

PREVIEW: THE NEW
COMMODORE PLUS/4

FAMILY COMPUTING™



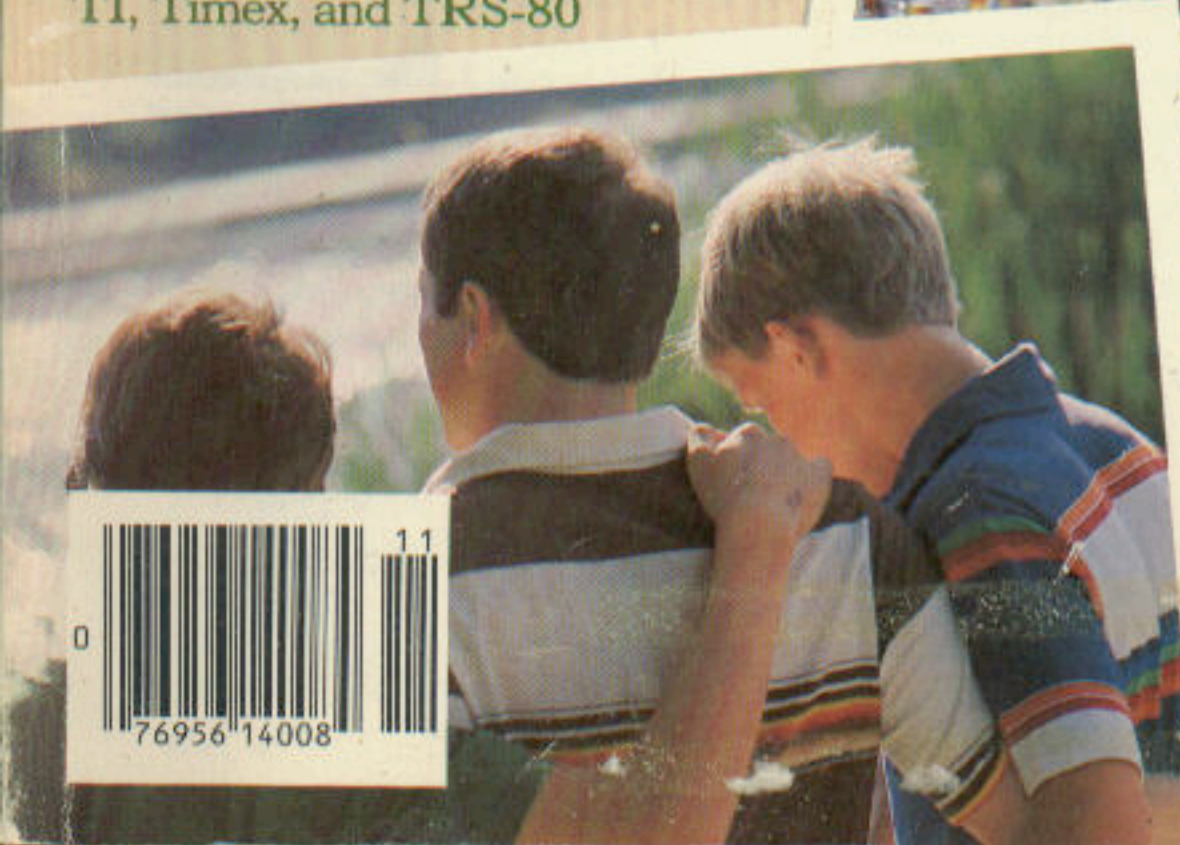
Life with *Bachelor* Father and His Computer: Saving Time and Money

Software to Challenge Your Children

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

Buyer's Guide to Monitors

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



FAMILY COMPUTING

FEATURES

51 LIFE WITH BACHELOR FATHER AND HIS COMPUTER

by Jon Patrick Harper

Learn how one 31-year-old single father uses his computer to manage his household—and life with his two adopted teenage sons.

PLUS: HOW I SELECTED MY COMPUTER

57 HOW TO MANAGE YOUR MONEY? GET ORGANIZED!

by Nick Sullivan

An interview with best-selling author Andrew Tobias, who has turned his financial know-how into a powerful money-management program.

60 SOFTWARE TO CHALLENGE YOUR CHILDREN

by Lynne Alper

Some of the best software around lets school-age children create worlds they can explore. Inside, we give you a rundown of some programs.

PLUS: WHAT'S FUN AND TEACHES TOO—THREE FAMILIES RUN THROUGH SOME OF THEIR FAVORITES

65 STARCARDS: THE SPORTING LIFE

by Bob Condor

Five top athletes reveal how computers helped them improve their performance in sports, school, and home-management skills.

68 BUYER'S GUIDE TO MONITORS

by Ken Coach

A look at monitors: Do you need one, and how do you pick one?

PLUS: CLOSE-UP—MORE THAN 50 COMPUTER MONITORS

71 COMPUTING "FAMILY OF THE YEAR" CONTEST

Is yours the computing family of the year? Find out how to enter our contest and win valuable prizes.

72 A PREVIEW OF THE COMMODORE PLUS/4

by Louis Wallace

A look at Commodore's latest entry into the microcomputer field—a 64K computer with built-in software that's suited for the home and for business.

PROGRAMMING

75 THE PROGRAMMER

76 AUTUMN PROGRAMS

by Joey Latimer

Print a personal note to tuck into this year's holiday card; and create a *Cornucopia* overflowing with fruits and vegetables.

94 PUZZLE

by Peter Favaro

The case of *The Missing Lapis Lazuli*.

100 READER-WRITTEN PROGRAM

Save time and hassle with the *Mailing List* program for the Apple computer.

PRODUCTS

106 WHAT'S IN STORE

Product announcements and reviews.

106 NEW HARDWARE ANNOUNCEMENTS

The latest in the field: Sinclair's 128K QL; Ensoniq's Drum-Key, which gives rhythm to your Apple; and enhancements for the IBM PCjr.

108 SOFTWARE GUIDE

114 SOFTWARE REVIEWS

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COVER PHOTOGRAPHS BY MARK ADAMS

DEPARTMENTS

4 EDITOR'S NOTE

8 LETTERS

10 BEHIND THE SCREENS

14 GAMES

by James Delson

Mixing business with pleasure: Games that test your finance- and resource-management skills.

18 HOME-SCHOOL CONNECTION

by Mindy Pantiel and Becky Petersen

Word processing for kids.

24 TELECOMPUTING

by Sarah Kortum

Romance via modem.

30 LEARNING LOGO

by Mindy Pantiel and Becky Petersen

Educating your turtle—defining, debugging, and saving. Part three of a six-part series.

34 HOME BUSINESS

By Mindy Pantiel and Becky Petersen

A husband-wife team combines her craft with his computer skills.

38 ON-LINE

Getting back to basics.

42 LIGHT TOUCH

Paradise Lost.

46 COMPUTING CLINIC

138 CLASSIFIED

140 ADVERTISERS' INDEX

Page 65

Page 68



HOME-SCHOOL CONNECTION

SOFTWARE FOR YOUNG WRITERS

WORD PROCESSORS:

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

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

STORY PROGRAMS:

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

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

TYPING SOFTWARE:

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

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

N/A Information not available at press time.

**SOFTWARE FOR THE
TI 99/4A
SATISFACTION GUARANTEED**

ALL PROGRAMS IN EXTENDED BASIC

TYPWRITER

**A 16K Word Processor
for Cassette or Disk**

(does not require 32K mem. exp.)

INCLUDES: Right Justify, complete text editing (arrow keys move cursor to screen location of text), printer formatting shown in on-screen text, auto-centering, tab, etc.

ANY PRINTER: T.I., Epson, Gemini, Prowriter, Okidata, MPI, Smith-Corona, Royal, Brothers, Seikosha, Alphacom, Radio Shack, IDS, GE, NEC, Diablo, Gorilla, Abati, etc.

ANY I/O PORT INTERFACE: T.I. RS232 card, Doryt, Axiom, Intellifec, Ultra-Comp, etc. Parallel or Serial data. (PIO, RS232, etc.)

SPECIAL PRINTER CONTROLS: CPI changes, Bold, Condensed, lines/inch, proportional, reverse line feeds, form feeds, etc. (depends on printer capabilities)

HOLDS 3000 CHARACTERS; PRINTS MULTIPLE PAGES WITH CONTINUOUS INPUT/PRINT
CASSETTE: \$32.00 DISKETTE: \$35.00

NAME-IT

**16K Mail List/Data Base
for Cassette or Disk**

Control & Print: labels, lists, files.

DISK: 250 records, 9 fields of 28 chrs. per record.

CASSETTE: 2500 chrs, 9 fields of 28 chrs.

FAST SORT: 250 records in 100 seconds!

INCLUDES: Search, Selective print, 7 Print formats for labels & lists (user modifiable), Pre-set, etc.

MAIL MERGE FILES USING TYPWRITER (cassette or disk) or TI-WRITER module.

CASSETTE: \$32.00 DISK: \$35.00

MASTER DISK FILE

A PERPETUAL DISK FILE

Insert disk into drive; it is catalogued and filed.

Up to 120 disks or 1100 programs per file.

Does not require memory expansion.

Use single or double sided disks (or mixed).

Single or multiple drives.

List on screen or printer in alphabetical order by program name or disk name.

SEARCH by disk or program name. Look-up time from a cold start in less than one minute; from a running start in 15-25 seconds.

Automatically up-dates old information.

Any printer: parallel or serial.

DISK ONLY — \$15.00

SCREEN/DUMP

Print the screen to an 8-dot addressable, 8 bit printer. Does not require memory expansion! Disk version is easy to use. Cassette version requires mild programming knowledge.

CASSETTE or DISK — \$12.00

GAMES

All Games Available on Cassette or Disk

DIABLO — 232 movable tracks on the screen at one time and an ever-advancing ball. Unique!

"Devilish . . ." BYTE MAGAZINE

"The graphics are quite superb and the best I have ever seen on the Texas computer."

COMPUTER & VIDEO GAMES

"...truly worth its \$19.95 price."

ENTHUSIAST '99

"PLAYABILITY: 10 . . ." THE BEST T.I. SOFTWARE Consumer Guide Editors)

"You'll be hooked." The SPRITE (newsletter)

CASSETTE or DISK — \$19.95

KONG	\$15.00
BOUNCER	\$15.00
ROMEO	\$15.00
ARTILLERY	\$ 9.95
FROGGY	\$ 9.95
EXTENDED BASEBALL.....	\$ 9.95
EXTENDED HANGMAN.....	\$ 9.95

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EXTENDED SOFTWARE CO.
11987 CEDARCREEK DRIVE
CINCINNATI, OH 45240
(513) 825-6645

HOME-SCHOOL CONNECTION

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

TRY, TRY AGAIN

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

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

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

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

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

AT-HOME USES

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

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

PICKING A WORD PROCESSOR

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

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

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

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

GIVE WORD PROCESSING A CHANCE

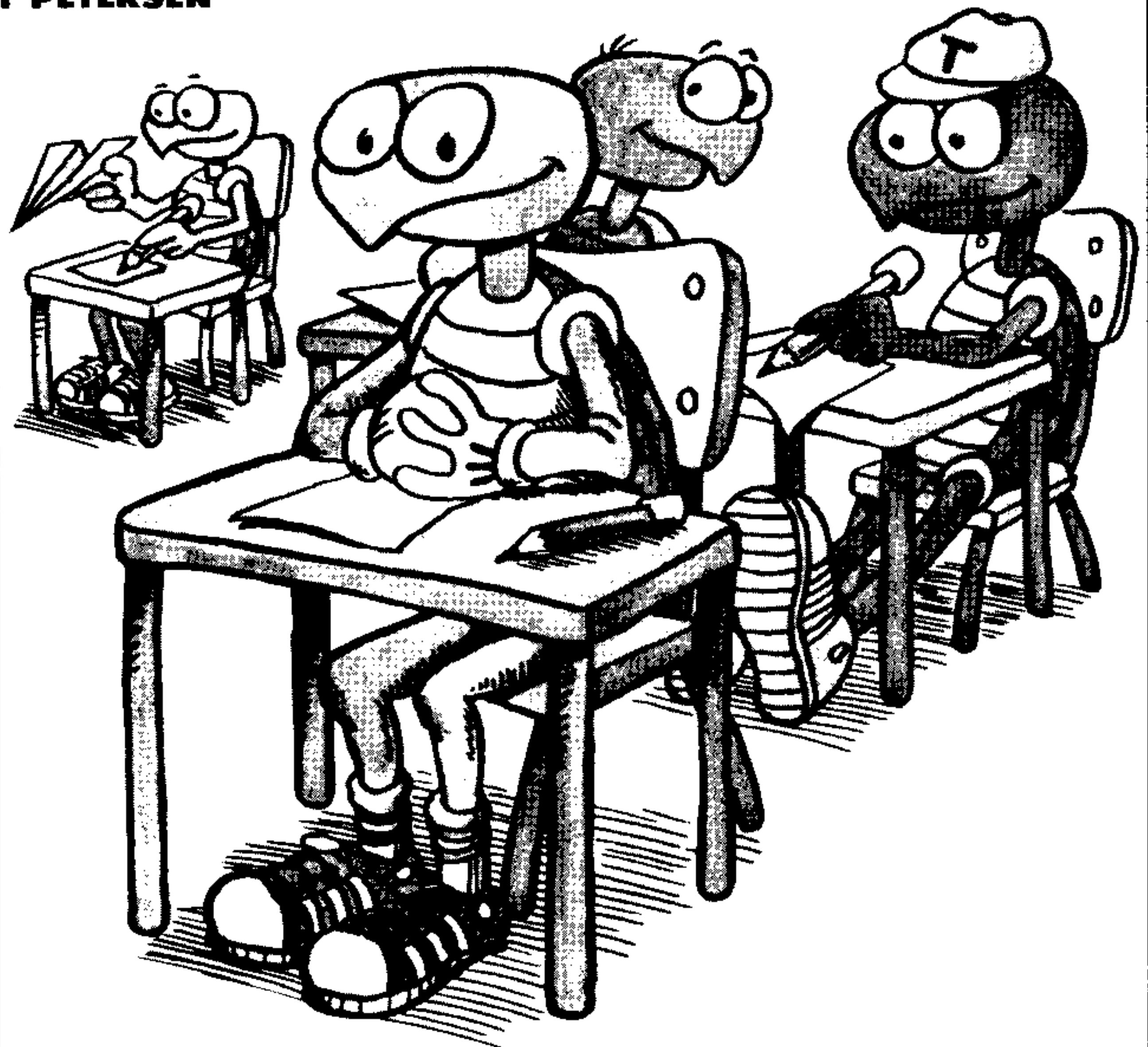
Writing has too often been treated as the weakest of the three Rs. This despite the fact that it's a useful skill in all subjects, and is a significant measurement of a person's ability to communicate logically. To write well, you must be willing to examine your work again and again. For the first time,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

LEARNING LOGO

EDUCATING YOUR TURTLE

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

BY MINDY PANTIEL AND BECKY PETERSEN



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

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

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

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

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

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

DEFINING PROCEDURES

Defining a procedure is a four-step process.

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

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

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

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

you'll be able to write your procedure.

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

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

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

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

LEARNING LOGO

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

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

EDIT THOSE BUGS

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

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

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

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

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

A PROBLEM-SOLVING TOOL

Parents, take note: Debugging is

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

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

THE FAMILY CHALLENGE

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

Family Member No. 1:

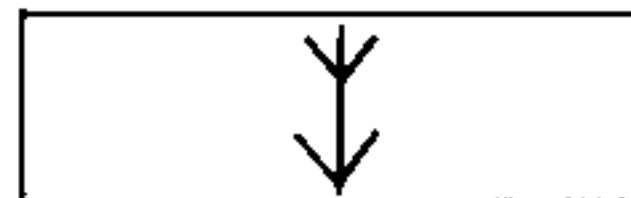
Write a procedure that makes this shape:



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

Family Member No. 2:

Write a procedure that makes this shape:



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

Family Member No. 3:

Write a procedure that makes this shape:



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

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

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

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

SAVE THAT PROCEDURE

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

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

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

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

MORE POWER TO LOGO

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

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

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

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

HOLIDAY UPDATE

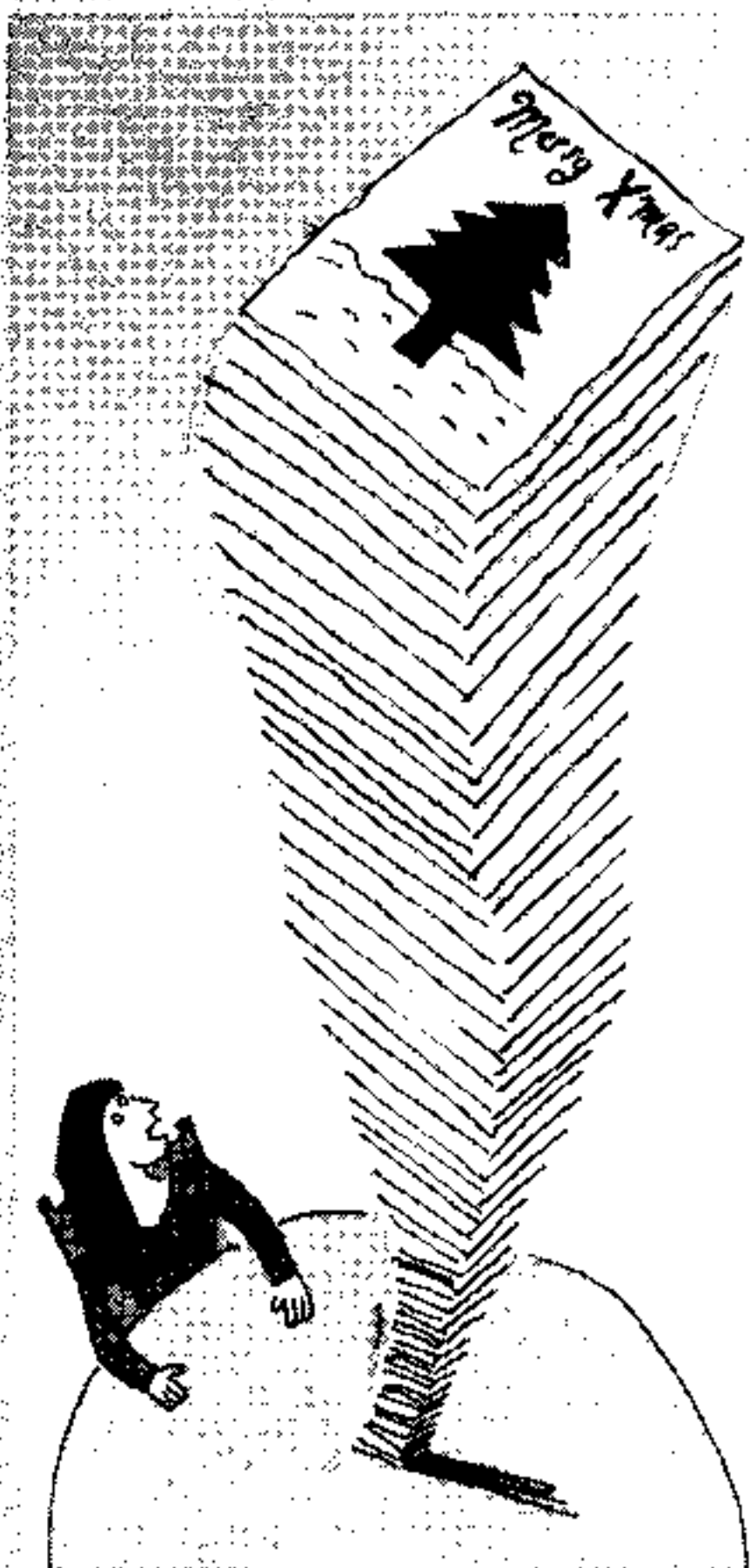
BY JOEY LATIMER

Christmas is just around the corner, but is your stack of unsigned cards still leaning over on your desk like the Tower of Pisa? Do you wring your hands and sigh as you wonder where you'll get the time to jot a personal note in each? After all, you haven't seen the Kendalls or the Smiths in over a year, and they'd love to hear what's new with your family.

Now your computer can help ease your workload with this personalized year-end summary note that can be inserted into your holiday card or mailed separately. All you have to do is hook up your printer, run the program, and enter some information.

Each member of your family (12 maximum) will be asked to input their most unusual, difficult, rewarding, and pleasurable experiences of 1984. Then you'll be asked to specify the holiday (Christmas, Chanukah, etc.) and, last of all, to type in the name of the note's recipient. Position your printer to start printing at the top of the page and press "P" to print the note. You can print as many copies as you wish, naming a new recipient each time. When you've finished, press "Q" to quit, and head for the nearest mailbox!

Version notes: As shown



here, *Holiday Update* will center your message vertically on standard 8½-inch × 11-inch paper, which is 66 lines deep. Depending on the number of lines in your message, you may be able to modify the program to use paper of a different length by changing the value of variable "s" (set initially to 66) in line 30. Try changing "s" to 48 so that the program works with 5-inch × 8-inch paper, or experiment with different settings of your own.

The TI-99/4A version of *Holiday Update* is set up to work with a parallel printer. If you have a serial printer, change line 590 to read OPEN #1: "RS232".

ADAM & Apple/Holiday Update

```

10 HOME
30 S = 66
40 PRINT "*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE QUESTIONS."
70 PRINT "PRESS <RETURN> AFTER"
80 PRINT "EACH REPLY."
90 PRINT
100 INPUT "WHAT IS YOUR LAST NAME?";NS
110 PRINT
120 PRINT "HOW MANY PEOPLE AND PETS ARE"
130 PRINT "IN THE ";NS;" FAMILY";
140 INPUT HM
150 IF HM > 12 THEN PRINT "I CAN ONLY HANDLE 12 NAMES"
    .":GOTO 110
    
```

```

160 DIM PS(HM),LS(HM,4)
170 PRINT
180 PRINT "ENTER THE NAME OF EACH"
190 PRINT NS;" FAMILY MEMBER. IF IT'S"
200 PRINT "A PET, BE SURE TO SAY"
210 PRINT "WHAT KIND (E.G., RAGS THE DOG)."

```

AUTUMN PROGRAMS

```
460 PRINT "(E.G., CHRISTMAS)?"
470 PRINT
480 PRINT "THE HOLIDAY IS ..."
490 INPUT HS
500 PRINT
510 PRINT "WHO IS THIS NOTE"
520 PRINT "FOR (E.G., DEBBIE,"
530 PRINT "SMITH FAMILY)?"
540 PRINT
550 INPUT FS
560 PRINT CHR$(147);
570 PRINT "WHEN YOUR PRINTER"
580 PRINT "IS READY, PLEASE"
590 PRINT "PRESS ANY KEY."
600 GET KS
610 IF KS="" THEN 600
620 OPEN 4,4
630 CMD4
640 FOR X=1 TO (S-14-HM*4)/2
650 PRINT
660 NEXT X
670 PRINT "DEAR ";FS;","
680 PRINT
690 PRINT "HERE'S A LIST TO TELL YOU MORE"
700 PRINT "OF WHAT WE DID IN '84:"
710 PRINT
720 PRINT
730 FOR T=1 TO 4
740 FOR X=1 TO HM
750 PRINT P$(X);" ";L$(X,T)
760 NEXT X,T
770 PRINT
780 PRINT
790 PRINT "HAVE A WONDERFUL ";HS;" HOLIDAY!"
800 PRINT
810 PRINT
820 PRINT "LOVE,"
830 PRINT
840 PRINT TAB(3);"THE ";NS;" FAMILY"
850 FOR X=1 TO (S-14-HM*4)/2
860 PRINT
870 NEXT X
880 PRINT#4
890 CLOSE 4
900 PRINT CHR$(147);
910 PRINT "PRESS <Q> TO QUIT"
920 PRINT "OR <P> TO PRINT"
930 PRINT "ANOTHER NOTE."
940 GET KS
950 IF KS="Q" THEN PRINT CHR$(147);:END
960 IF KS="P" THEN PRINT CHR$(147);:GOTO 510
970 GOTO 940
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

IBM PCs/Holiday Update

```
10 WIDTH 40
20 CLS
30 S=66
40 PRINT TAB(10);"*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE QUESTIONS."
70 PRINT "PRESS <ENTER> AFTER EACH REPLY."
80 PRINT
90 INPUT "WHAT IS YOUR LAST NAME";NS
100 PRINT
110 PRINT "HOW MANY PEOPLE AND PETS ARE IN THE"
120 PRINT NS;" FAMILY";
130 INPUT HM
140 IF HM>12 THEN PRINT "I CAN ONLY HANDLE 12 NAMES.":
GOTO 100
150 DIM P$(HM),L$(HM,4)
160 PRINT
170 PRINT "ENTER THE NAME OF EACH ";NS
180 PRINT "FAMILY MEMBER. IF IT'S A PET, BE SURE"
190 PRINT "TO SAY WHAT KIND (E.G., RAGS THE DOG).":
200 PRINT
```

```
210 FOR X=1 TO HM
220 PRINT NS;" #";X;
230 INPUT P$(X)
240 NEXT X
250 FOR T=1 TO 4
260 READ TS
270 FOR X=1 TO HM
280 CLS
290 PRINT "IN TWO SCREEN LINES OR LESS, DESCRIBE"
300 PRINT "THE MOST ";TS;" THING THAT ";P$(X)
310 PRINT "DID IN 1984. PRESS <ENTER> WHEN DONE."
320 PRINT
330 PRINT P$(X);" ";
340 INPUT L$(X,T)
350 NEXT X,T
360 CLS
370 PRINT "WHAT IS THE HOLIDAY"
380 PRINT "(E.G., CHRISTMAS)?"
390 PRINT
400 INPUT "THE HOLIDAY IS ";HS
410 PRINT
420 PRINT "WHO IS THIS NOTE FOR"
430 PRINT "(E.G., SMITH FAMILY, DEBBIE)?"
440 PRINT
450 INPUT FS
460 CLS
470 PRINT "WHEN PRINTER IS READY,"
480 PRINT "PLEASE PRESS ANY KEY."
490 K$=INKEY$
500 IF K$="" THEN 490
510 FOR X=1 TO (S-14-HM*4)/2
520 LPRINT
530 NEXT X
540 LPRINT "DEAR ";FS;","
550 LPRINT
560 LPRINT "HERE'S A LIST TO TELL YOU MORE"
570 LPRINT "OF WHAT WE DID IN '84:"
580 LPRINT
590 LPRINT
600 FOR T=1 TO 4
610 FOR X=1 TO HM
620 LPRINT P$(X);" ";L$(X,T)
630 NEXT X,T
640 LPRINT
650 LPRINT
660 LPRINT "HAVE A WONDERFUL ";HS;" HOLIDAY!"
670 LPRINT
680 LPRINT
690 LPRINT "LOVE,"
700 LPRINT
710 LPRINT TAB(3);"THE ";NS;" FAMILY"
720 FOR X=1 TO (S-14-HM*4)/2
730 LPRINT
740 NEXT X
750 CLS
760 PRINT "PRESS <Q> TO QUIT"
770 PRINT "OR <P> TO PRINT ANOTHER NOTE."
780 K$=INKEY$
790 IF K$="Q" OR K$="q" THEN CLS:END
800 IF K$="P" OR K$="p" THEN CLS:GOTO 420
810 GOTO 780
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

TI-99/4A/Holiday Update

```
10 CALL CLEAR
20 DIM P$(12),L$(12,4)
30 S=66
40 PRINT TAB(6);"*HOLIDAY UPDATE*"
50 PRINT
60 PRINT "PLEASE ANSWER THE"
70 PRINT "QUESTIONS. PRESS <ENTER>"
80 PRINT "AFTER EACH REPLY."
90 PRINT
100 PRINT "WHAT IS YOUR"
110 INPUT "LAST NAME? ";NS
120 PRINT
```


AUTUMN PROGRAMS

```
130 PRINT "HOW MANY PEOPLE AND"
140 PRINT "PETS ARE IN THE"
150 PRINT N$;" FAMILY";
160 INPUT HM
170 IF HM<=12 THEN 200
180 PRINT "I CAN ONLY HANDLE 12 NAMES."
190 GOTO 120
200 PRINT
210 PRINT "ENTER THE NAME OF EACH"
220 PRINT "FAMILY MEMBER. IF IT'S A"
230 PRINT "PET, BE SURE TO SAY WHAT"
240 PRINT "KIND (E.G., RAGS THE DOG)."
```

```
890 CALL KEY(3,K,ST)
900 IF (K=81)+(K=113)THEN 940
910 IF (K<>80)*(K<>112)THEN 890
920 CALL CLEAR
930 GOTO 500
940 CALL CLEAR
950 END
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Holiday Update

```
30 LET S=66
40 DIM T$(4,11)
50 LET T$(1)="UNUSUAL"
60 LET T$(2)="DIFFICULT"
70 LET T$(3)="REWARDING"
80 LET T$(4)="PLEASURABLE"
90 PRINT TAB 8;"*HOLIDAY UPDATE*"
100 PRINT
110 PRINT "PLEASE ANSWER THE QUESTIONS."
120 PRINT "PRESS <ENTER> AFTER EACH REPLY."
130 PRINT
140 PRINT "WHAT IS YOUR LAST NAME?"
150 INPUT N$
160 PRINT
170 PRINT "HOW MANY PEOPLE AND PETS ARE"
180 PRINT "IN THE ";N$;" FAMILY?"
190 INPUT HM
200 IF HM<=12 THEN GOTO 230
210 PRINT "I CAN ONLY HANDLE 12 NAMES."
220 GOTO 160
230 DIM P$(HM,20)
240 DIM L$(HM,4,80)
250 LET S=(S-15-HM*4)/2
260 CLS
270 PRINT "ENTER THE NAME OF EACH"
280 PRINT N$;" FAMILY MEMBER. IF IT"
290 PRINT "IS A PET, BE SURE TO SAY WHAT"
300 PRINT "KIND (E.G., RAGS THE DOG)."
```

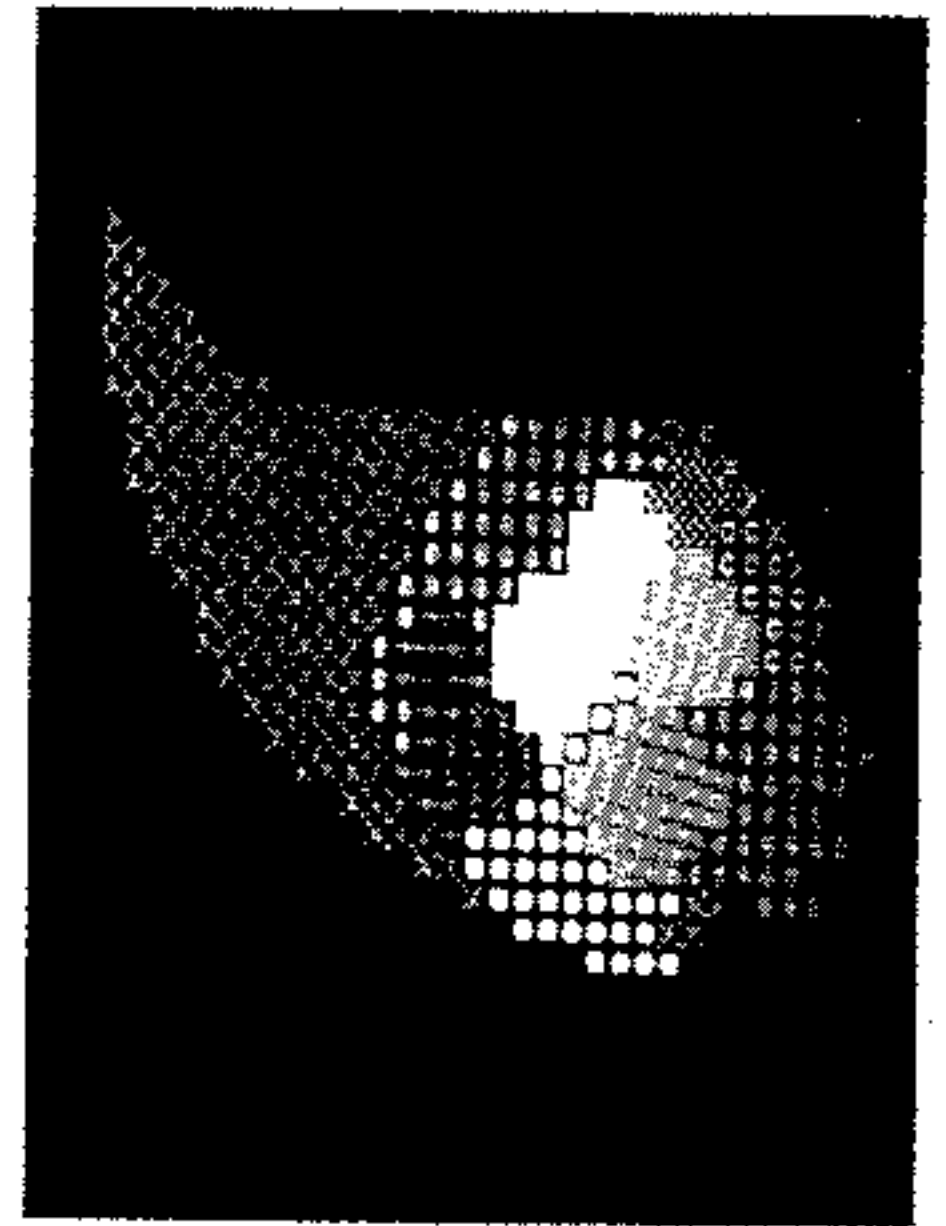
AUTUMN PROGRAMS

```
IF IT'S"
160 PRINT "A PET, BE SURE TO SAY WHAT KIND (E.G., RAGS
THE DOG)."
170 PRINT
180 FOR X=1 TO HM
190 PRINT NS;" #";X;
200 INPUT PS(X)
210 NEXT X
220 FOR T=1 TO 4
230 READ TS
240 FOR X=1 TO HM
250 CLS
260 PRINT "IN ONE SCREEN LINE OR LESS, DESCRIBE THE MO
ST ";TS
270 PRINT "THING THAT ";PS(X);" DID IN 1984. PRESS <E
NTER> WHEN DONE."
280 PRINT
290 PRINT PS(X);" ";
300 INPUT LS(X,T)
310 NEXT X,T
320 CLS
330 PRINT "WHAT IS THE HOLIDAY (E.G., CHRISTMAS)?"
340 PRINT
350 INPUT "THE HOLIDAY IS ";HS
360 PRINT
370 INPUT "WHO IS THIS NOTE FOR (E.G., SMITH FAMILY, D
EBBIE)";FS
380 CLS
390 PRINT "WHEN YOUR PRINTER IS READY, PLEASE PRESS AN
Y KEY."
400 KS=INKEY$
410 IF KS="" THEN 400
420 FOR X=1 TO (S-14-HM*4)/2
430 LPRINT
440 NEXT X
450 LPRINT "DEAR ";FS;" ,"
460 LPRINT
470 LPRINT "HERE'S A LIST TO TELL YOU MORE"
480 LPRINT "OF WHAT WE DID IN '84:"
490 LPRINT
500 LPRINT
510 FOR T=1 TO 4
520 FOR X=1 TO HM
530 LPRINT PS(X);" ";LS(X,T)
540 NEXT X,T
550 LPRINT
560 LPRINT
570 LPRINT "HAVE A WONDERFUL ";HS;" HOLIDAY!"
580 LPRINT
590 LPRINT
600 LPRINT "LOVE,"
610 LPRINT
620 LPRINT TAB(3);"THE ";NS;" FAMILY"
630 FOR X=1 TO (S-14-HM*4)/2
640 LPRINT
650 NEXT X
660 CLS
670 PRINT "PRESS <Q> TO QUIT OR <P> TO PRINT ANOTHER N
OTE."
680 KS=INKEY$
690 IF KS="q" OR KS="Q" THEN CLS:END
700 IF KS="p" OR KS="P" THEN CLS:GOTO 370
710 GOTO 680
1000 DATA UNUSUAL,DIFFICULT,REWARDING,PLEASURABLE
```

CORNUCOPIA

BY JOEY LATIMER

While you're decorating the house this Thanksgiving in preparation for the relatives' arrival, don't overlook your computer! After you've hung the dried corn ears on the front door and created a table centerpiece of pumpkins and gourds, RUN this program and watch that age-old symbol of abundance, the cornucopia, appear on your screen, overflowing with autumn fruits and vegetables!



Commodore 64 version of Cornucopia.

ADAM & Apple/Cornucopia

```
9 REM --CLEAR SCREEN AND SET FOR GRAPHICS--
10 HOME
20 GR
29 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
30 FOR X = 1 TO 10
40 READ KO,F,T
50 COLOR= KO
60 FOR RO = F TO T
70 READ A,B
80 HLINE A,B AT RO
90 NEXT RO,X
99 REM --DRAW DETAILED AND IRREGULAR PARTS--
100 FOR X = 1 TO 3
110 READ KO,T
120 COLOR= KO
130 FOR Y = 1 TO T
140 READ CO,RO
150 PLOT CO,RO
160 NEXT Y,X
170 GOTO 170
1000 DATA 13,1,33,3,3,3,4,3,5,3,6,3,7,3,8,3,9
1010 DATA 3,10,4,11,4,12,4,14,4,17,4,26,5,27
1020 DATA 5,28,5,29,6,30,6,31,7,31,7,32,7,32
1030 DATA 8,32,8,32,9,32,9,32,10,31,10,31,11,31
1040 DATA 12,17,13,17,15,17,16,19,18,26
1050 DATA 1,14,34,21,23,20,22,19,22,18,21
1060 DATA 17,19,17,18,16,17,16,17,16,23
1070 DATA 16,23,16,24,16,24,17,25,17,26
1080 DATA 17,26,18,26,18,26,18,25,20,25
1090 DATA 21,24,22,23
1100 DATA 12,14,22,24,26,23,27,23,28,22,29
1110 DATA 22,28,23,27,24,28,24,27,24,25
1120 DATA 3,20,35,31,31,28,31,26,31,24,31
1130 DATA 25,31,25,31,26,30,27,30,27,30
1140 DATA 27,31,27,32,26,31,26,32,27,31,28,30
1150 DATA 29,29,11,18,23,20,21,19,22,18,23,18,23,19
1160 DATA 22,20,21,3,24,26,18,19,17,20,18,19
1170 DATA 13,16,19,25,26,24,27,24,27,25,26
1180 DATA 11,18,20,29,30,28,30,29,30
1190 DATA 9,22,25,27,28,26,29,26,29,27,28
1200 DATA 12,26,31,22,24,21,25,21,25,21,25,22
1210 DATA 24,23,23,2,21,27,27,29,28,27,29,28
1220 DATA 30,30,30,26,31,31,31,28,32,30,33
1230 DATA 33,33,28,34,31,35,29,21,31,21,24
1240 DATA 23,30,23,25,25,31,25,29,26,33,36,28,37
1250 DATA 3,5,35,35,27,36,32,36,30,37,32,38
1260 DATA 9,13,17,27,18,29,20,29,19,31,21,30
1270 DATA 21,32,23,33,22,34,24,35,23,36,21,36
1280 DATA 25,37,16,23
```

AUTUMN PROGRAMS

Atari/Cornucopia

```
9 REM --RESERVE SPACE IN HIGH MEMORY--
10 S=(PEEK(106)-4)*256
20 POKE 106,S/256
30 GRAPHICS 17
39 REM --REDEFINE CHARACTERS A THROUGH I--
40 FOR X=S+264 TO S+335
50 READ SH
60 POKE X,SH
70 NEXT X
79 REM --RESET CHARACTER SET POINTER--
80 POKE 756,S/256
89 REM --MAIN DRAWING LOOP--
90 FOR X=1 TO 20
100 READ KO,F,T
110 COLOR KO
120 FOR RO=F TO T
130 READ A,B
140 PLOT A,RO
150 DRAWTO B,RO
160 NEXT RO
170 NEXT X
179 REM --WAIT FOR KEYPRESS--
180 POKE 764,255
189 REM --IF KEY IS PRESSED, RETURN SYSTEM TO NORMAL--
190 IF PEEK(764)<>255 THEN POKE 756,224:GRAPHICS 0:END
200 GOTO 190
1000 DATA 197,231,125,60,60,125,231,197,0,60,126,126
1010 DATA 126,126,60,0,60,126,255,255,255,255,126,60
1020 DATA 168,1,148,33,148,1,84,34,3,15,31,63,127,127
1030 DATA 255,255,192,240,248,252,254,254,255,255,255
1040 DATA 255,127,127,63,31,15,3,255,255,254,254,252
1050 DATA 248,240,192,255,255,255,255,255,255,255
1060 DATA 65,0,22,0,0,0,1,0,2,0,3,0,4,1,5,1,13,1,14,2
1070 DATA 15,2,16,2,16,2,17,3,17,3,17,4,17,4,17,5,17
1080 DATA 5,17,6,17,6,7,7,7,8,15,11,12,226,11,23,14
1090 DATA 14,13,14,13,16,13,15,13,14,8,8,8,8,8,9,8,10
1100 DATA 8,13,9,14,13,14,14,15,194,7,23,11,11,10,11
1110 DATA 10,11,9,13,8,13,8,11,8,8,8,8,8,8,8,9,12
1120 DATA 10,12,10,15,14,16,15,17,15,17,17,18,99,8,23
1130 DATA 14,14,14,15,14,15,15,16,15,16,15,15,16,16
1140 DATA 15,16,16,16,16,16,15,17,16,17,17,17,9,10,10
1150 DATA 10,11,11,68,12,23,12,12,11,12,11,12,11,13
1160 DATA 11,12,10,11,10,10,10,10,9,9,9,10,9,10,10,11
1170 DATA 233,8,8,12,13,105,13,15,9,10,9,10,9,10,73
1180 DATA 16,18,14,14,13,15,14,14,229,7,7,12,12,101
1190 DATA 12,12,9,9,69,16,16,13,13,230,7,7,13,13,102
1200 DATA 12,12,10,10,70,16,16,15,15,231,9,9,12,12
1210 DATA 103,16,16,9,9,71,18,18,13,13,232,9,9,13,13
1220 DATA 104,16,16,10,10,72,18,18,15,15
```

Commodore 64/Cornucopia

```
10 PRINT CHR$(147);
19 REM --SET SCREEN BORDER AND BACKGROUND TO BLACK--
20 POKE 53280,0
30 POKE 53281,0
39 REM --MAIN DRAWING LOOP--
40 FOR X=1 TO 13
50 READ CH,KO,F,T
60 FOR RO=F TO T
70 READ A,B
80 FOR CO=A TO B
89 REM --POKE SCREEN WITH CHARACTER--
90 POKE 1024+CO+40*RO,CH
99 REM --POKE COLOR MEMORY WITH COLOR--
100 POKE 55296+CO+40*RO,KO
110 NEXT CO,RO,X
120 GOTO 120
1000 DATA 86,9,1,23,3,3,3,4,3,5,3,6,3,7,3,9,4
1010 DATA 27,4,28,4,29,5,30,5,31,6,32,7,32,7
1020 DATA 32,8,32,9,13,10,14,11,14,13,15,14
1030 DATA 16,16,17,18,28,26,27,81,4,7,17,19
1040 DATA 23,18,22,17,22,16,21,16,21,15,19,15,18,14
1050 DATA 14,14,14,14,15,15,15,81,13,15,24,24,24,23
```

```
1060 DATA 23,22,22,21,21,20,21,18,22,18,23,19,26,20
1070 DATA 25,23,26,81,4,15,22,29,31,27,33,28,34,29
1080 DATA 33,29,32,28,33,27,31,30,32
1090 DATA 160,7,9,12,23,24,22,25,22,25,23,24
1100 DATA 160,5,12,17,20,22,19,23,19,23,19,23,20
1110 DATA 22,21,21,102,14,8,10,26,27,25,28,26,27
1120 DATA 160,8,11,15,26,27,25,28,24,29,24,29,25,28
1130 DATA 160,2,16,21,24,26,23,27,22,28,22,28,23,27
1140 DATA 24,26,87,6,10,14,28,29,28,30,29,31,30,31
1150 DATA 30,31,88,6,16,19,18,19,17,20,17,20,18,19
1160 DATA 42,2,13,20,16,17,15,18,15,18,16,17
1170 DATA 16,16,15,16,16,17,17,17
1180 DATA 90,10,7,8,24,24,23,25
```

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

```
9 REM --SET SCREEN WIDTH AND ENABLE COLOR BURST--
10 WIDTH 40
20 SCREEN 0,1
29 REM --CLEAR SCREEN AND SET TO BLACK--
30 KEY OFF
40 COLOR 0,0
50 CLS
60 LOCATE ,,0
70 FOR X=1 TO 13
79 REM --MAIN DRAWING LOOP--
80 READ CH,KO,F,T
90 COLOR KO
100 FOR RO=F TO T
110 READ A,B
120 FOR CO=A TO B
130 LOCATE RO,CO
140 PRINT CHR$(CH);
150 NEXT CO,RO,X
160 GOTO 160
1000 DATA 88,6,1,23,3,3,3,4,3,5,3,6,3,7,3,9,4
1010 DATA 27,4,28,4,29,5,30,5,31,6,32,7,32,7
1020 DATA 32,8,32,9,13,10,14,11,14,13,15,14,16
1030 DATA 16,17,18,28,26,27,3,5,7,17,19,23,18
1040 DATA 22,17,22,16,21,16,21,15,19,15,18,14
1050 DATA 14,14,14,14,15,15,15,3,10,15,24,24
1060 DATA 24,23,23,22,22,21,21,20,21,18,22,18
1070 DATA 23,19,26,20,25,23,26,3,5,15,22,29,31
1080 DATA 27,33,28,34,29,33,29,32,28,33,27,31
1090 DATA 30,32,219,14,9,12,23,24,22,25,22,25
1100 DATA 23,24,219,2,12,17,20,22,19,23,19,23
1110 DATA 19,23,20,22,21,21,176,1,8,10,26,27
1120 DATA 25,28,26,27,219,12,11,15,26,27,25,28
1130 DATA 24,29,24,29,25,28,219,4,16,21,24,26
1140 DATA 23,27,22,28,22,28,23,27,24,26,79,1
1150 DATA 10,14,28,29,28,30,29,31,30,31,30,31
1160 DATA 5,1,16,19,18,19,17,20,17,20,18,19,42
1170 DATA 4,13,20,16,17,15,18,15,18,16,17,16
1180 DATA 16,15,16,16,17,17,17,4,12,7,8,24,24
1190 DATA 23,25
```

Ti-99/4A/Cornucopia

```
9 REM --CLEAR SCREEN AND SET BACKGROUND COLOR--
10 CALL CLEAR
20 CALL SCREEN(2)
29 REM --DEFINE 14 SPECIAL CHARACTERS--
30 FOR X=1 TO 14
40 READ SH$,CH,SE,KF,KB
50 CALL CHAR(CH,SH$)
60 CALL COLOR(SE,KF,KB)
70 NEXT X
79 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
80 FOR X=1 TO 4
90 READ CH,F,T
100 FOR RO=F TO T
110 READ CO,EX
120 CALL HCHAR(RO,CO,CH,EX)
```

AUTUMN PROGRAMS

```

130 NEXT RO
140 NEXT X
149 REM --DRAW DETAILED AND IRREGULAR PARTS--
150 FOR X=1 TO 36
160 READ CH,RO,CO
170 CALL HCHAR(RO,CO,CH)
180 NEXT X
190 GOTO 190
1000 DATA A801942194015422,96,9,6,1
1010 DATA 003C7E7E7E7E3C00,104,10,4,1
1020 DATA 003C7E7E7E7E3C00,112,11,14,1
1030 DATA C5E77D3C3C7DE7C5,120,12,12,1
1040 DATA 030F1F3F7F7FFFFF,128,13,11,1
1050 DATA C0F0F8FCFEFEFFFF,136,14,11,1
1060 DATA FFFF7F7F3F1F0F03,144,15,11,1
1070 DATA FFFFFFFEFCF8F0C0,152,16,11,1
1080 DATA FFFFFFFFFFFFFFFFFF,95,8,11,1
1090 DATA 030F1F3F7F7FFFFF,39,1,7,1
1100 DATA C0F0F8FCFEFEFFFF,47,2,7,1
1110 DATA FFFF7F7F3F1F0F03,55,3,7,1
1120 DATA FFFFFFFEFCF8F0C0,63,4,7,1
1130 DATA FFFFFFFFFFFFFFFFFF,64,5,7,1
2000 DATA 120,2,22,3,1,3,2,3,3,3,4,3,5,3,8,4,20
2010 DATA 4,21,4,22,5,22,5,23,6,23,7,22,7,22,8
2020 DATA 21,9,20,10,14,11,3,13,2,14,1,15,7
2030 DATA 104,9,24,15,4,14,3,13,5,13,3,13,3
2040 DATA 13,4,13,4,13,5,13,2,14,2,14,1,15,1
2050 DATA 15,5,17,3,18,3,20,2,96,10,23,17,2,18
2060 DATA 2,18,1,18,2,17,5,17,4,18,9,17,9
2070 DATA 16,10,15,9,16,9,20,6,22,4,24,2,112,9
2080 DATA 23,19,5,19,6,20,6,19,8,20,8,22,6,26
2090 DATA 2,27,1,26,2,25,4,23,6,24,4,26,2
2100 DATA 26,3,27,3,39,10,20,64,10,21,47
2110 DATA 10,22,64,11,20,64,11,21,64,11,22
2120 DATA 55,12,20,64,12,21,63,12,22,39,18,17
2130 DATA 64,18,18,47,18,19,64,19,17,64,19,18
2140 DATA 64,19,19,55,20,17,64,20,18,63,20,19
2150 DATA 128,12,16,136,12,17,144,13,16,152,13,17,128
2160 DATA 16,15,136,16,16,144,17,15,152,17,16,128,15
2170 DATA 21,95,15,22,95,15,23,95,15,24,136,15,25,144
2180 DATA 16,21,95,16,22,95,16,23,95,16,24,152,16,25

```

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

```

9 REM --D$ CONTAINS PICTURE DATA--
10 LET D$="136,1,19,2,2,2,3,2,4,2,5,3,6,3,8,3,10,4,22,
4,23,4,24,5,25,5,25,6,25,7,25,8,25,9,25,10,15,12,16,14,
,18,52,9,21,17,22,16,23,15,24,15,24,15,24,15,24,
16,24,16,25,17,26,19,27,20,23,22,24,23,11,19,19,21,20,
21,20,21,19,21,17,22,18,18,18,23,19,23,20,21,6,9,11,18,
,21,18,21,20,20,128,11,18,17,18,16,19,16,19,17,18,20,2
1,19,22,19,22,20,21,"
19 REM --SET DATA POINTERS FOR SIMULATED 'READ'--
20 LET P1=4
30 LET P2=1
38 REM --MAIN DRAWING LOOP--
39 REM --EACH 'GOSUB 1000' RETURNS ONE NUMBER--
40 FOR X=1 TO 5
50 GOSUB 1000
60 LET CH=D
70 GOSUB 1000
80 LET F=D
90 GOSUB 1000
100 LET T=D
110 FOR R=F TO T
120 GOSUB 1000
130 LET A=D
140 GOSUB 1000
150 LET B=D
160 FOR C=A TO B
170 PRINT AT R,C;CHR$(CH);
180 NEXT C
190 NEXT R
200 NEXT X

```

```

210 GOTO 210
999 REM --SIMULATED READ/DATA SUBROUTINE--
1000 IF D$(P1)="" THEN GOTO 1030
1010 LET P1=P1+1
1020 GOTO 1000
1030 LET D=VAL D$(P2 TO P1-1)
1040 LET P2=P1+1
1050 LET P1=P2+1
1060 RETURN

```

TRS-80 Color Computer/Cornucopia

```

9 REM --CLEAR SCREEN AND SET TO BLACK--
10 CLS(0)
19 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
20 FOR X=1 TO 7
30 READ KO,F,T
40 FOR RO=F TO T
50 READ A,B
60 FOR CO=A TO B
70 PRINT@CO+32*RO,CHR$(KO);
80 NEXT CO,RO,X
89 REM --DRAW DETAILED AND IRREGULAR PARTS--
90 FOR X=1 TO 5
100 READ KO,CO,RO
110 PRINT@CO+32*RO,CHR$(KO);
120 NEXT X
130 GOTO 130
1000 DATA 159,0,14,0,0,0,2,0,4,1,6,1,8
1010 DATA 2,10,2,23,3,25,3,26,4,27,5,27
1020 DATA 6,27,8,27,10,14,12,17
1030 DATA 233,7,15,16,19,15,20,13,16
1040 DATA 13,17,13,19,14,21,15,21,18,22,19,20
1050 DATA 217,7,14,20,23,21,25,21,26
1060 DATA 20,26,20,26,24,26,22,27,23,25
1070 DATA 255,8,10,18,19,17,20,18,19
1080 DATA 223,11,13,16,17,15,18,16,17
1090 DATA 159,10,12,22,23,21,24,22,23
1100 DATA 191,12,14,20,21,19,22,20,21
1110 DATA 225,17,15,225,22,15
1120 DATA 209,26,15,210,28,14
1130 DATA 210,29,15

```

TRS-80 Model III/Cornucopia

```

9 REM --CLEAR SCREEN--
10 CLS
19 REM --DRAW LARGE, REGULAR AREAS OF PICTURE--
20 FOR X=1 TO 6
30 READ CH,F,T
40 FOR RO=F TO T
50 READ A,B
60 FOR CO=A TO B
70 POKE 15360+CO+64*RO,CH
80 NEXT CO,RO,X
89 REM --DRAW DETAILED AND IRREGULAR PARTS--
90 FOR X=1 TO 28
100 READ CH,CO,RO
110 POKE 15360+CO+64*RO,CH
120 NEXT X
130 GOTO 130
1000 DATA 191,0,13,7,7,7,8,7,10,8,13,8,16,9,20,10,25
1010 DATA 11,45,12,48,13,49,15,49,17,49,20,26,25,31
1020 DATA 239,8,15,28,32,25,28,25,28,25,29,28,34,32
1030 DATA 34,30,34,33,36,42,8,15,33,39,36,38,36,39
1040 DATA 35,36,35,35,35,38,36,41,41,43,64,8,14,40
1050 DATA 45,39,48,40,48,43,48,43,49,39,50,44,47,191
1060 DATA 9,9,41,42,191,11,12,39,40,39,40,184,29,9
1070 DATA 180,35,9,175,29,10,159,35,10,130,30,11,129
1080 DATA 34,11,139,31,11,135,33,11,184,37,11,180,42
1090 DATA 11,139,37,12,135,42,12,190,38,11,189,41,11
1100 DATA 175,38,12,159,41,12,160,40,8,144,43,8,139

```

AUTUMN PROGRAMS

```
1110 DATA 40,9,135,43,9,188,41,8,188,42,8,191,46,11
1120 DATA 191,46,12,184,45,11,180,47,11,139,45,12
1130 DATA 135,47,12
```

VIC-20/Cornucopia

```
9 REM --RESERVE SPACE IN HIGH MEMORY--
10 POKE 52,24
20 POKE 56,24
30 CLR
39 REM --RESET CHARACTER SET POINTER--
40 POKE 36869,254
50 PRINT CHR$(147);
59 REM --SET SCREEN COLOR TO BLACK--
60 POKE 36879,8
69 REM --REDEFINE SPACE CHARACTER--
70 FOR X=6400 TO 6407
80 POKE X,0
90 NEXT X
99 REM --REDEFINE CHARACTERS @ THROUGH E--
100 FOR X=6144 TO 6191
110 READ SH
120 POKE X,SH
130 NEXT X
139 REM --MAIN DRAWING LOOP--
140 FOR X=1 TO 22
150 READ CH,KO,F,T
160 FOR RO=F TO T
170 READ A,B
180 FOR CO=A TO B
190 POKE 7680+CO+22*RO,CH
200 POKE 38400+CO+22*RO,KO
210 NEXT CO,RO,X
220 GOTO 220
1000 DATA 168,1,148,33,148,1,84,34
1010 DATA 3,15,31,63,127,127,255,255
1020 DATA 192,240,248,252,254,254,255,255
1030 DATA 255,255,127,127,63,31,15,3
1040 DATA 255,255,254,254,252,248,240,192
1050 DATA 197,231,125,60,60,125,231,197
2000 DATA 5,7,0,21,0,0,0,1,0,2,0,2,0,3
2010 DATA 1,4,1,5,1,7,1,10,2,14,2,15
2020 DATA 2,16,3,17,3,18,4,18,5,18
2030 DATA 5,18,6,18,7,18,8,8,9,9,10,11
2040 DATA 81,5,10,22,11,13,10,14,9,12
2050 DATA 8,12,8,9,8,9,8,10,8,9,8,9
2060 DATA 9,10,10,11,12,13,13,14
2070 DATA 81,6,10,22,14,14,15,15,15,16
2080 DATA 15,17,15,17,16,17,17,17,17,17
2090 DATA 14,17,16,18,16,19,17,18,18,19
2100 DATA 81,2,14,22,13,14,13,15,12,13
2110 DATA 13,13,13,13,14,15,15,15,16,15,15
2120 DATA 1,5,16,16,14,14,2,5,16,16,15,15
2130 DATA 3,5,17,17,14,14,4,5,17,17,15,15
2140 DATA 6,6,16,17,16,16,16,16
2150 DATA 1,7,12,12,13,13,2,7,12,12,14,14
2160 DATA 3,7,13,13,13,13,4,7,13,13,14,14
2170 DATA 1,2,14,14,10,10,2,2,14,14,11,11
2180 DATA 3,2,15,15,10,10,4,2,15,15,11,11
2190 DATA 1,4,17,17,10,10,2,4,17,17,11,11
2200 DATA 3,4,18,18,10,10,4,4,18,18,11,11
2210 DATA 0,3,13,21,11,11,12,12,12,12,11,11
2220 DATA 12,12,12,12,11,13,12,14,14,14
```

PROGRAMMING P.S.

Corrections to previous months' programs—
and enhancements suggested by our readers

Commodore 64/Proto and the Dormirians (April, pages 100-102)

Line 470 should read

```
470 MS="YOU'RE STUCK ON DORMIR UNTIL NEXT WEEK.":GOTO  
500
```

TI-99/4A/Liberty Bell (July, page 58)

Gail Rich of Indianapolis, Indiana, and her 4-year-old son discovered a way to improve the sound of our *Liberty Bell* program. A richer, more bell-like tone can be achieved by adding lines 281-284 as shown:

```
281 FOR V=0 TO 28 STEP 4
282 CALL SOUND(-100,340,V)
283 NEXT V
284 CALL SOUND(-100,340,28)
```

TIPS TO THE TYPIST

1. When you type program lines into your computer, be sure to copy them exactly as written. Numbers, punctuation marks, and spaces are very important!
2. Remember to press RETURN or ENTER after every completed program line.
3. Run the program when you finish typing it in by typing RUN and pressing the RETURN or ENTER key. If the computer gives you an error message, don't panic. Mistakes can be fixed. List the program by typing the word LIST and pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.
4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.
5. When all else fails . . . turn off the computer and relax.

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THE CASE OF THE MISSING LAPIS LAZULI

Can You Solve The Mystery?

PUZZLE BY PETER FAVARO

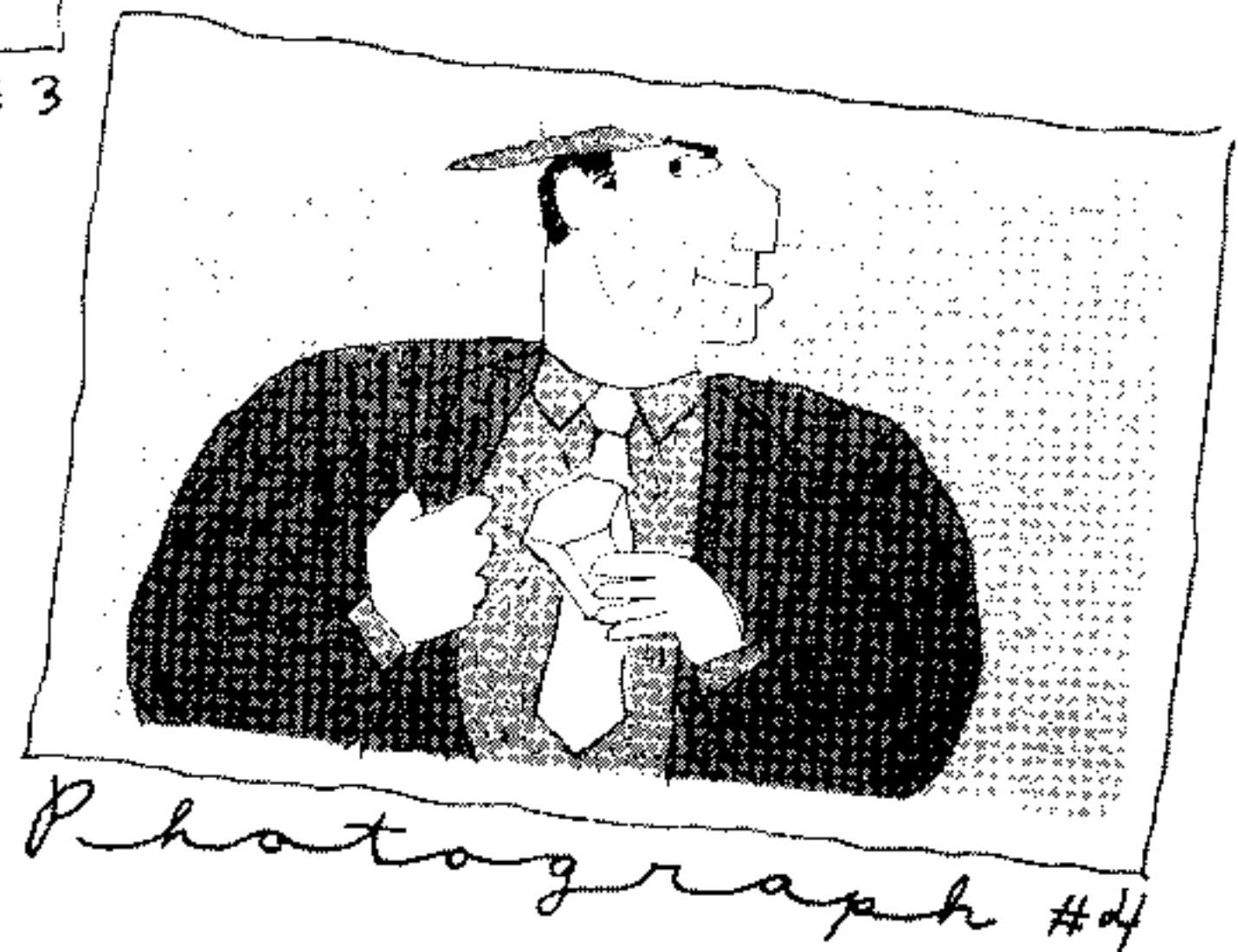
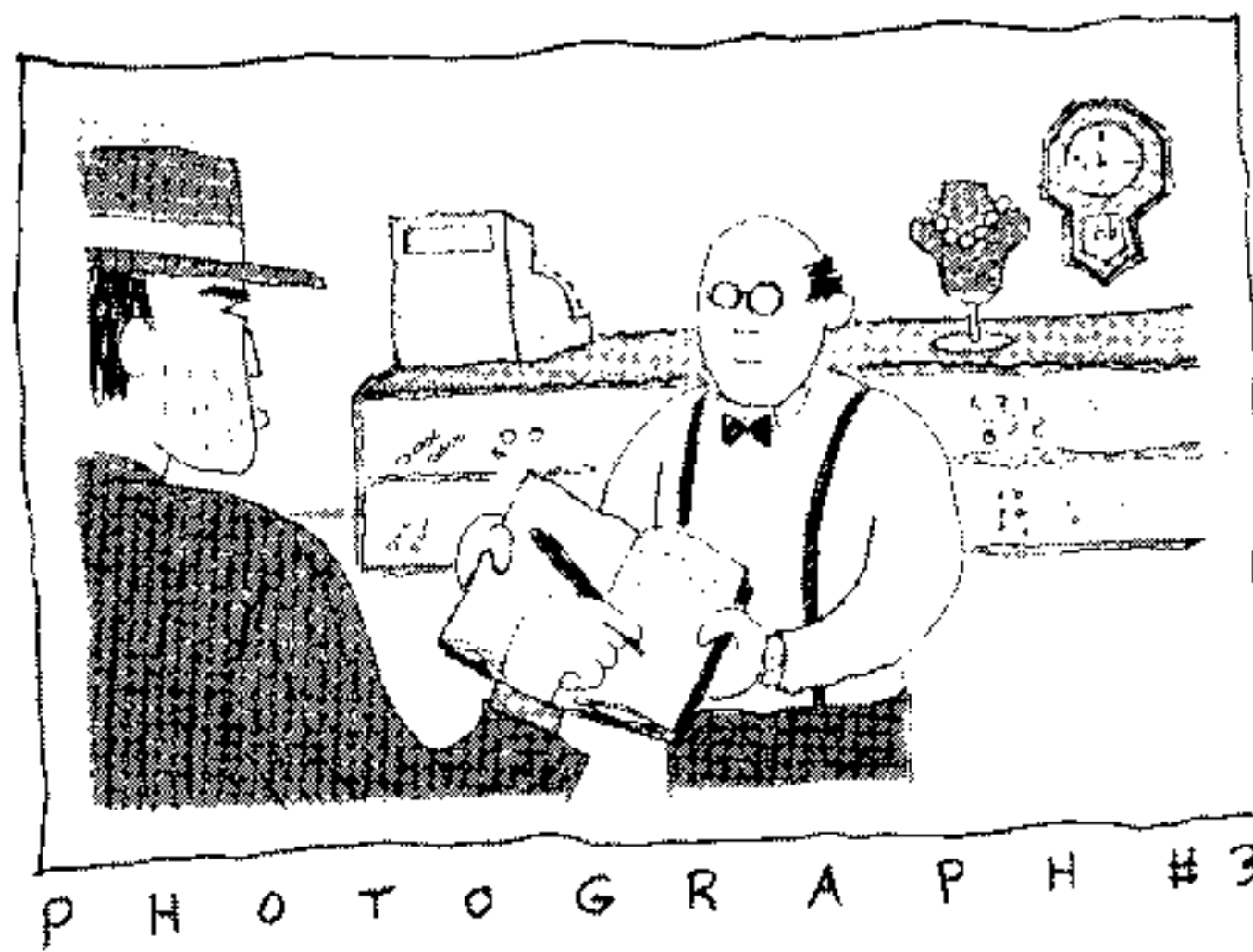
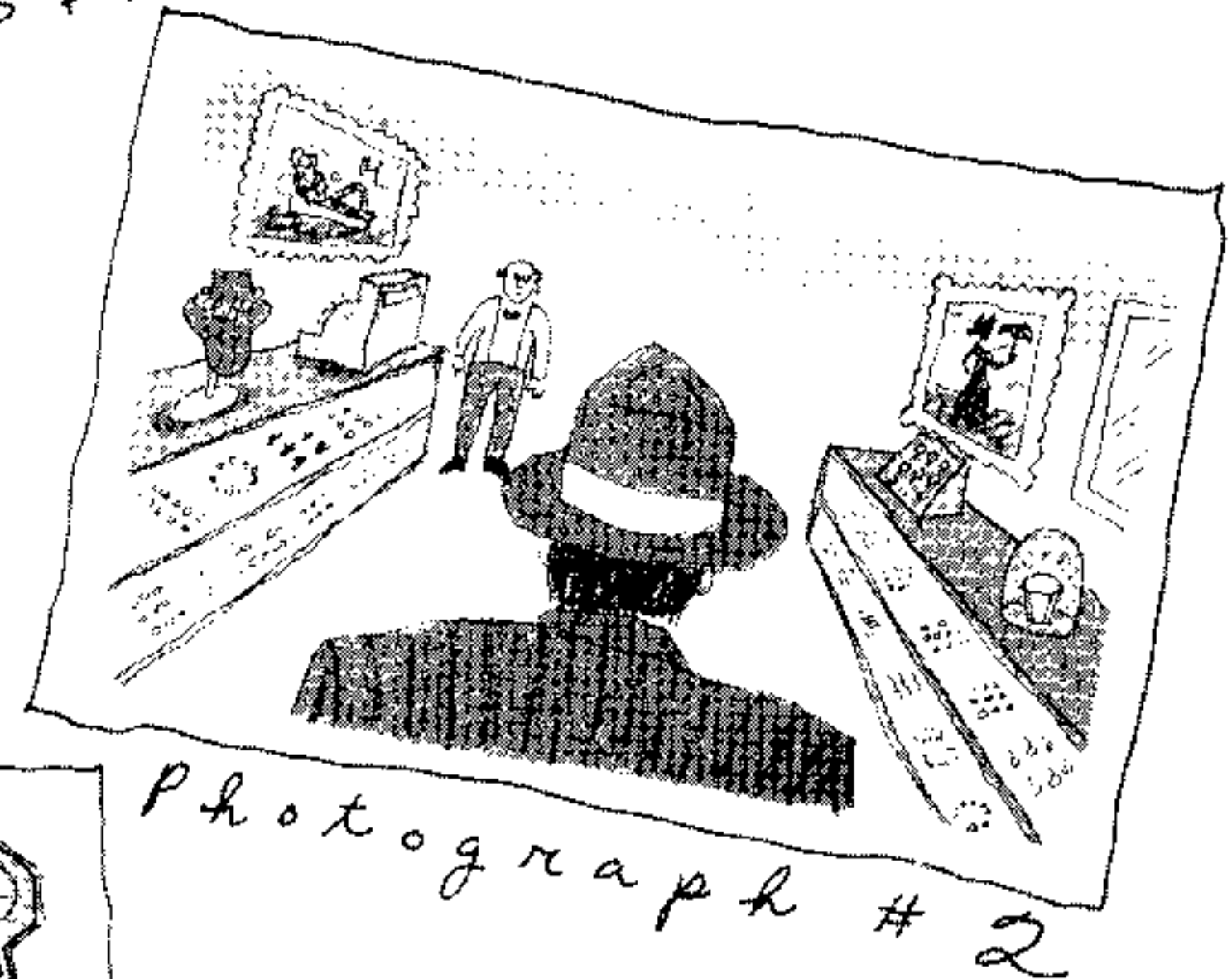
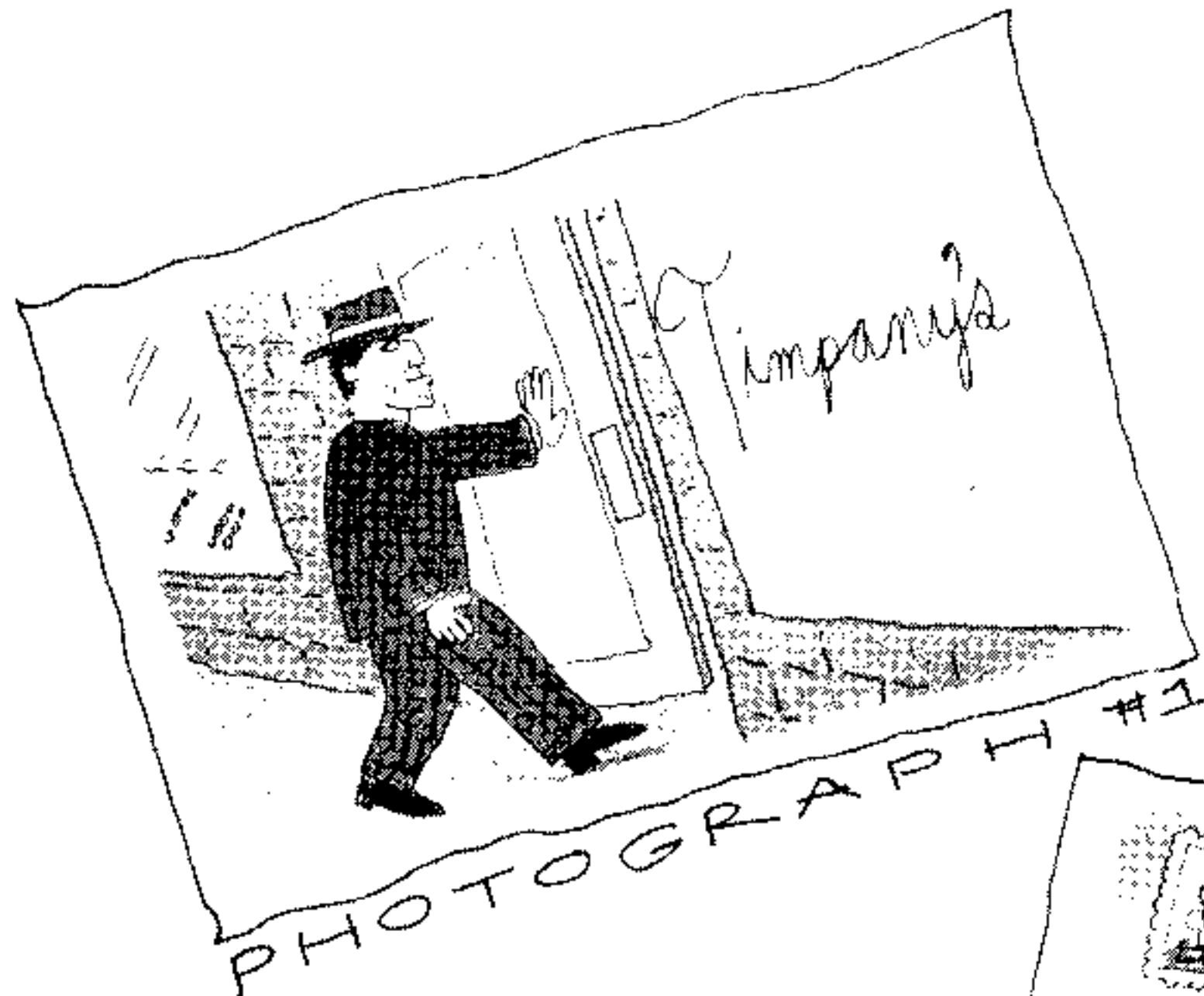
PROGRAM BY STEVEN C.M. CHEN

Savoring her latest victory, Lynette Leighton leaned back in her chair long enough for a fresh wisp of perfume to sweeten the air in her musty office. As the saying goes, Lynette had legs that went from here to there and back again. Her large black eyes sparkled as bright as the stolen stones she was hired to recover.

There was a quick knock on the glass door that read "Lynette Leighton, Private Eye—Specializing In Rare Gem Thefts." Lynette's protege, James, walked into the office with his usual aplomb, spilling the contents of his coffee cup all over his shoes. Half out of breath, James said with some urgency that Lynette was being called out of town on another case by a wealthy diamond merchant in Geneva, Switzerland. Lynette nodded toward the folder of photographs on her desk, and asked James if he could manage to close up the Larson case.

"No problem," said James as he deftly caught his cuff link in the drawer of Lynette's desk, cleanly removing his shirt sleeve from his arm and emptying the contents of her desk onto the floor in one swift move.

The Larson case had gone off as smooth as silk. Frank ("Fingers") Larson, alias Louis ("Lefty") Bourgenion, was a high-class jewel thief who had always eluded Lynette. That morn-



PETER FAVARO, PH.D., is a contributing editor to FAMILY COMPUTING. His inspiration for this puzzle came from the dinner table stories told by his father, a retired New York City detective. STEVEN C.M. CHEN is a contributing technical editor to FAMILY COMPUTING.

ing, shortly after 9 a.m., Lynette had dressed as a wealthy, camera-laden tourist and trailed Fingers. This time she had him nailed, with two crisp shots of Fingers entering

Timpany's jewelry store, one of him signing the guest book with an assumed name, and another of him slipping the flawless 29-carat lapis lazuli into his jacket.

LATER THAT DAY . . .

When James arrived at the police station with the evidence, Fingers snickered and said, "I got an alibi. See what da clock sez in dese photos? I wuz on a

PUZZLE

```

1030 NEXT I: NS=RS(1,J-1):GOSUB 2000
1040 RS=RS(J-K+1,LEN(RS)):GOTO 1000
2000 IF LEN(NS)=40 THEN PRINT NS: RETURN
2010 POKE 85,INT((40-LEN(NS))/2):PRINT NS: RETURN
3000 FOR I=1 TO 10:PRINT :NEXT I: RETURN
4000 DATA 3,THINBCHA,BURGEKCN,TUVION,4,CWKHUH*V
4010 DATA MABGUVAT,SYBLAR,GHIVBA,5,MLBH4ER,KHLDETYR
4020 DATA NMCIF,NHWAS,KHTES,5,PIXUHBEA, FNURSKY
4030 DATA MJBHYQA4G,SUX,CHADPLQLQJ,1,MPYBPX,1,DAEXGL
4040 DATA 1,BYTKUVYCVEJ,1,C5=7<1,1,MZVEEBE,15
4050 DATA DGSVVIGX%,AQIPUP,J=LIME,GAHRLU,IRW,SMAX
4060 DATA DQMVVS2,FZNK,SATGWL,MBA,KESP,TWFIWE,HIZM
4070 DATA CUHYHUVHG1,4,MERSYRPG,LAZ,TNBY,IBLNWN7

```

TI-99/4A/The Missing Lapis Lazuli

```

10 RANDOMIZE
20 DIM E$(11)
30 CALL CLEAR
40 FOR I=1 TO 11
50 D$=""
60 READ A
70 FOR J=1 TO A
80 READ T$
90 C=ASC(SEG$(T$,1,1))-64
100 FOR Z=2 TO LEN(T$)
110 N=ASC(SEG$(T$,Z,1))-C
120 IF N+C<65 THEN 150
130 Y=N-26*(N<65)
140 GOTO 160
150 Y=N-33*(N<32)
160 D$=D$&CHR$(Y)
170 NEXT Z
180 D$=D$&" "
190 NEXT J
200 E$(I)=SEG$(D$,1,LEN(D$)-1)
210 NEXT I
220 RS="CHOOSE THE PICTURE YOU WOULD LIKE TO EXAMINE (
1, 2, 3, OR 4)."
230 GOSUB 1000
240 PRINT "NUMBER? ";
250 CALL KEY(3,P,S)
260 IF (P<49)+(P>52) THEN 250
270 RS="PICTURE #"&CHR$(P)
280 GOSUB 1000
290 PRINT : "WHAT OBJECT WOULD YOU LIKE"
300 PRINT TAB(8); "TO EXAMINE?"
310 PRINT
320 INPUT "THE ":S$
330 IF S$="" THEN 270
340 IF P<>51 THEN 380
350 IF (S$<>E$(5))*(S$<>E$(6))*(S$<>E$(7)) THEN 380
360 RS="THE "&S$&" SAYS "&E$(8)
370 GOTO 390
380 RS=E$(INT(RND*4)+1)&" THE "&S$&"! YOU'D BETTER LOO
K ELSEWHERE."
390 GOSUB 1000
400 GOSUB 3000
410 PRINT "PRESS <E> TO EXAMINE THIS": "PHOTO AGAIN; <S
> TO SELECT A": " NEW PHOTO; OR <G> TO GUESS."
420 CALL KEY(3,K,S)
430 IF K=83 THEN 220
440 IF K=69 THEN 270
450 IF K<>71 THEN 420
460 RS="WHAT IMPORTANT OBJECT DID JAMES FAIL TO TAKE I
NTO CONSIDERATION?"
470 GOSUB 1000
480 INPUT "THE ":T$
490 IF T$="" THEN 460
500 IF T$<>E$(9) THEN 540
510 RS=E$(10)
520 GOSUB 1000
530 END

```

```

540 RS="WRONG!"
550 GOSUB 1000
560 GOSUB 3000
570 PRINT "PRESS <S> TO SELECT A PHOTO OR <H> FOR HELP
"
580 CALL KEY(3,K,S)
590 IF K=83 THEN 220
600 IF K<>72 THEN 580
610 RS=E$(11)
620 GOSUB 1000
630 GOSUB 3000
640 PRINT "PRESS ANY KEY TO CONTINUE."
650 CALL KEY(3,K,S)
660 IF S=0 THEN 650 ELSE 220
1000 CALL CLEAR
1010 IF LEN(RS)>28 THEN 1060
1020 NS=RS
1030 GOSUB 2000
1040 PRINT
1050 RETURN
1060 J=29
1070 K=1
1080 FOR I=29 TO 2 STEP -1
1090 IF SEG$(RS,I,1)<>" " THEN 1130
1100 K=0
1110 J=I
1120 I=1
1130 NEXT I
1140 NS=SEG$(RS,1,J-1)
1150 GOSUB 2000
1160 RS=SEG$(RS,J-K+1,LEN(RS)-J+K)
1170 GOTO 1010
2000 PRINT TAB((28-LEN(NS))/2);NS;
2010 IF LEN(NS)=28 THEN 2030
2020 PRINT
2030 RETURN
3000 FOR I=1 TO 7
3010 PRINT
3020 NEXT I
3030 RETURN
4000 DATA 3,THINBCHA,BURGEKCN,TUVION,4,CWKHUH*V
4010 DATA MABGUVAT,SYBLAR,GHIVBA,5,MLBH4ER,KHLDETYR
4020 DATA NMCIF,NHWAS,KHTES,5,PIXUHBEA, FNURSKY
4030 DATA MJBHYQA4G,SUX,CHADPLQLQJ,1,MPYBPX,1,DAEXGL
4040 DATA 1,BYTKUVYCVEJ,1,C5=7<1,1,MZVEEBE,15
4050 DATA DGSVVIGX%,AQIPUP,J=LIME,GAHRLU,IRW,SMAX
4060 DATA DQMVVS2,FZNK,SATGWL,MBA,KESP,TWFIWE,HIZM
4070 DATA CUHYHUVHG1,4,MERSYRPG,LAZ,TNBY,IBLNWN7

```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM & Apple/The Missing Lapis Lazuli

Use the base version, with the following alterations:
Change CLS to HOME in lines 90, 130, 160, 270, 300, and 360.

Change lines 120, 150, 190, 240, 290, 340, and 380 to read as follows:

```

120 GET P$:IF P$<"1" OR P$>"4" THEN 120
150 GOSUB 1000:PRINT:INPUT "THE ":S$:IF S$="" THEN 130
190 I=RND(1)*4+1
240 GET K$:IF K$="S" THEN 90
290 PRINT:INPUT "THE ":T$:IF T$="" THEN 270
340 GET K$:IF K$="S" THEN 90
380 GET K$:GOTO 90

```

Finally, if you have an ADAM, change line 10 to read

```
10 DIM E$(11):WL=31:WX=9:TRU=1:TL=1:HOME
```

If you have an Apple, change line 10 to read

```
10 DIM E$(11):WL=40:WX=10:TRU=1:TL=1:HOME
```

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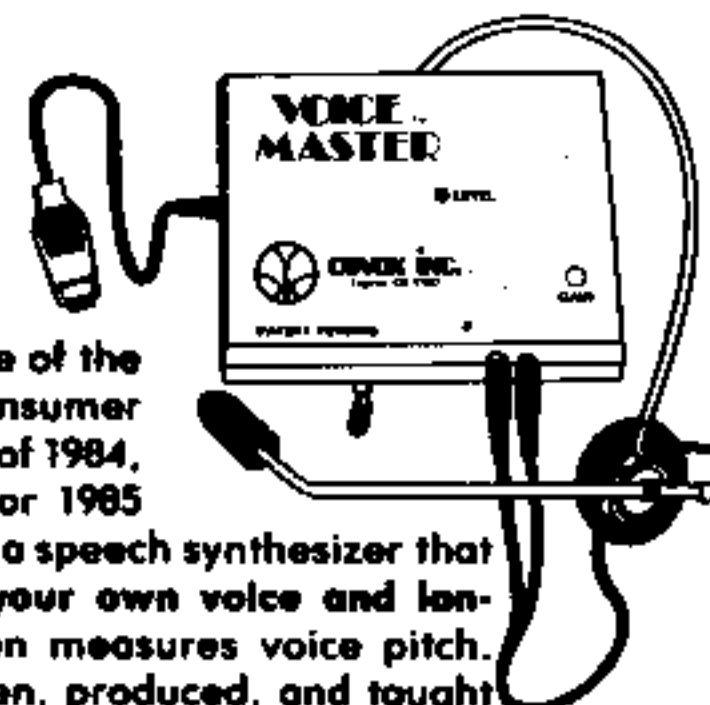
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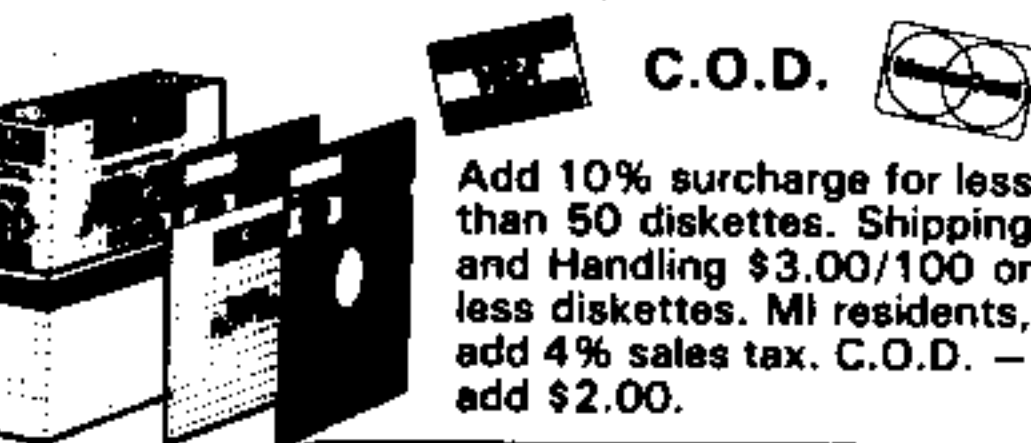
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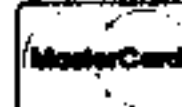


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