOR j = 1 TO 7
450 pt = i*7+j-fom-6
459 REM --PRINT SELECTED DAY IN INVERSE--
460 IF pt = d AND d < 10 THEN PRINT " ";
470 IF pt = d THEN INVERSE:PRINT d;:NORMAL:GOTO 490
480 PRINT MID$(dy$,2*pt+13,2);
490 PRINT " ";
500 NEXT j
510 PRINT
520 PRINT
530 NEXT i
540 PRINT
549 REM --DO ANOTHER DATE OR STOP--
550 PRINT "Press <Q> to quit or any other"
560 PRINT "key to try another date.";
570 GET k$
580 IF k$ <> "q" AND k$ <> CHR$(113) THEN 100
590 END
1000 DATA SUNDAY,MONDAY,TUESDAY,WEDNESDAY
1010 DATA THURSDAY,FRIDAY,SATURDAY
2000 DATA January,31,February,28,March,31
2010 DATA April,30,May,31,June,30
    
```


WINTER PROGRAMS

```

490 PRINT SPC(4);
500 NEXT J
510 PRINT
520 NEXT I
530 PRINT
539 REM --DO ANOTHER DATE OR STOP--
540 PRINT "Press <Q> to quit or any other key to"
550 PRINT "try another date.";
560 K$=INKEY$
570 IF K$="" THEN 560
580 IF K$<>"Q" AND K$<>CHR$(113) THEN 150 ELSE END
1000 DATA SUNDAY,MONDAY,TUESDAY,WEDNESDAY
1010 DATA THURSDAY,FRIDAY,SATURDAY
2000 DATA January,31,February,28,March,31
2010 DATA April,30,May,31,June,30
2020 DATA July,31,August,31,September,30
2030 DATA October,31,November,30,December,31

```

Ti-99/4A/Perpetual Calendar

```

10 DIM DWS(7),MOS(12),LD(12)
19 REM --INITIALIZE VARIABLES AND ARRAYS--
20 FOR I=1 TO 7
30 READ DWS(I)
40 NEXT I
50 FOR I=1 TO 12
60 READ MOS(I),LD(I)
70 NEXT I
79 REM --ASK FOR, ACCEPT, AND CHECK INPUT--
80 CALL CLEAR
90 PRINT TAB(6);"PERPETUAL CALENDAR"
100 PRINT
110 PRINT "Type in a date in any year"
120 PRINT "after 1800 and before 2400;"
130 PRINT "then press <ENTER>."
140 PRINT "Use this format:"
150 PRINT
160 PRINT "1,31,1985"
170 PRINT
180 INPUT "Date? ":M,D,Y
190 LD(2)=28-SGN(((Y=INT(Y/4)*4)*(Y<>INT(Y/100)*100))+
(Y=2000))
200 IF (M<1)+(M>12) THEN 140
210 IF (D<1)+(D>LD(M))+(Y<1801)+(Y>2399) THEN 140
219 REM --COMPUTE WHAT DAY THE DATE FALLS ON (DOW)--
220 IF M>2 THEN 250
230 Y=Y-1
240 M=M+12
250 FOM=INT(Y*1.25)-(Y<1900)-(Y>2000)*INT((Y-2000)/100)
)+INT((M-2)*2.59)
260 DOW=FOM+D-INT((FOM+D-1)/7)*7
269 REM --FOM IS DAY THAT FIRST OF MONTH M FALLS ON--
270 FOM=FOM-INT(FOM/7)*7+1
280 IF M<13 THEN 310
290 M=M-12
300 Y=Y+1
309 REM --PRINT DAY OF WEEK AND TOP OF CALENDAR PAGE--
310 CALL CLEAR
320 PRINT MOS(M);" ";STR$(D);", ";STR$(Y);", is a ";DW
$(DOW)&". "
330 PRINT
340 PRINT
350 PRINT
360 PRINT
369 REM --PRINT BODY OF CALENDAR--
370 PRINT TAB((24-LEN(MOS(M)))/2);MOS(M);Y
380 PRINT
390 FOR I=1 TO 7
400 PRINT " ";SEGS(DWS(I),1,3);
410 NEXT I
420 PRINT
430 PRINT
440 PRINT TAB(4*FOM-3);
450 FOR I=1 TO LD(M)
460 IF I>9 THEN 480

```

```

470 PRINT " ";
480 IF I<>D THEN 510
489 REM --POINT TO SELECTED DAY--
490 PRINT ">";STR$(D);"<";
500 GOTO 520
510 PRINT I;
520 NEXT I
530 PRINT
540 PRINT
550 PRINT
559 REM --DO ANOTHER DATE OR STOP--
560 PRINT "Press <Q> to quit or any"
570 PRINT "other key to try another"
580 PRINT "date."
590 CALL KEY(3,K,S)
600 IF S=0 THEN 590
610 IF (K<>81)*(K<>113) THEN 80
1000 DATA SUNDAY,MONDAY,TUESDAY,WEDNESDAY
1010 DATA THURSDAY,FRIDAY,SATURDAY
2000 DATA January,31,February,28,March,31
2010 DATA April,30,May,31,June,30
2020 DATA July,31,August,31,September,31
2030 DATA October,31,November,30,December,31

```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Perpetual Calendar

```

10 FAST
20 DIM DS(7,10)
30 DIM MS(12,9)
40 DIM L(12)
49 REM --INITIALIZE VARIABLES AND ARRAYS--
50 LET P1=1
60 LET P2=7
70 LET IS="SUNDAY,MONDAY,TUESDAY,WEDNESDAY,"
80 LET IS=IS+"THURSDAY,FRIDAY,SATURDAY,"
90 LET IS=IS+"JANUARY,31,FEBRUARY,28,MARCH,31,"
100 LET IS=IS+"APRIL,30,MAY,31,JUNE,30,JULY,31,"
110 LET IS=IS+"AUGUST,31,SEPTEMBER,30,OCTOBER,31,"
120 LET IS=IS+"NOVEMBER,30,DECEMBER,31,"
130 FOR I=1 TO 7
140 GOSUB 1000
150 LET DS(I)=RS
160 LET DS(I,10)=CHR$(LEN RS)
170 NEXT I
180 FOR I=1 TO 12
190 GOSUB 1000
200 LET MS(I)=RS
210 LET MS(I,9)=CHR$(LEN RS)
220 GOSUB 1000
230 LET L(I)=VAL RS
240 NEXT I
249 REM --ASK FOR, ACCEPT, AND CHECK INPUT--
250 SLOW
260 CLS
270 PRINT AT 0,7;"PERPETUAL CALENDAR"
280 PRINT AT 2,0;"TYPE IN A DATE IN ANY YEAR"
290 PRINT "AFTER 1800 AND BEFORE 2400;"
300 PRINT "THEN PRESS <ENTER>."
310 PRINT AT 5,0;"USE THIS FORMAT:"
320 PRINT AT 7,0;"1,31,1985"
330 PRINT AT 9,0;"DATE? ";
340 INPUT IS
350 PRINT IS$
360 LET IS=IS+","
370 LET P1=1
380 LET P2=2
390 GOSUB 1000
400 LET M=VAL RS
410 IF M<1 OR M>12 THEN GOTO 260
420 GOSUB 1000
430 LET D=VAL RS
440 GOSUB 1000
450 LET Y=VAL RS
460 FAST

```


SUPERMARKET SWEETHEARTS

True Love at the Checkout Counter

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

It was the frozen brussels sprouts—or, to be precise, the lack of them—that first brought Linda and Bill together one snowy January afternoon nearly a year ago. The alert young assistant manager of Frozen Foods noted the look of pretty confusion on his customer's face as she peered through the icy haze in search of the delicacy. "Excuse me, Miss . . ." he inquired gently. "Might I be of some assistance?"

"Brussels sprouts . . ." she murmured coolly. Their eyes met. She caught her breath.

"Oh! Sorry, Miss," Bill muttered apologetically. "All out of sprouts today. More in on Friday, but . . ."—he warmed to the shyly smiling girl—" . . . have you tried our frozen cauliflower tips with creamy cheese sauce? Generic, you know. Package doesn't look like much, but it's quite good." Her smile broadened and, shyness melting, she laughed.

By spring, the earnest young grocer and the charming shopper were a hot item in the gossip aisle of the Grand Onion Superette. Linda would shop there most every day. On seeing her, Bill would contrive to shrug aside—for a few precious minutes—the icy machinations of the frozen-food business, and they would stroll through the aisles hand in hand—billing at the checkout counter and cooing in the poultry department. They were always playing romantic little jokes on one

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



Josh

another. Linda delighted in writing notes to Bill, and taping them to the running lights of his scooter as it stood in the parking lot. Bill was fond of drawing up special coupons for

free hugs and kisses, sneaking them into Linda's grocery bags when her attention was distracted. Linda loved finding these coupons. She saved them in a coupon holder with a

big, cardboard heart pasted on top.

For the anniversary of their first date, Linda decided to prepare a special candlelit dinner for Bill—fettuccine Alfredo and


```

270 IF K<>71 THEN 260
280 PRINT CL$;SP$(1,3);"AT DINNER, LINDA REPLIES TO BI
LL'S"
290 PRINT SP$(1,4);"MESSAGE BY GIVING HIM WHAT ITEM?"
300 POSITION 0,3:GOSUB 1000:IF TS="" THEN 300
310 F=0:FOR I=9 TO 11:GOSUB 2000:NEXT I:IF F THEN 420
320 PRINT CL$;SP$(1,17);"WRONG!":POSITION 0,20
330 PRINT "PRESS <S> TO SHOP SOME MORE, <V> TO VIEW";
340 PRINT " COUPONS, <G> TO GUESS, OR <H> FOR A";SP$(
1,20);"HINT."
350 GET #1,K:IF K=83 THEN PRINT CL$;GOTO 130
360 IF K=71 THEN 280
370 IF K=86 THEN 190
380 IF K<>72 THEN 350
390 PRINT CL$;SP$(1,5);S$(DP(12),105);SP$(1,19);S$(107
,117);"."
400 POSITION 7,20:PRINT "PRESS ANY KEY TO CONTINUE."
410 GET #1,K:GOTO 190
420 PRINT CL$;SP$(1,2);"HARK! DO I HEAR WEDDING BELLS
...?"
430 FOR D=1 TO 800:NEXT D
440 FOR I=1 TO 38:SOUND 0,PITCH(I),10,8
450 FOR D=1 TO DUR(I)*25:NEXT D:SOUND 0,0,0,0:NEXT I
460 POKE 752,0:END
1000 POKE 752,0:INPUT TS:POKE 752,1:RETURN
2000 K=DP(I+1)-DP(I):IF K>LEN(TS) THEN RETURN
2010 FOR J=1 TO LEN(TS)-K+1
2020 IF TS(J,J+K-1)<>S$(DP(I),DP(I+1)-1) THEN 2050
2030 IF I>8 THEN F=1:GOTO 2050
2040 FL(I)=1:FC=FC+1
2050 NEXT J:RETURN
3000 DATA 162,6,121,4,121,2,121,12,162,6,108,4,128,2
3010 DATA 121,12,162,6,121,4,91,2,91,6,96,4,108,2
3020 DATA 121,4,108,1,121,1,128,4,121,2,108,12
3030 DATA 162,6,121,4,121,2,121,12,162,6,108,4
3040 DATA 128,2,121,12,162,6,121,4,96,2,81,6
3050 DATA 96,4,121,2,144,6,108,4,128,2,121,12
4000 DATA 1,PIKWQH,1,KALDEL,1,ILQNNBN,1,READC
4010 DATA 1,RUZWWKW,2,WPXIXA,MQERFFVAT,2,PSQAU,NAWL
4020 DATA 2,KNLE,LRAAP,1,MZNFNEN,2,WBVB,EIT
4030 DATA 1,NSMS!RC,7,PIKSSUI,IFRUU,LNQ
4040 DATA KESP,SIKHWVM,JYP,KZMDPCGLETZY

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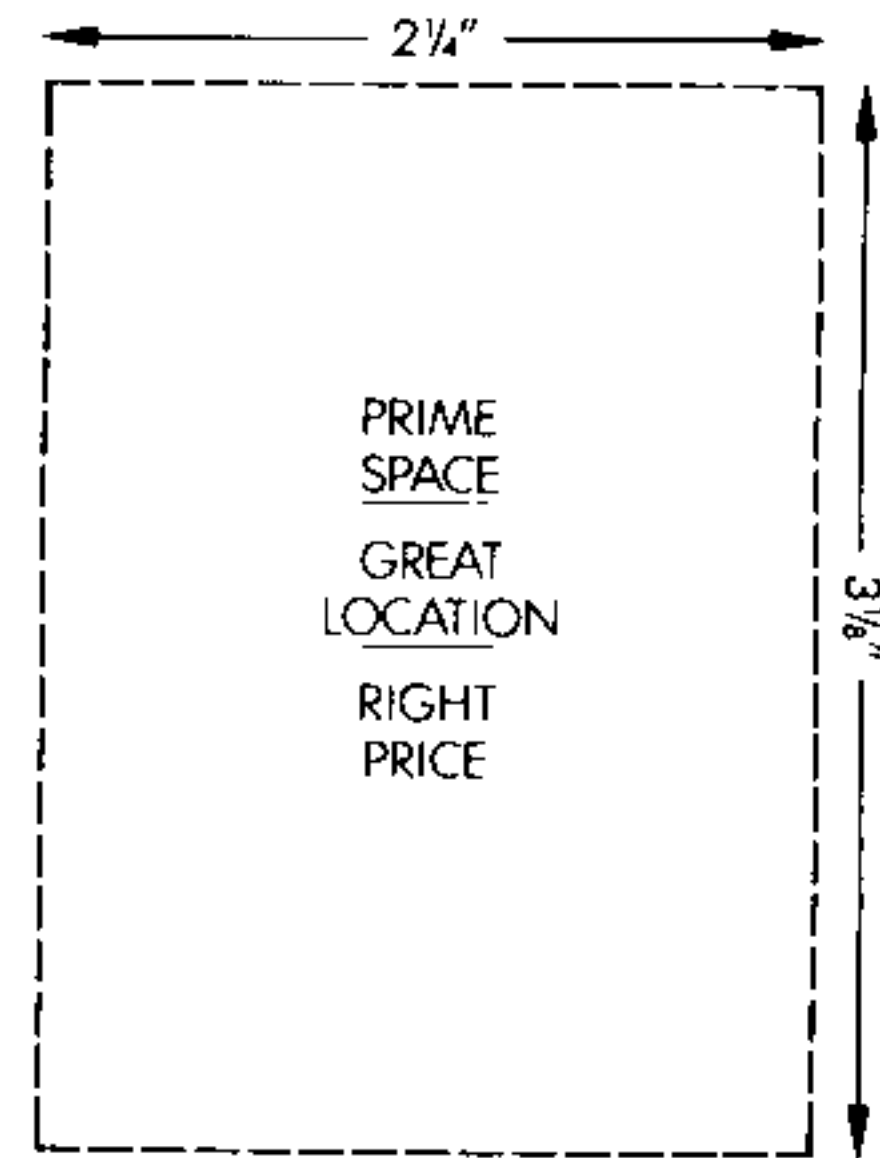
TI-99/4A/Supermarket Sweethearts

```

10 DIM S$(12),PITCH(38),DUR(38),FL(4)
20 FOR I=1 TO 4
30 FL(I)=0
40 NEXT I
50 C=1
60 FC=0
70 QS=CHR$(34)&"END"&CHR$(34)
80 FOR I=1 TO 38
90 READ PITCH(I),DUR(I)
100 NEXT I
110 FOR I=1 TO 12
120 TS=""
130 READ K
140 FOR J=1 TO K
150 READ AS
160 V=ASC(SEG$(AS,1,1))-64
170 FOR Z=2 TO LEN(AS)
180 N=ASC(SEG$(AS,Z,1))-V
190 TS=TS&CHR$(N-26*(N<65))
200 NEXT Z
210 TS=TS&" "
220 NEXT J
230 S$(I)=SEG$(TS,1,LEN(TS)-1)
240 NEXT I
250 CALL CLEAR
260 PRINT TAB(3);"SUPERMARKET SWEETHEARTS"
270 PRINT
280 PRINT " WHAT SHOULD LINDA BUY FOR"
290 PRINT TAB(11);"DINNER?"
300 PRINT " (ENTER ";QS;" WHEN DONE.)"

```

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PUZZLE

```

310 PRINT
320 PRINT "ITEM #";C;
330 INPUT TS
340 IF TS="" THEN 320
350 IF SEG$(TS,1,3)="END" THEN 420
360 C=C+1
370 FOR I=1 TO 4
380 IF FL(I)<>0 THEN 400
390 GOSUB 1000
400 NEXT I
410 GOTO 320
420 CALL CLEAR
430 IF FC<>0 THEN 460
440 PRINT TAB(5);"YOU HAVE NO COUPONS."
450 GOTO 510
460 PRINT "YOU NOW HAVE COUPONS FOR ... "
470 FOR M=1 TO FC
480 PRINT " 25 CENTS OFF ANY BRAND OF"
490 PRINT TAB((28-LEN(SS(M+4)))/2+1);SS(M+4)
500 NEXT M
510 GOSUB 2000
520 PRINT "PRESS <S> TO SHOP SOME MORE"
530 PRINT TAB(7);"OR <G> TO GUESS."
540 GOSUB 3000
550 IF (K<>71)*(K<>83) THEN 540
560 CALL CLEAR
570 IF K=83 THEN 280
580 PRINT "AT DINNER, LINDA REPLIES TO"
590 PRINT " BILL'S MESSAGE BY GIVING"
600 PRINT TAB(8);"HIM WHAT ITEM?"
610 PRINT
620 INPUT TS
630 IF TS="" THEN 560
640 F=0
650 FOR I=9 TO 11
660 GOSUB 1000
670 NEXT I
680 IF F THEN 870
690 CALL CLEAR
700 PRINT TAB(12);"WRONG!"
710 GOSUB 2000
720 PRINT "PRESS <S> TO SHOP SOME MORE,"
730 PRINT "<V> TO VIEW COUPONS, <G> TO"
740 PRINT " GUESS, OR <H> FOR A HINT."
750 GOSUB 3000
760 IF (K<>71)*(K<>72)*(K<>83)*(K<>86) THEN 750
770 CALL CLEAR
780 IF K=83 THEN 280
790 IF K=71 THEN 580
800 IF K=86 THEN 430
810 PRINT SEG$(SS(12),1,27)
820 PRINT TAB(7);SEG$(SS(12),29,43);"."
830 GOSUB 2000
840 PRINT " PRESS ANY KEY TO CONTINUE."
850 GOSUB 3000
860 GOTO 420
870 CALL CLEAR
880 PRINT " HARK! DO I HEAR WEDDING"
890 PRINT TAB(9);"BELLS ... ?"
900 FOR D=1 TO 600
910 NEXT D
920 FOR I=1 TO 38
930 CALL SOUND(DUR(I)*120,PITCH(I),0)
940 NEXT I
950 END
1000 K=LEN(SS(I))
1010 FOR J=1 TO LEN(TS)-K+1
1020 IF SEG$(TS,J,K)<>SS(I) THEN 1080
1030 IF I<5 THEN 1060
1040 F=-1
1050 GOTO 1080
1060 FL(I)=1
1070 FC=FC+1
1080 NEXT J
1090 RETURN
2000 FOR I=1 TO 10

```

```

2010 PRINT
2020 NEXT I
2030 RETURN
3000 CALL KEY(3,K,S)
3010 IF S=0 THEN 3000
3020 RETURN
4000 DATA 196,6,262,4,262,2,262,12,196,6,294,4,247,2
4010 DATA 262,12,196,6,262,4,349,2,349,6,330,4,294,2
4020 DATA 262,4,294,1,262,1,247,4,262,2,294,12,196,6
4030 DATA 262,4,262,2,262,12,196,6,294,4,247,2,262
4040 DATA 12,196,6,262,4,330,2,392,6,330,4,262,2,220
4050 DATA 6,294,4,247,2,262,12
5000 DATA 1,PIKWQH,1,KALDEL,1,ILQNNBN,1,READC
5010 DATA 1,RUZWKW,2,WPXIXA,MGERFFVAT,2,PSQAU,NAWL
5020 DATA 2,KNLE,LRAAP,1,MZNFNEN,2,WBVB,EIT
5030 DATA 1,NSMS!RC,7,PIKSSUI,IFRUU,LNQ
5040 DATA KESP,SIKHWVM,JYP,KZMPCGLETZY

```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Supermarket Sweethearts

```

10 FAST
20 DIM P(13)
30 DIM F(4)
40 FOR I=1 TO 4
50 LET F(I)=0
60 NEXT I
70 LET P(1)=1
80 LET C=1
90 LET FC=0
100 LET DI=7
110 LET DJ=1
120 LET PS="111112221227"
130 LET TS=""
140 LET SS=""
150 LET ZS="PIKWQH,KALDEL,ILQNNBN,READC,RUZWKW,WPXIXA,
MGERFFVAT,PSQAU,NAWL,KNLE,LRAAP,MZNFNEN,WBVB,EIT,NSM
S,NRC,PIKSSUI,IFRUU,LNQ,KESP,SIKHWVM,JYP,KZMPCGLETZY"
160 FOR I=1 TO 12
170 FOR J=1 TO VAL PS(I)
180 GOSUB 2000
190 LET SS=SS+" "
200 LET P(I+1)=LEN SS+1
210 NEXT J
220 NEXT I
230 LET SS(83)="-"
240 SLOW
250 PRINT TAB 4;"SUPERMARKET SWEETHEARTS"
260 PRINT
270 PRINT TAB 3;"WHAT SHOULD LINDA BUY FOR"
280 PRINT "DINNER? (ENTER ";CHR$(11);"END";CHR$(11);" WH
EN DONE.)"
290 PRINT
300 PRINT "ITEM ";C;": ";
310 INPUT TS
320 PRINT TS
330 IF TS="" THEN GOTO 300
340 IF LEN TS<3 THEN GOTO 390
350 IF TS( TO 3)="END" THEN GOTO 410
360 FOR I=1 TO 4
370 IF F(I)=0 THEN GOSUB 1000
380 NEXT I
390 LET C=C+1
400 GOTO 300
410 CLS
420 IF FC<>0 THEN GOTO 450
430 PRINT TAB 6;"YOU HAVE NO COUPONS."
440 GOTO 520
450 PRINT TAB 2;"YOU NOW HAVE COUPONS FOR ... "
460 PRINT
470 FOR M=1 TO FC
480 PRINT TAB 4;"25 CENTS OFF ANY BRAND OF"
490 LET TS=SS(P(M+4) TO P(M+5)-2)
500 PRINT TAB (32-LEN TS)/2;TS
510 NEXT M
520 PRINT AT 20,1;"PRESS <S> TO SHOP SOME MORE OR"

```




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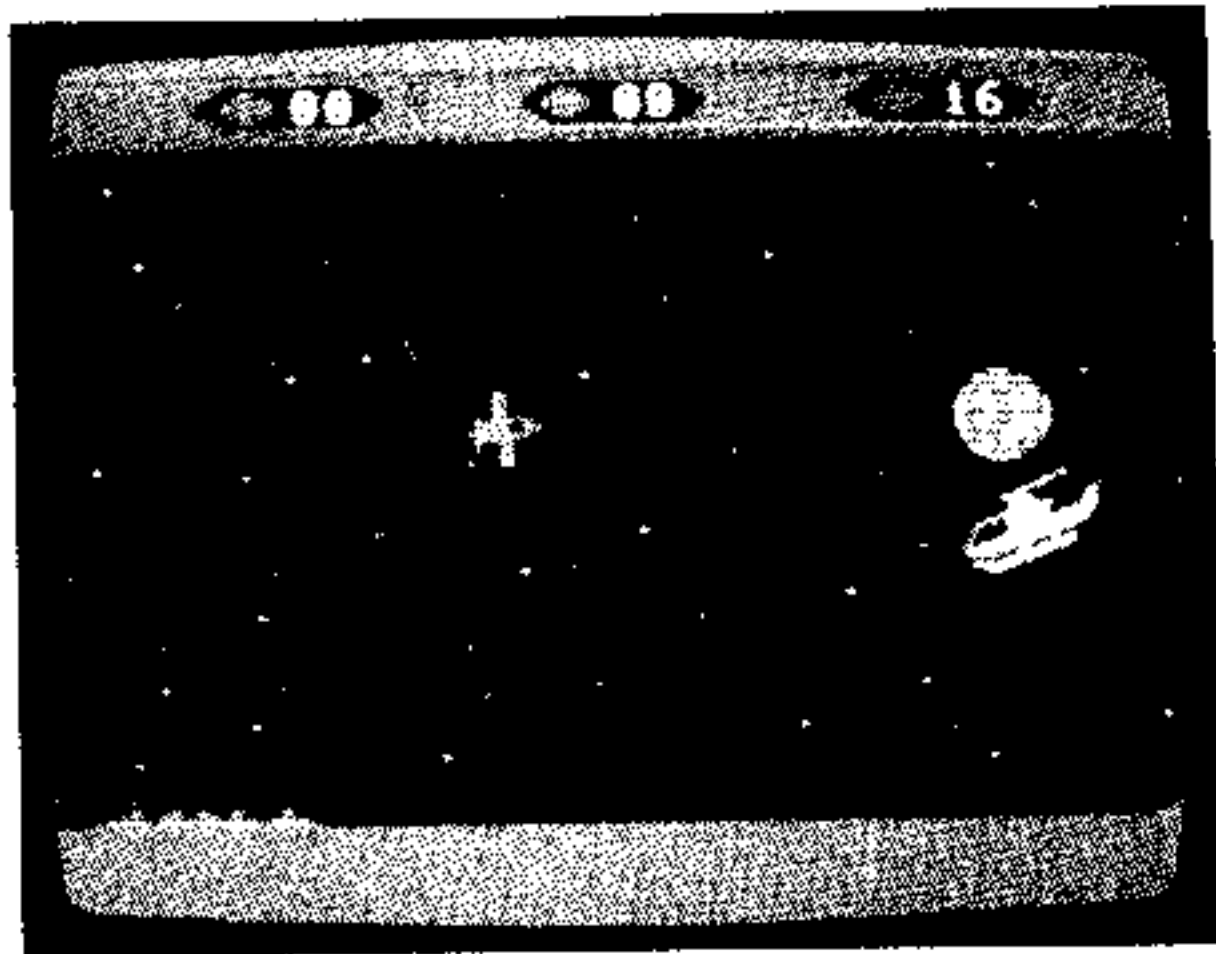
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CHOPLIFTER

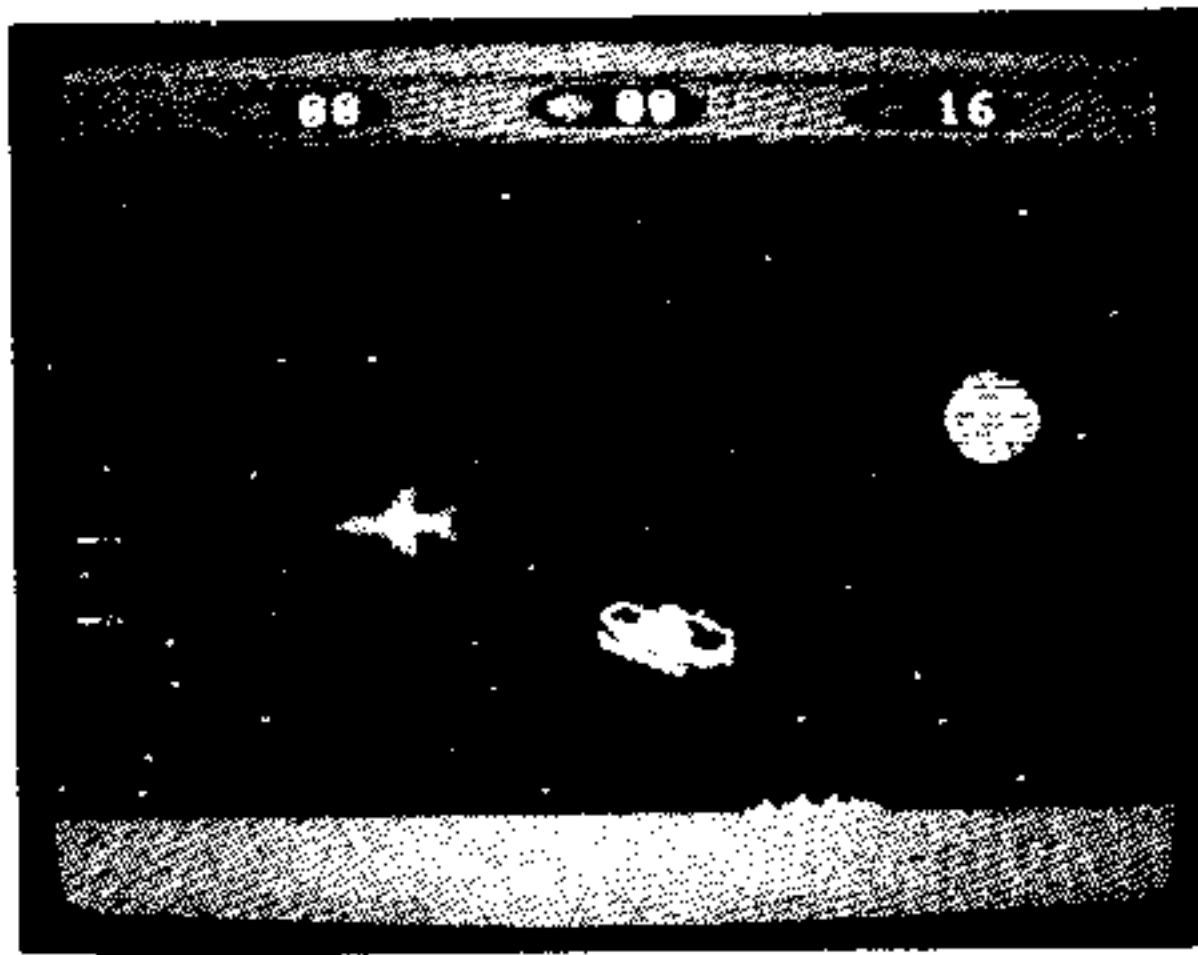
Broderbund Software/Creative Software. Shoot-'em-up/pick 'em-up. Your mission: As a pilot fly into enemy territory, blow holes in the walls of several prison barracks, pick up



STEP 1: Fly along, keeping the tail of your chopper midway up one side of the screen. A jet will soon head your way.

hostages, and make it back to an American base without getting shot down by the many tanks, jets, and homing devices along the way. (Hints for Apple, Commodore 64, VIC-20.)

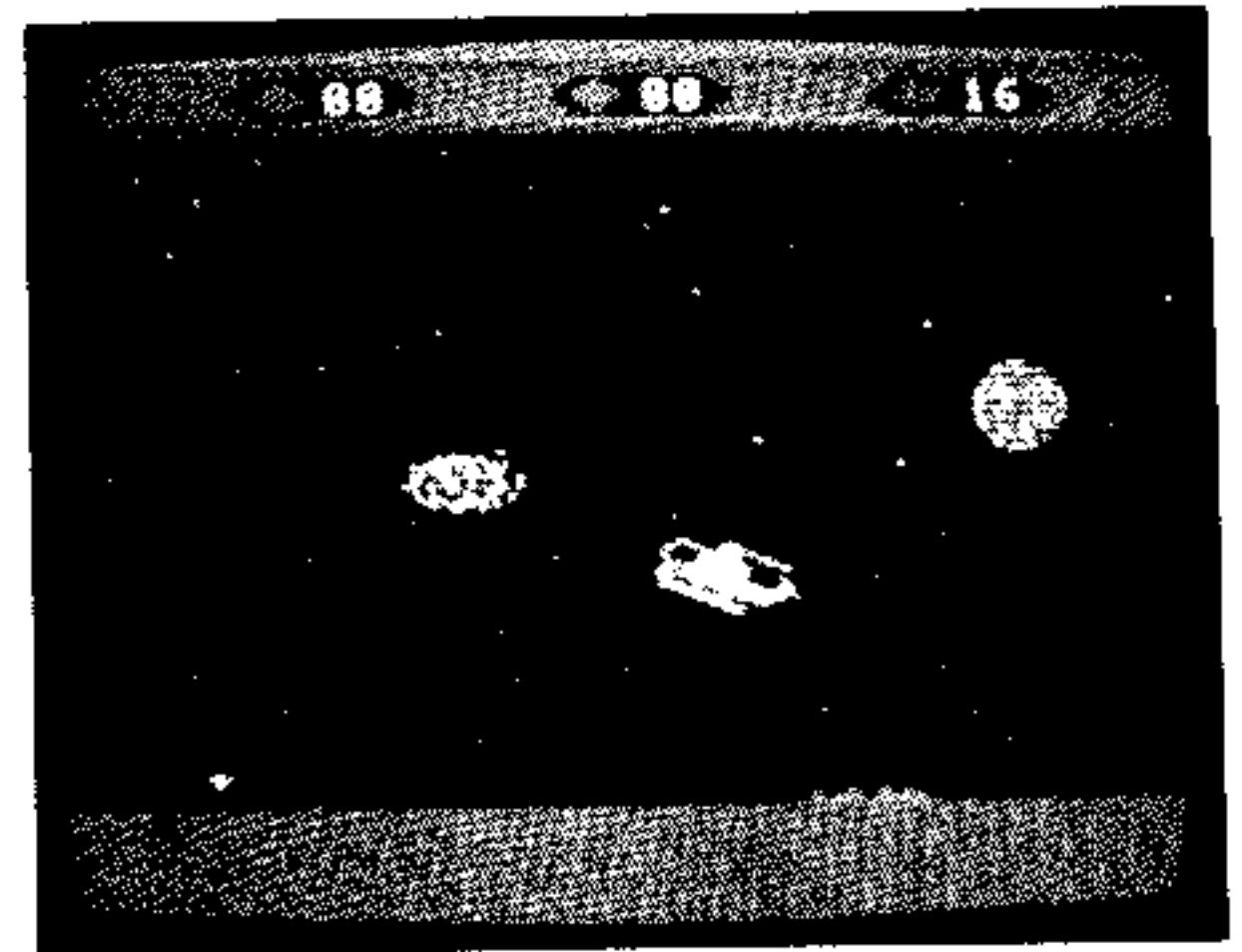
The pictures here show an ef-



STEP 2: When a jet appears, let up on the joystick so your chopper slows down. The jet will turn right in front of you.

fective way to shoot down all those missile-firing jets that harass you throughout the game.

So, good luck, Captain. You've got 64 desperate hostages counting on you. Don't let them down. —DL



STEP 3: As the jet pauses and turns away from you, shoot it down. After a little practice, this will become very easy.

H I N T H O T L I N E

Hints and game tip-offs are pouring into the K-POWER office! Keep 'em coming. Here are some of the hottest hints we've checked out, plus a few from our very own Special Ks! (Note: the computer system listed in brackets indicates the computer version(s) the hint works for.)

DEADLINE, Infocom (all). Text-adventure. Your mission: To solve a murder mystery in 12 hours.

🔑 Try rubbing the pad with another object, then carefully examine it. —JUNIL AHN, 13, R.P.V., California

🔑 Don't ignore the servants. Mrs. Rourke, in particular, is quite a gossip. —MARC WONTOREK, 15, Northford, Connecticut; GREG EAST, 14, Porter, Texas; JUNIL AHN, 13, R.P.V., California.

SKYFOX, Electronic Arts (Apple). Strategy/skill shoot-'em-up. Your mission: Use the super-modern jet fighter, Skyfox, to stop an invasion.

🔑 To access the 20th-century video game mentioned in the documentation, press CTL-G when you're at the computer located at home base. —RICHARD SMITH, 12, Honolulu, Hawaii

WIZARDRY, Sir-tech (Apple). Fantasy role-playing adventure. Your mission: To organize a band of hardy adventurers and set off to slay the evil arch-mage, Werdna.

🔑 Have your bishop camp out in the dungeon and "I"dentify item No. 9 until he's successful. Then go to the Adventurer's Inn, where you'll be in for a surprise! —ALAN CRAWTHER, 15, Waverly, Pennsylvania; CHRIS WEAKLY, 13, Fayetteville, North Carolina; MARK LI, 16, Mercer Island, Washington

RAID ON BUNGELING BAY, Broderbund (Commodore 64). Strategy/arcade game. Your mission: To destroy six enemy factories in the Bungeling empire.

🔑 A load of bombs lies in store at one of the enemy airports.

🔑 Go for the island with two factories first; then destroy the factories on islands with airports.

🔑 If one of your 'copters is about to blow up, aim it to crash into a factory. It'll do mucho damage. —THE SPECIAL KS

SPARE CHANGE, Broderbund (Apple). Humorous arcade game.

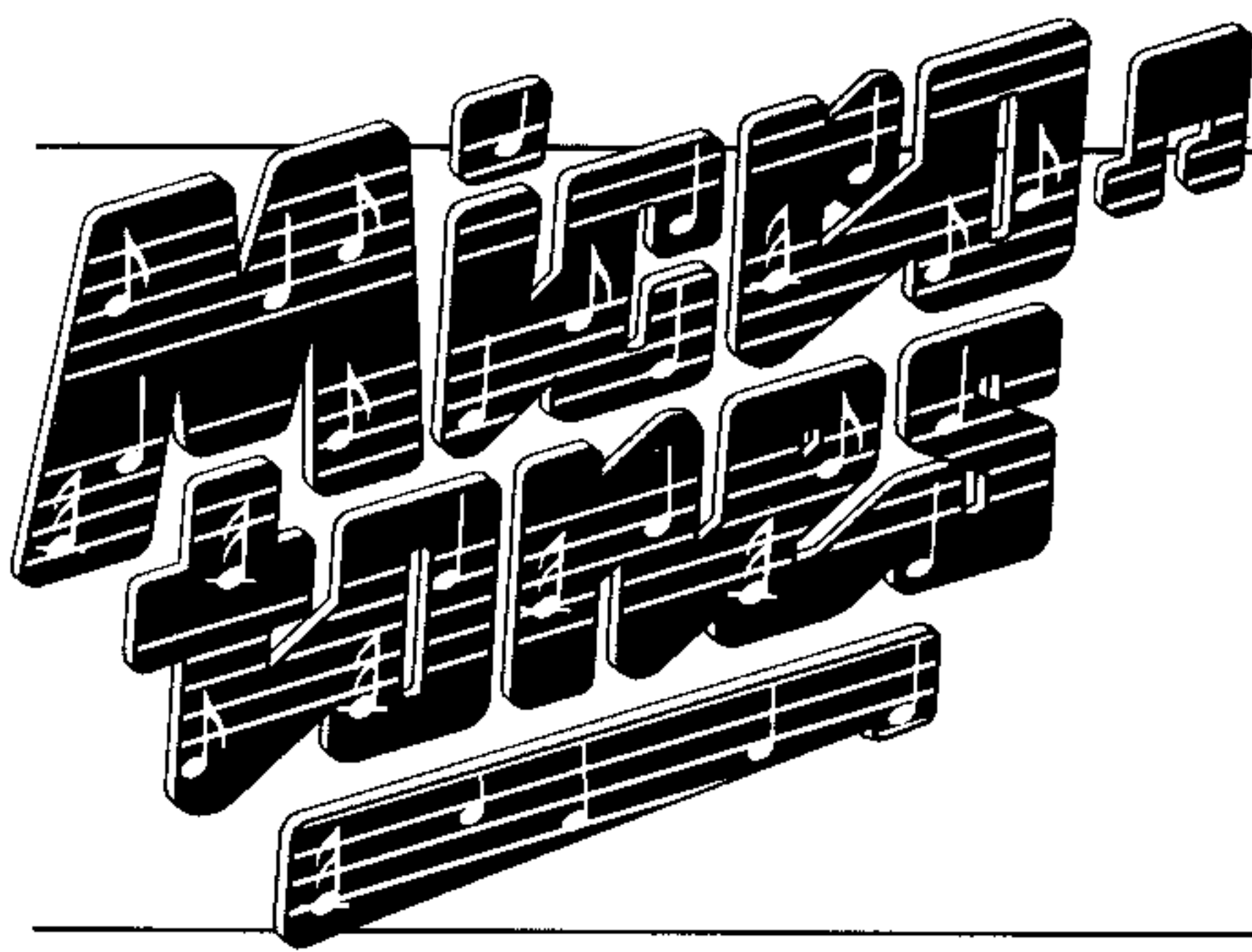
Your mission: To amass a fortune and prevent the greedy Zerks from filling their piggy banks.

🔑 When you're playing the game, press ESC. That will freeze the screen. Type exactly: ISLE.DRIVER. Don't press RETURN; the disk will automatically go into motion. You won't be able to see what you're typing, so type carefully. A cheat menu appears that will let you see all the games' cartoons and boards, among other things. —ROB JOHNSTON, 14, Ft. Washington, Maryland

LAST GLADIATOR, Electronic Arts (Apple). Strategy/arcade game. Your mission: To use a variety of weapons to slay as many monsters as possible.

🔑 Don't always destroy the dragon and robot. Use the net to hold them in place and help kill other oncoming nasties. —THE SPECIAL KS

Special thanks to the Special Ks: David Langendoen, 16; Damon Osgood, 16; Alex Shakar, 16—all from Brooklyn, New York. Hintmasters should send their tips to Hint Hotline, c/o K-POWER, 730 Broadway, New York, NY. K-POWER will pay \$10 for hints we haven't heard of.



MUSIC PROGRAMS BY JOEY LATIMER

Most of you computer maestros out there have discovered that your computer can play some great music. But did you know it can *compose* music, too? Well, it can. And this month's Microtones program, *Tune Generator*,



turns your computer into a songwriting machine. The program works by randomly selecting from a table of chords and associated notes. The *Tune Generator* makes compositions that range from downright folksy to airy and heavenly. Enjoy!



ADAM/TUNE GENERATOR

```

10 LOMEM: 29000
20 DIM chord(5,4),note(5,5,2)
30 HOME:PRINT TAB(9);"TUNE GENERATOR"
40 PRINT:PRINT "Please press <SPACE BAR> to"
50 PRINT "begin. Press <RETURN> to stop"
60 PRINT "the program."
70 IF PEEK(64885) <> 32 THEN 70
80 FOR x = 28000 TO 28005:READ a:POKE x,a:NEXT x
90 FOR x = 1 TO 5:READ chord(x,1),chord(x,2),chord(x,3),chord(x,4)
100 FOR y = 1 TO 5:READ note(x,y,1),note(x,y,2)
110 NEXT y:NEXT x
120 FOR q = 144 TO 208 STEP 32:POKE 28006,q:CALL 28000:NEXT q
130 t = INT(RND(1)*20)+20
140 FOR x = 1 TO t
150 r = INT(RND(1)*5)+1
160 IF x = 1 THEN r = 1
170 IF x = t THEN r = 4
180 FOR z = 1 TO 4
190 POKE 28006,chord(r,z):CALL 28000
200 NEXT z
210 FOR y = 1 TO 3:s = INT(RND(1)*5)+1

```

```

220 IF PEEK(64885) = 13 THEN FOR q = 159 TO 223 STEP 3
2:POKE 28006,q:CALL 28000:NEXT q:END
230 FOR z = 1 TO 2
240 POKE 28006,note(r,s,z):CALL 28000
250 NEXT z
260 FOR de = 1 TO 250:NEXT de:NEXT y:NEXT x
270 FOR q = 0 TO 15 STEP 0.1:FOR n = 144 TO 208 STEP 3
2
280 POKE 28006,n+q:CALL 28000
290 NEXT n:NEXT q
300 FOR q = 128 TO 192 STEP 32:POKE 28006,q:CALL 28000
310 POKE 28006,0:CALL 28000:NEXT q:GOTO 120
1000 DATA 58,102,109,211,255,201
2000 DATA 141,26,165,21,205,26,206,23,197,21,206,17
2010 DATA 205,26,129,20,175,15,193,20,206,17,207,15
2020 DATA 195,14,198,13,142,17,163,14,206,17,207,15
2030 DATA 195,14,198,13,207,11,143,15,166,13,207,15
2040 DATA 195,14,198,13,207,11,202,10,133,21,174,17
2050 DATA 206,17,197,21,195,14,202,10,207,8

```



ATARI/TUNE GENERATOR

```

10 DIM V0(5),V1(5),V2(5),N(5,5)
20 PRINT CHR$(125);" TUNE GENERATOR"
30 FOR X=1 TO 5:READ A,B,C
40 V0(X)=A:V1(X)=B:V2(X)=C
50 FOR Y=1 TO 5:READ NO
60 N(X,Y)=NO
70 NEXT Y:NEXT X
80 TI=INT(RND(1)*20)+10
90 FOR X=1 TO TI
100 R=INT(RND(1)*5)+1
110 IF X=1 THEN R=1
120 IF X=TI THEN R=3
130 SOUND 0,V0(R),10,4
140 SOUND 1,V1(R),14,4
150 SOUND 2,V2(R),10,4
160 FOR Y=1 TO 3:S=INT(RND(1)*5)+1
170 SOUND 3,N(R,S),10,4
180 FOR DE=1 TO 75:NEXT DE:NEXT Y:NEXT X
190 FOR Q=6 TO 0 STEP -0.15
200 SOUND 0,144,10,Q:SOUND 1,96,10,Q
210 SOUND 2,60,10,Q:SOUND 3,N(R,S),10,Q
220 NEXT Q:FOR DE=1 TO 120:NEXT DE:GOTO 80
1000 DATA 121,96,81,60,53,47,40,60
1010 DATA 91,72,60,45,81,72,64,121
1020 DATA 162,128,108,81,72,64,60,53
1030 DATA 144,96,60,72,64,60,53,47
1040 DATA 193,128,81,81,96,64,47,40

```



COMMODORE 64/TUNE GENERATOR

```

10 DIM H1(5),L1(5),H2(5),L2(5),NH(5,5),NL(5,5)
20 PRINT CHR$(147);TAB(13);"TUNE GENERATOR"
30 S=54272:FOR I=S TO S+24:POKE I,0:NEXT I
40 FOR X=1 TO 5:READ H1(X),L1(X),H2(X),L2(X)
50 FOR Y=1 TO 5:READ NH(X,Y),NL(X,Y):NEXT Y,X
60 POKE S+5,34:POKE S+6,243:POKE S+4,17
70 POKE S+12,34:POKE S+13,243:POKE S+11,17
80 POKE S+19,34:POKE S+20,243:POKE S+18,17
90 T=INT(RND(1)*20)+20
100 FOR Q=0 TO 10:POKE S+24,Q:NEXT Q

```



```

110 FOR X=1 TO T
120 R=INT(RND(1)*5)+1
130 IF X=1 THEN R=1
140 IF X=T THEN R=4
150 POKE S+1,H1(R):POKE S,L1(R)
160 POKE S+8,H2(R):POKE S+7,L2(R)
170 FOR Y=1 TO 3:SC=INT(RND(1)*5)+1
180 POKE S+15,NH(R,SC):POKE S+14,NL(R,SC)
190 FOR DE=1 TO 100:NEXT DE:NEXT Y,X
200 FOR Q=10 TO 0 STEP -.05:POKE S+24,Q:NEXT Q
210 FOR DE=1 TO 700:NEXT DE
220 FOR X=0 TO 1:POKE S+X,0:POKE S+7+X,0
230 POKE S+14+X,0:NEXT X:GOTO 90
1000 DATA 16,195,21,31,25,30,33,135,37,162,42,62,50,60
1010 DATA 22,96,28,49,25,30,28,49,31,165,33,135,44,193
1020 DATA 12,143,15,210,18,209,25,30,28,49,31,165,33
1030 DATA 135,14,24,16,195,28,49,31,165,33,135,37,162
1040 DATA 42,62,10,143,12,143,21,31,25,30,31,165,42
1050 DATA 62,50,60

```



TI-99/4A/TUNE GENERATOR

```

10 DIM V1(5),V2(5),N(5,5)
20 RANDOMIZE
30 CALL CLEAR
40 PRINT TAB(7);"TUNE GENERATOR"
50 FOR X=1 TO 5
60 READ V1(X),V2(X)
70 FOR Y=1 TO 5
80 READ N(X,Y)
90 NEXT Y
100 NEXT X
110 TI=INT(RND*20)+10
120 FOR X=1 TO TI
130 R=INT(RND*5)+1
140 IF (X<>1)*(X<>R) THEN 160
150 R=1-2*(X=R)
160 FOR Y=1 TO 3
170 S=INT(RND*5)+1
180 CALL SOUND(500,V1(R),1,V2(R),1,N(R,S),1)

```

```

190 NEXT Y
200 NEXT X
210 FOR Q=1 TO 30 STEP 5
220 CALL SOUND(500,V1(4),Q,V2(4),Q,N(R,S),Q)
230 NEXT Q
240 FOR DE=1 TO 600
250 NEXT DE
260 GOTO 110
1000 DATA 262,330,392,523,587,659,784
1010 DATA 349,440,392,440,494,523,698
1020 DATA 196,247,294,392,440,494,523
1030 DATA 220,262,440,494,523,587,659
1040 DATA 165,196,330,392,494,659,784

```



VIC-20/TUNE GENERATOR

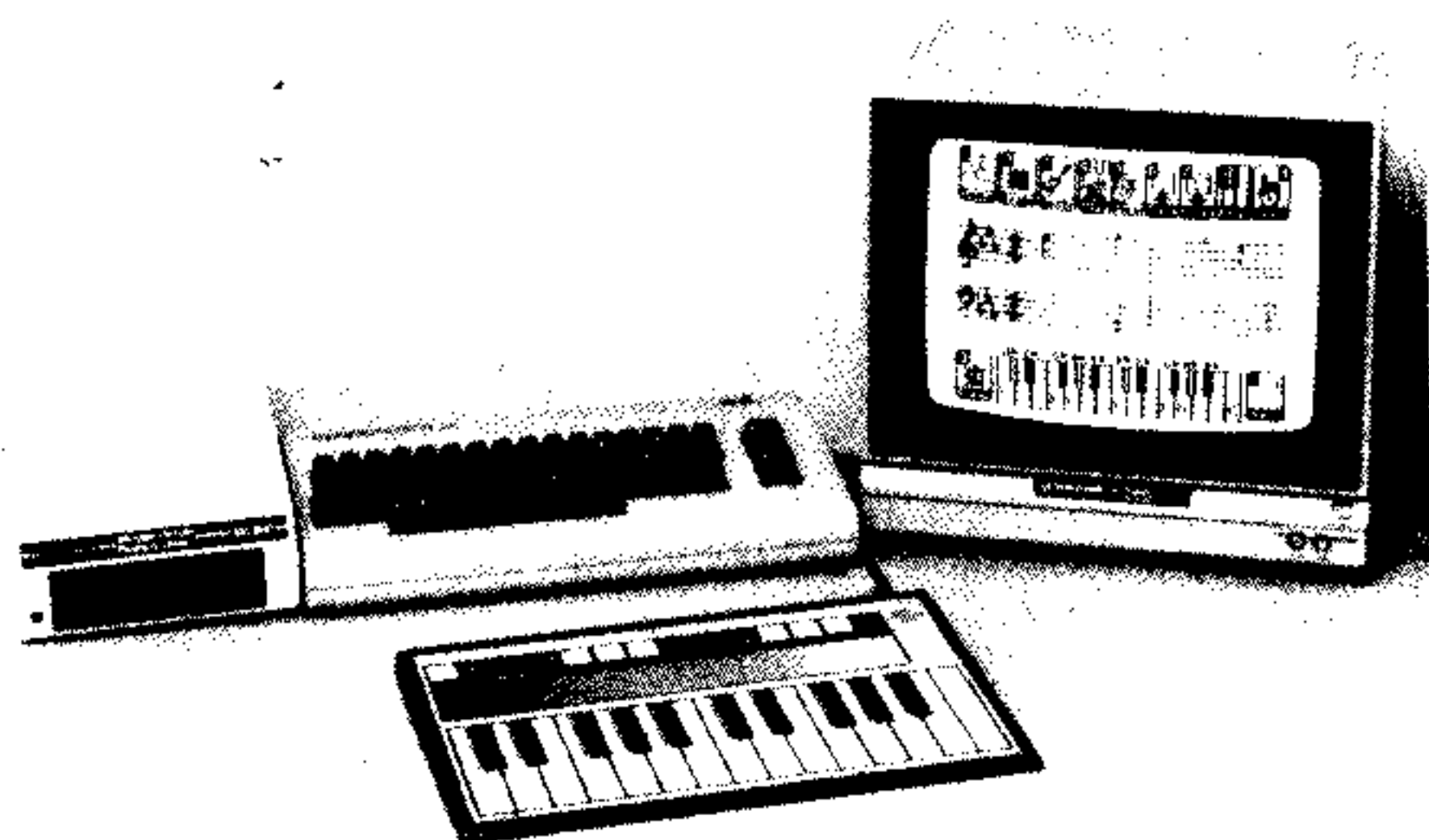
```

10 DIM V1(5),N(5,5)
20 PRINT CHR$(147);TAB(4);"TUNE GENERATOR"
30 FOR X=1 TO 5:READ V1(X)
40 FOR Y=1 TO 5:READ N(X,Y)
50 NEXT Y,X
60 FOR X=1 TO 5:POKE 36878,X:NEXT X
70 T=INT(RND(1)*20)+10
80 FOR X=1 TO T
90 R=INT(RND(1)*5)+1
100 IF X=1 OR X=T THEN R=1
110 POKE 36874,V1(R)
120 FOR Y=1 TO 3
130 S=INT(RND(1)*5+(X=T))+1
150 POKE 36876,N(R,S)
160 FOR DE=1 TO 175:NEXT DE,Y:NEXT X
170 FOR Q=4.9 TO 0 STEP -.05
180 POKE 36878,Q:NEXT Q
190 POKE 36874,0:POKE 36876,0
200 FOR DE=1 TO 1250:NEXT DE:GOTO 60
1000 DATA 225,215,225,228,231,235
1010 DATA 232,215,219,223,225,232
1020 DATA 235,215,219,223,225,228
1030 DATA 237,219,223,225,228,231
1040 DATA 231,207,215,223,231,235

```

M I C R O N O T E S

Finally, a keyboard for musical dummies! Brought to you from **Waveform**, the **ColorTone Keyboard** is a touch-sensitive membrane keyboard with 25 piano-like keys, a touch strip that performs as a musical harp, and 14 function keys. Says Tom McCreery Jr., Waveform prez, "The ColorTone Keyboard intros non-



Waveform's ColorTone Keyboard.

musicians to useful musical concepts and lets them have an exciting, creative experience without having to spend long hours of practice." The ColorTone Keyboard retails for \$79.95 and can be used alone or with Waveform's **MusiCalc** software. Waveform Corp., 1912 Bonita Way, Berkeley, CA 94704; (415) 841-9866.

Ready to turn your computer into a home entertainment center? **Sequential Circuits, Inc. (SCI)** might have the product for you. It's called the **Model 206 Six Voice Soundboard**, and costs less than \$300. Says SCI marketing manager Steve Salyer, it's aimed at that "giant market for an inexpensive module that can turn a personal computer into a personal orchestra." SCI, which makes the well-known **Prophet Synthesizer** used by the likes of the **Thompson Twins** and **Billy Joel**, claims the computer user with a Six Voice Soundboard can create trumpet, violin, organ, banjo, drum, bass, and electronic sound effects. For more info, contact Sequential Circuits, Inc., 3051 N. First St., San Jose, CA 95134; (408) 946-5240.

It wasn't long before computer gamemaking companies caught on to the trivia craze. This month my playtesters and I spent a weekend playing seven computerized Trivial Pursuit spinoffs. Most of them aren't really games at all, but simply timed countdown question-and-answer sessions. The worst of the lot only asked questions concerning "chic" subjects, and featured answers that were downright wrong. (Example: WHO WAS THE FIRST PRESIDENT TO GRADUATE FROM WEST POINT? Answer: ROBERT E. LEE.)

PQ: *The Party Quiz Game* is far and away the best of the computerized trivia games, but also the most expensive. Each of four players uses a special game controller (included in the package) to signal the answer to multiple-choice questions. Whoever answers correctly first, scores points. (You can also play a version in which all players who answer correctly score proportionally.) Bonus rounds help players even up the score, and a handicapping system makes for a little more balance between players of different skill levels.

An original, challenging game—the closest thing to being on College Bowl—this is the first that suitably converts trivia madness onto the computer. Good for ages 12 and up. The manufacturer plans to make additional question disks available in the future.

Of all the straightforward, timed question-and-answer programs, *Trivia 101*'s the best. Easy to learn, with a variety of topics from which to choose, this is an intelligent, exciting, intriguing, and enjoyable challenge. Designed for one to 14 players or teams, ages 12 and up, its only major drawback is the play system, which requires each player or team to press the space bar to stop the countdown timer. This can make it sort of crowded around the keyboard. An additional question disk is available.

There are a few things to keep in mind when sorting through the trivia programs on the market. 1) Can you purchase additional question disks? The questions in all the games we tested began to repeat themselves after a couple of hours of play. 2) Do you want a straightforward question-and-answer package or something with a play system all its own? 3) Are you interested in solo, individual, or team play?

—REVIEWS BY JAMES DELSON

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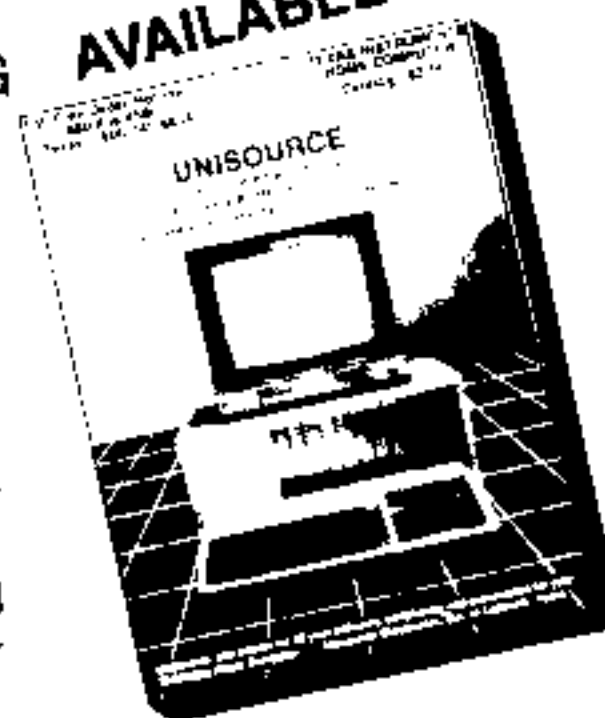
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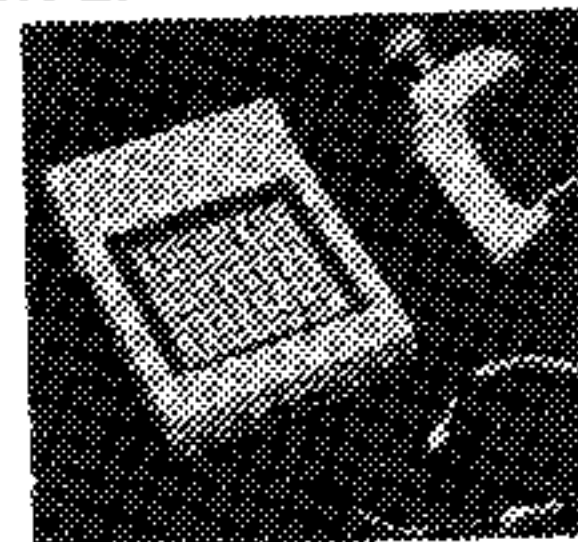
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