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PUBLISHED BY SCHOLASTIC INC.

AUGUST 1984

VOLUME 2
NUMBER 8

APPLE IIc
A Hands-On Review

FAMILY COMPUTING

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FAMILY COMPUTING

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FAMILY COMPUTING (ISSN 0738-8079) is published monthly by Scholastic Inc., 730 Broadway, New York, NY 10003. Subscriptions: in the U.S. and possessions, 12 issues for \$17.97; outside the U.S. add \$6 (surface mail) or \$24 (airmail). Office of publication: 351 Garver Rd., P.O. Box 2700, Monroe, OH 45060-2700. Application to Mail at Second Class Postage Rates is pending at Monroe, Ohio, 45060-9998 and additional offices. POSTMASTER: Send address changes and notice of undelivered copies to FAMILY COMPUTING, P.O. Box 2511, Boulder, CO 80322. Printed in U.S.A. Copyright © 1984 by Scholastic Inc. All rights reserved.

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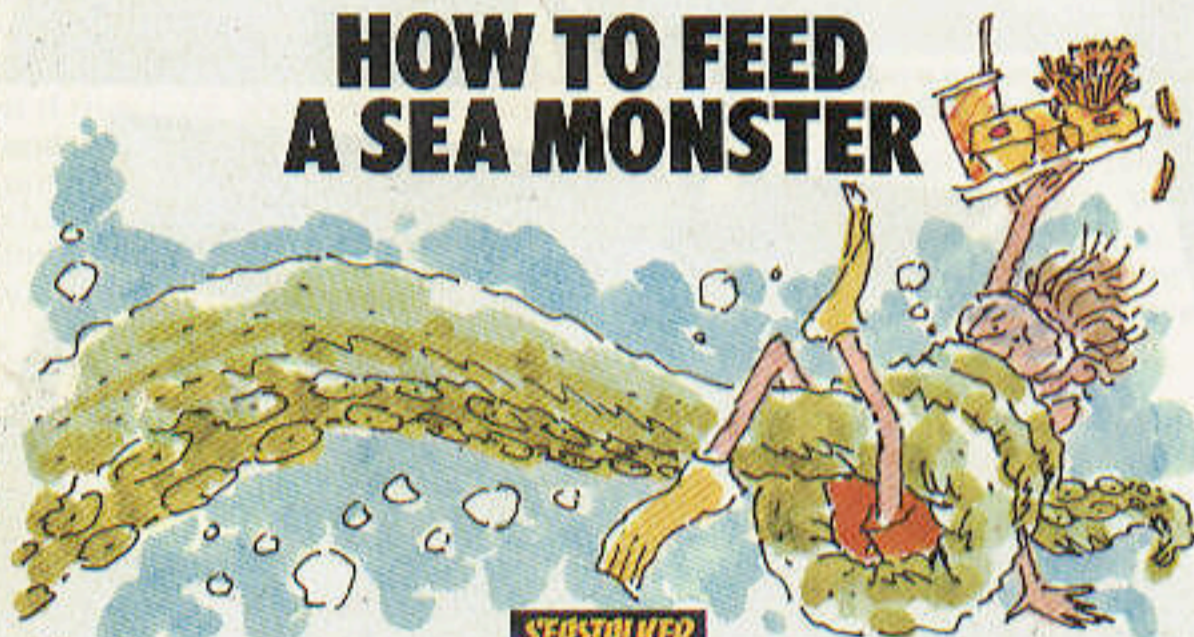
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*It's compatible with almost every popular home computer. SEASTALKER is a trademark of Infocom, Inc.

BEHIND THE SCREENS

country in Asia can cost about \$20. Using state-of-the-art technology that U.S.A.I.D. could finance, it could cost less than \$1, Rothman says.

There is already a model for the EPC. It's called Carinet, and it links computer users in the U.S., the Caribbean, Southeast Asia, and Africa. Carinet brings Third World buyers and sellers together and gives them advice on becoming more productive. For example, Carinet taught an African potter how to make a ceramic insulator he could then sell to his local phone company.

Rothman admits the EPC has some major political obstacles to overcome. The Peace Corps is neutral about his concept and no presidential candidate has endorsed it. Still, he says he's received an enthusiastic response from scores of technical and nontechnical people around the country. If you like his idea, he says, write your representative in Congress. —ROBIN RASKIN

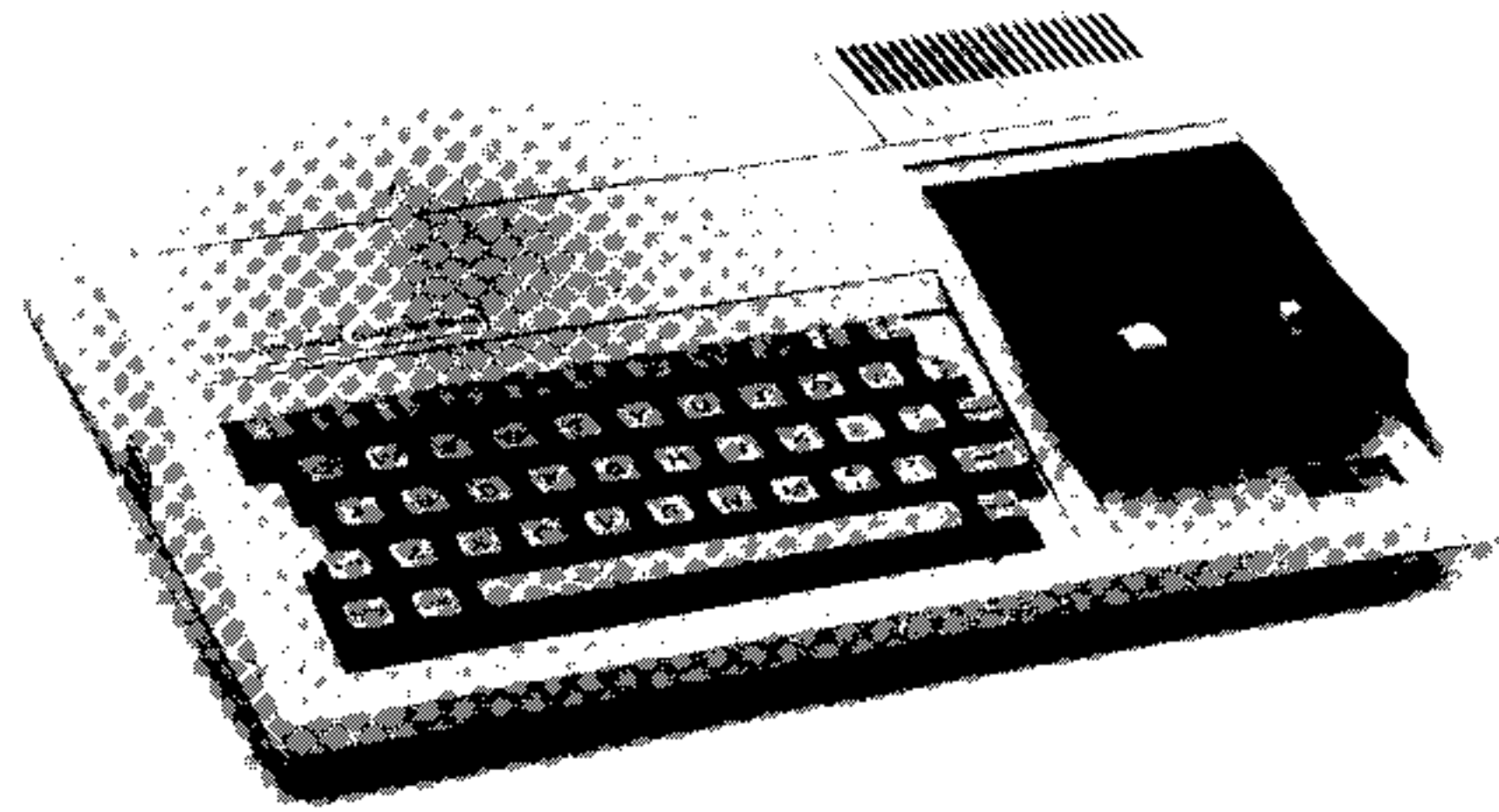
Nibbles

Computer as Art: The Mindset Personal Computer, a \$2,398 IBM-compatible with exceptional color graphics, is now a permanent part of the Architecture and Design Collection of New York City's Museum of Modern Art. The Mindset was chosen not for what it does, but for its design. It joins the Grid Compass portable computer, selected last year.

New Timex Resource: *The Timex Sinclair User's Encyclopedia* lists a wide variety of game, home management, business, and personal productivity software for the TS 1000, 2068, and Sinclair ZX81 computers. It also includes a programmer's guide. Published by Arrays, Inc., of Los Angeles, the \$14.95 book is available at bookstores and at some computer stores.

Provocative Quote: "One of the worst pieces of advice you can give to a young person is to go into programming. It seems like a good field right now, but it is inherently automatable and will be automated, and much of that will happen in the next 10 years."—Edward Feigenbaum, leading artificial intelligence researcher and coauthor of *The Fifth Generation*. ☐

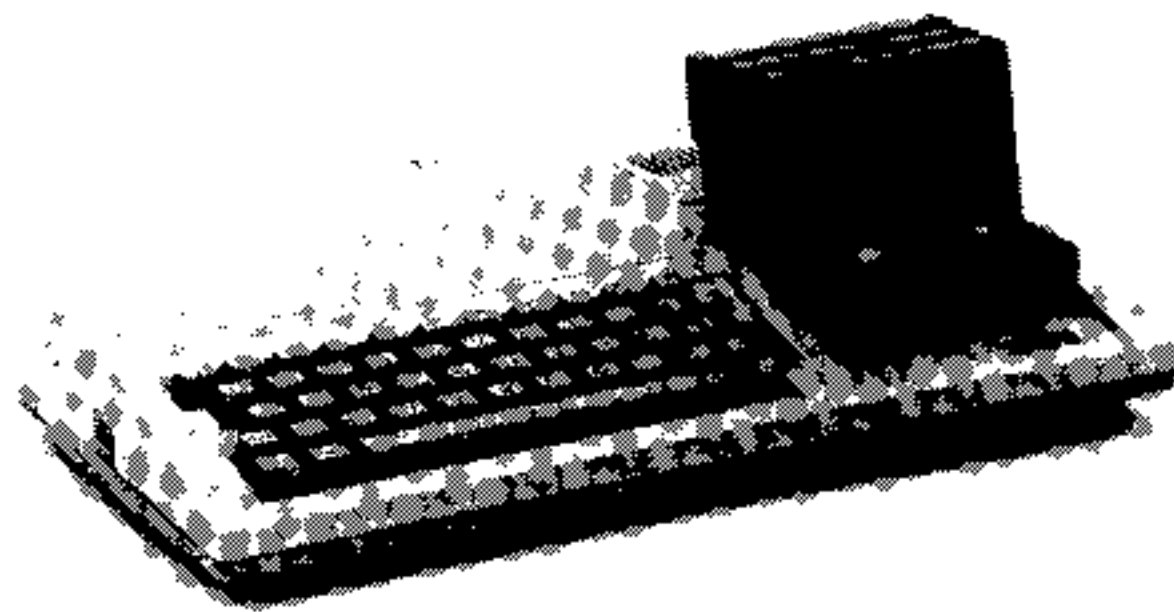
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HOME-SCHOOL CONNECTION

HOW TO START A 4-H COMPUTER PROJECT Swine Program Wins Blue Ribbon

BY ESTHER McCRUMB

Nowadays, both programmers and pigs win Blue Ribbons.

In 1982, when I set out to start a 4-H computer project in Weld County, Colorado, I didn't know much about computers. I did have a conviction that computers would be a household appliance before long. And, as a 4-H (Head, Heart, Hands, and Health) leader, a feeling that kids and computers were a natural combination. The project didn't get off the ground right away. But, after several false starts, it's running nicely now, with 18 kids preparing for this summer's computer competition at the County Fair.

In other areas of the country, 4-H projects are going beyond the fairgrounds and into the schools, where students and teachers alike are becoming computer literate. (The 4-H program originated in 1914 as an extension of the U.S. Department of Agriculture, which funded state universities to help bring education to rural areas.) 4-H agents in Kentucky, for example, each year cart 14 TRS-80 computers into schools in some 35 counties, give a basic introduction to computers, and often prompt administrators to make computer purchases.

As Jon Irby, a 4-H program leader in the U.S. Department of Agriculture, said, "It's not fair at this point to depend that heavily on the schools [to introduce students to computers]." He added that 4-H clubs, with help from their sponsoring state universities, could pool resources with public schools to benefit both groups. The 4-H computer project in Weld County, while not directly involving schools, does depend

ESTHER McCRUMB is a member of the school board in Fort Lupton, Colorado, where she lives with her husband and two children. She has been a 4-H leader for "about nine years," and writes news and features for several newspapers.



Byron Farquer (right), whose "Swine" program won a 4-H Blue Ribbon at a Colorado county fair. At left, Quentin Goodwin—the judge.

on area classrooms for its meeting space. A similar project could be organized almost anywhere.

WAY TOO TECHNICAL

To start things off, Natalie Chlop, then a systems analyst in the Weld County data-processing department, enlisted the interest of one of her co-workers, Johnna Rawlings. She, in turn, got a commitment from her husband, Austin. Austin, who was head of Greeley, Colorado's data-processing department, got permission from the city to make its UNIVAC mainframe computer and three terminals available to 4-H members one night a week.

The three computer experts mapped out a class for 4-H members and their parents. They would meet at City Hall for an hour's instruction, to be followed by an hour on the terminals. Sessions would run 16 weeks.

After the formal course was finished, instructors would be available to help 4-H'ers develop and debug their own programs. These would then be judged at the County Fair at the end of July. Sixteen 4-H members, ranging in age from 9 to 14, and eight parents started the course. Most got through the first five weeks. After that the attrition rate soared.

True to their training in data processing, the computer experts explained concepts such as flowcharts, binary code, and decimal and hexadecimal bases—all integral to serious programming. A few of the mathematically inclined youngsters absorbed these concepts, but most found them confusing.

The instructors dutifully completed seven sessions before deciding they had lost the interest of most of the kids. My own two children commented that the sessions were "too much like school." In a postmortem on the project, we decided that it had all been too technical. Knowledge of hexadecimal code isn't necessary to run a microcomputer, which is what most of the kids might ultimately have at home or meet in the classroom. So that project, which we had mistakenly entitled "Data Processing," was dropped.

I BUY A TI

Despite this somewhat inauspicious start and my own lack of knowledge, I still was convinced that kids and computers were a natural combination. To find out what micros were all about, I bought a Texas Instruments 99/4A computer. The first thing I learned was that the instruction during those first data-processing sessions was not very pertinent to the BASIC manual that came with the computer. And the BASIC manual itself was not particularly inspiring.

I enrolled in a computer class at Aims Community College (through its Eaton, Colorado, extension), which was about 40 miles from my home. I explained my dream of a 4-H project to Quentin Goodwin, who taught computer classes there. He thought it was a good idea, but shook his head when I said I wanted to write a generic manual that would cover the many microcomputers on

HOME-SCHOOL CONNECTION

the market—in a fashion that would appeal to kids.

Through a questionnaire in the monthly 4-H newsletter—which Marion Krueger, a 4-H Extension Youth Agent, helped put together—we learned that 22 4-H members were interested in pursuing another computer project. One had an Apple II at home, one had an Atari, another a Commodore PET, a few had TRS-80s, and 12 had TI-99/4As. Several had access to Apples or TIs at school. Marion, who had also been attending seminars on micros, began collecting material that she thought would help me in my efforts to write an easy-to-understand manual—one general enough to let kids accomplish the same things on whichever computers they had access to.

PAY DIRT

Pay dirt was struck when Marion came up with draft copies of 4-H manuals developed in Kentucky for the TRS-80. Kentucky 4-H'ers have made remarkable advances involving some 15,000 young people with computers. Using the Kentucky Unit 1 4-H manual as a guide, I collected an Applesoft BASIC manual and one for the TRS-80, in addition to my own TI manual. I then wrote an introductory, generic manual that 4-H'ers could use on their own to begin a project, namely to write several programs for the County Fair.

Two members of our own Southern Funny Farmers 4-H Club, of which I am the leader, enrolled in the project: Craig Mayer, 12, who lives on a farm about a half mile from my home, and Byron Farquer, 18, who had just completed his junior year in high school. On his own, Byron had learned to operate a Timex 1000. Both boys had access to Apple computers at school and had a burning interest in computers.

After they received their manuals, they came to my home to work through the unit on my TI computer. Neither seemed to have any problem switching from the computers they were familiar with.

DAY AT THE FAIR

Marion began to contact computer dealers to find a judge for the fair. She learned that Quentin Goodwin, my community college instructor who also is a business partner in a company called Computer Consultants, would have a booth at the fair. He agreed to set up three sepa-

rate tests: beginner, beginner/intermediate, and intermediate. The beginner test required participants to write a program that printed their name, age, and address on the screen. The beginner/intermediate asked for a program with a loop that counted in increments of 5 (5,10,15, etc.). The intermediate asked for a program with a conversion table (Centigrade to Fahrenheit) that used a FOR . . . NEXT loop.

For the contest, Byron went one step further and developed an original program to give the average and median weight of up to 50 swine. After running the programs for Goodwin, Byron spent about an hour discussing them and his computer's limitations. "There's a boy I want to watch," Goodwin commented afterwards. Byron ended up as the Blue Ribbon winner in the senior division and as overall champion. Craig won second place (Red Ribbon) in the junior division.

CH-CH-CH-CH-CHANGES

While I was gathering material for a generic Unit II manual, Marion learned of Kentucky's 4-H Computer

STARTING A 4-H COMPUTER PROJECT

1. Contact your county's 4-H Extension Office (in your phone book). The office will probably refer you to a 4-H club in your area or enlist you as a county-wide project leader. Remember: If the idea of a computer project is totally new, you may have to put it together from the ground up.
2. Do a survey in a monthly 4-H newsletter to find out how many kids are interested and what computers they own or have access to.
3. Get 4-H Computer Project Manuals from your county's Extension Office. Study the Leader's Guide and use any of the many suggested formats for project meetings. If you're dealing with computers for which no 4-H instruction manual exists, use the format to write your own while referring to the computer's owners manual.
4. Set up a long-term project goal. Arrange a test for the County Fair competition and find a good judge.
5. Share what works and doesn't work with the local Extension Office. Ask them for information on projects in other states.


Project Manuals I, II, and III, plus a Leader's Guide, and specific manuals for TRS-80, Apple, and IBM microcomputers. In reviewing these manuals, I decided anyone who knows how to turn on a computer can learn to use one. Seeing no sense in reinventing the wheel, we have been using the Kentucky materials ever since.

I still have to write specific manuals for Atari, Commodore, Timex, and TI, but they will need to work as a goad only. My experience with 4-H kids is that you get them excited, offer some training and a lot of encouragement, and then stand back. In 1983, for instance, we had no regularly organized computer project. Kids worked at home on their own with my manuals and prepared projects for the fair.

This year, the project changed again. We sponsored a two-hour workshop every Saturday at Heath Junior High School in Greeley. Eighteen kids paid \$15 each for a six-week course. And guess who was back teaching? Austin and Johnna Rawlings, the data-processing mainframe experts—teaching about micros! Quentin Goodwin, for the third year in a row, will arrange and judge the 4-H computer competition.

4-H IDEAS

I believe computers, like cameras, can complement work done in other 4-H projects. Kids are encouraged to include photographs in their project's record-book narrative. Why not include a computer program that could help them judge projects, make decisions, figure rations, or adjust recipes? Why not a computer printout in the livestock record books for inventory, depreciation, rate of gain, sales, and profit or loss? The club secretary could use a word processor for club minutes, records, and correspondence. The treasurer could balance the checkbook and print out a monthly report.

Once kids use computers to accomplish some time-consuming, unrewarding task—rather than just doing the textbook examples in most computer manuals—a sense of appreciation sets in. It's something like the accomplishment you feel when you wield a hammer to pound in a nail, instead of bludgeoning it with your shoe heel or some other inappropriate instrument. It's like the feeling of reward I've gotten from starting this 4-H computer project. 

HOME BUSINESS

HELP FOR THE HOMEBOUND

Since the mid-70s, there have been an increasing number of projects around the country designed to prepare physically handicapped people to be computer programmers. Unfortunately, nearly all of them are for people who are able to commute daily to their jobs and work a full schedule.

The Handicapped Training Center's new project and the 8-year-old LIFT, Inc., are the only current operations cited by authorities in the field that are designed to train physically handicapped people to work from their homes as computer programmers.

Here are some commonly asked questions and answers concerning the two projects:

Who is qualified for the projects?

People whose physical disabilities make it extremely difficult or impossible to work a normal schedule in an office.

How can someone enroll in one of the projects?

The new Center project, funded by the RSA, is limited to those who live in the greater Philadelphia area. However people from around the country can come to the Center, live in the nearby dormitories, and take advantage of its primary training program. The address is: Physically Handicapped Training Center, 4025 Chestnut St., Philadelphia, PA 19104; (215) 898-8108.

LIFT has its headquarters in Illinois, but has field directors around the country. For information about regional opportunities, contact LIFT, Inc., 350 Pfingsten St., Suite 103, Northbrook, IL 60062; (312) 564-9005.

Are the two projects exactly alike?

No. LIFT, which has so far found employment for 55 people, still trains the homebound to use a terminal connected to a company's mainframe. With one exception it

does not train people to program using a personal computer. Also, LIFT wants its homebound trainees and graduates to visit their employer's office at least once a week for staff meetings and to discuss assignments. LIFT and the Center project are similar in that they initially hire graduates of their programs for work which has been negotiated on contract with the employer. The goal of both programs, however, is to encourage the companies to eventually employ these graduates directly.

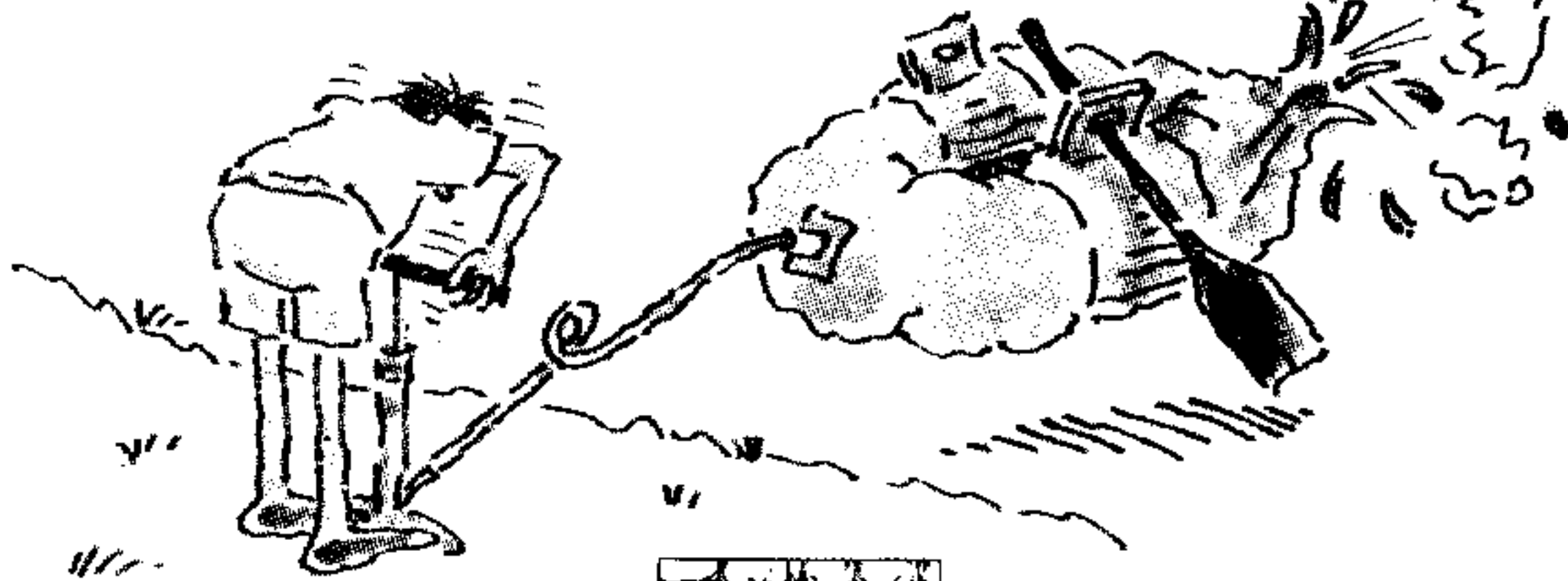
How long is the training period?

Approximately six months at LIFT and 10 months at the Center.

What does the training cost?

There is no cost. The training and equipment are supplied free of charge. Both the Center project and LIFT earn money from the companies with which they have contracts, in addition to the government funding they receive.

HOW TO BLOW UP A RUBBER RAFT



First, you need a reason to use a rubber raft. (That's a snap if you've got ZORK® I, the classic fantasy story from Infocom's interactive fiction line. Because you'll be hunting twenty fabulous treasures while dodging every kind of evil under the earth.)

Next, type in your command: BLOW UP THE RUBBER RAFT WITH THE AIR PUMP... But watch it, or you might just blow up the raft until you blow yourself to smithereens!

There's no telling what will happen next in ZORK I—because, like all of Infocom's interactive fiction, ZORK's



designed so that whatever you choose to do makes the next thing happen. And you won't run out of things to do, either. The underground empire of ZORK is so huge, your adventure can last for weeks or even months.

So if you want the closest thing on a disk to really exploring an underground world, get ZORK I*. But brace yourself for the action—it'll blow you away!

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quickly discovered, software could be developed much more quickly—and, perhaps most important, at less expense—on a micro than on a mainframe.

Schuh knew he could probably hire some freelance programmers at \$35 an hour, but that was more than the company was paying its experienced personnel to work on the mainframe. Then he remembered the Handicapped Training Center where he had once attended an open house. He had been impressed by both the quality of the Center's computer science project and by the fact that its graduates were highly qualified, super-motivated, and worked for considerably less than \$35 an hour. He contacted John Connolly and asked whether the Center could develop software for IBM PCs. He wanted not only the services of its graduates, but also for the Center to assume responsibility for assigning and supervising the work.

Connolly said "Sure," even though at the time the Center had just acquired its own IBM PC and the staff had written only one program in BASIC. None of the handicapped students at the Center was being trained to use a personal computer.

HOME BUSINESS

director of the Center, quickly realized two things. First, companies that previously wanted to hire Center graduates to work on a mainframe might now need people who could program using a personal computer. Second, the microcomputer made it possible for the homebound to program without connecting to a mainframe and worrying companies about system security.

The two men spent most of last summer writing a proposal to the Federal Rehabilitation Services Administration (RSA) for a grant to train 20 severely handicapped people to program on a personal computer. The proposal also asked for funds to hire additional staff and to purchase 20 personal computers for installation in the homes of the people being trained. The RSA approved the proposal last fall, but granted considerably less money than was requested. Consequently, the Center has been able to train only 10 people this year, although it expects the grant to be renewed for another two years.

Unger was one of the first people

contacted by Connolly when the grant was approved and she quickly enrolled in the training program. Connolly or another staff member traveled up from Philadelphia to Unger's home to show her how to re-apply the skills she had learned at the Center more than two years earlier.

Unger's new Compaq was set on a picnic table that Tom, her husband, brought in from outside and placed on two-by-four risers at one end of a large bedroom on the first floor. As Unger sits in her wheelchair at her computer, she can look through sliding doors on her left into the greenhouse, which is connected to the house and is an integral part of the solar heating system. Beyond the windows of the greenhouse are the large backyard and the rolling countryside of rural Bucks County.

SPECIAL PROBLEMS, SPECIAL SOLUTIONS

During Unger's retraining, Connolly noticed that her hands shook more than when she had first studied at the Center in Philadelphia.


The shaking (called "intention tremor") was so bad that Unger often had trouble depressing the correct key. The Center staff constructed a special Plexiglas template to fit over the Compaq keyboard. It requires Unger to place her finger through an opening in the template in order to strike a key. She cannot accidentally depress another key at the same time. Another problem Unger had was that she found it impossible to depress two or more keys at the same time using two fingers. Yet, nearly all commands required her to simultaneously depress the CONTROL key and at least one other key. The Center staff installed a "toggle switch" that enables her to depress the CONTROL key first and then other keys separately.

A recent job Unger did for Lehigh Press was to write a program so the company can mail promotional brochures, its annual report, and other materials on a selective basis to specialized audiences.

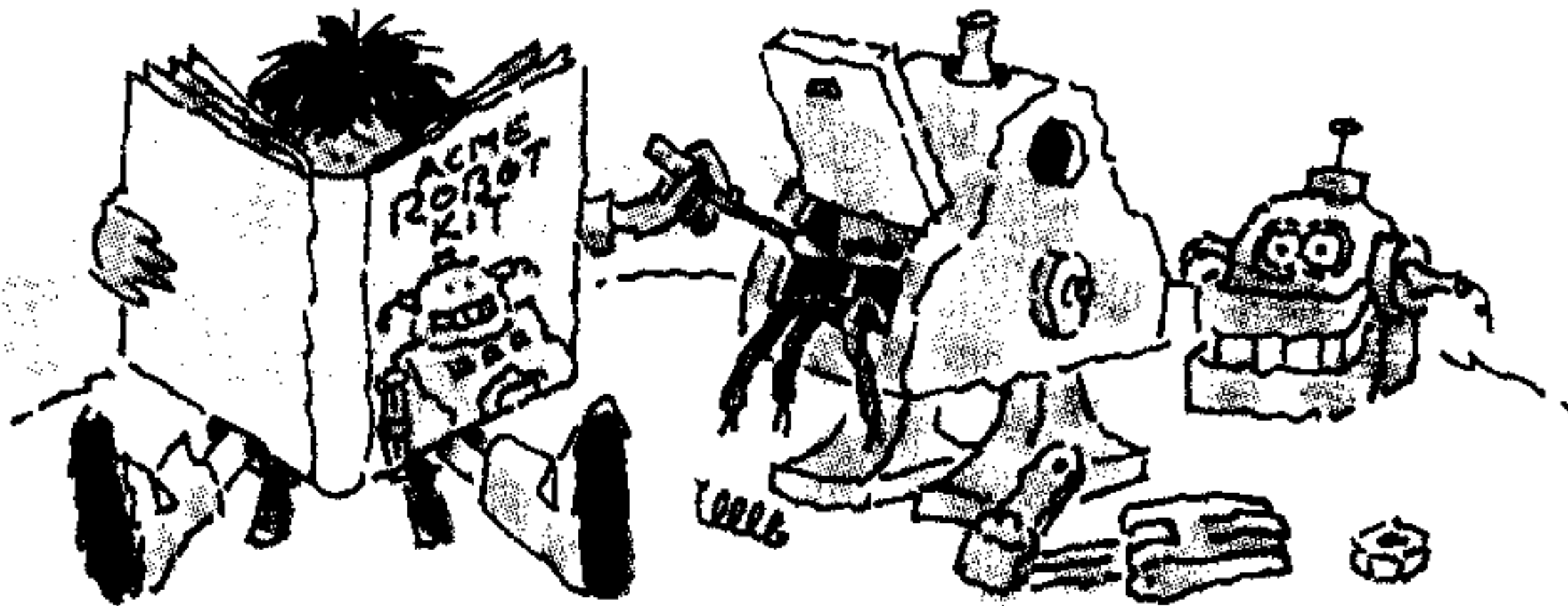
Schuh said his company has more work than it knows how to handle. He talked about Unger perhaps creating a program that would help the company discover whether it was getting the most from its considerable air-travel dollar, for example.

At least for this first year, Unger and others in the new Center project are considered trainees. Lehigh Press contracts its work through the Center, the Center staff assigns the work, and people like Unger transmit the finished program to the Center via modem. After reviewing the program, the Center in turn transmits it by modem to the employer. It is possible that eventually Unger will transmit directly to Lehigh Press or another employer, and ultimately she could be directly employed by the company. According to Connolly, Unger can expect to earn up to \$15,000 a year.

Multiple sclerosis robbed Unger of her identity as an active person who taught children at school and in her home, hiked, ran a summer camp in the mountains, and climbed the face of craggy cliffs. "At first it was hard to realize that I was no longer that person," Unger said. The new identity, of course, includes a handicap that precludes an active life. "But I'm a productive person again," she said, "and I am a person with ideas and the competence to express them.

"It's satisfying to know that someone outside the home still wants me." 

HOW TO MAKE FRIENDS ON OTHER PLANETS



First, go to another planet. (That's easy if you're traveling through space in PLANETFALL, the great science fiction comedy from Infocom's interactive fiction line.)

Next, find a robot nobody's using. Then, to make him start up, type in your command: TURN ON THE MULTIPLE PURPOSE ROBOT... You've just made a robot friend who'll follow you anywhere.

And you'll be glad you have a faithful follower—there's no telling what will happen next in PLANETFALL. Because, like all of Infocom's interactive fiction, PLANETFALL's designed



so that whatever you choose to do affects what will happen next. And there'll be plenty happening—it's an adventure filled with everything from dread diseases to mutant monsters, and it can last for weeks or even months.

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others in sound, and much easier to use because there is some similarity between the phonemes and the sounds they represent. You have variable inflection controls, both by software and by external knobs on the synthesizer itself. The volume control is also on the synthesizer, which makes it easy to control but does not allow you to change it within your programs.

The really outstanding feature of the Voice Box is its ability to sing. The vocal qualities will never win any awards, but the Voice Box performs very well. Another factor that sets the Voice Box apart is the software available. The two programs, *Music Editor* (\$29.95) and *Dictionary Editor* (\$25), are "must have" items for any serious user. *Dictionary Editor* simplifies the work of breaking down your words into the proper phonemes, and then you can save the newly created words to disk. *Music Editor* allows you to write songs and lyrics.

The Commodore 64 version of *Music Editor* is especially good and it will work without the Voice Box, though just the music, and not the lyrics, will be heard. Both *Music Editor* and *Dictionary Editor* display a high-resolution face, in full color, with lips mouthing the words. It's really remarkable and something that must be seen to be believed. Note: *When I'm 64*, another package for the 64, has some demo songs parents might find objectionable.

Alien has just introduced three new synthesizers, which we have not yet tested. The Voice Box 3 series allows you to add intonation to words or phrases such as "I love you" without spelling them out in phonemes. The Voice Box 3m (\$129) plugs into any slot in the Apple II or IIe and includes a speaking program on a disk. Voice Box 3i (for "intelligent") costs \$219, also works on the Apple IIe, and appears to programs exactly as a printer does. According to Alien, you can send your word-processing file to your printer port, and hear it spoken on the synthesizer. Voice Box 3s (\$269) connects to any computer via the serial port. A printer can be connected to the synthesizer so that you can have two peripherals coming out of one port.

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

Commodore has just released the Magic Voice Speech Module (\$50), which plugs into the expansion port on the Commodore 64. The built-in voice is not synthesized; instead, it is a digitized (or electronically recorded) female voice with a vocabulary of 235 words and phrases. These words require no memory, leaving the user with all of the BASIC workspace free. You access the words by using the command SAY, and the computer speaks the word, assuming it's one of the 235 words built in.

If 235 words are not enough for you, you'll be interested by the fact that Commodore is releasing a *Magic Voice Vocabulary Disk*, which has 10,000 words you can use, and also allows you to create some of your own. There is no software supplied with the Magic Voice, but Commodore sells a variety of cartridges that work with it. One is an educational package called *A Bee C's*. My three-year-old loved it and tried to answer the lady in the computer. There are two arcade games, *Wizard of Wor* and *Gorf*, and

TI-99/4A OWNERS! SPEECH!

Triton Products, P.O. Box 8123, San Francisco, CA 94128; (800) 227-6900; in California, (800) 632-4777.

Triton Products, a mail-order company that has taken over marketing of TI and third-party products for the TI-99/4A, says it still has some TI Speech Synthesizers in stock. They cost \$49.95, plug into the right side of the TI, and can be programmed with the Extended BASIC, Terminal Emulator II, and Editor Assembler cartridges. About 10 reading and math programs utilize the synthesizer.

several educational packages. The games use a more robotic voice instead of the natural sounding female voice. The documentation includes information for both BASIC and machine-language programmers.

Covox, Inc., 675-D Conger St., Eugene, OR 97402; (503) 342-1271.

Covox's Voice Master, which is more of a voice digitizer than a synthesizer, plugs into the expansion port on the Commodore 64. Voice Master comes with a microphone that you speak into. You can store the resulting words or phrases and then play them back later. An accompanying program gives you nine commands, including LEARN and SPEAK. With these commands you can make the 64 say anything you wish. For instance, if you keyed in LEARN 1 and said "Hello" into the microphone, the computer would say "Hello" in your voice every time you typed SPEAK 1. You can have a maximum of 64 words or phrases in the computer's memory at one time. Other words can be stored on disk or tape files and loaded into a program, giving you almost unlimited speech capability.

Finally, you can use the speech without the Voice Master hardware. In other words, once you write a program using the Voice Master, and save it, you can run the program and hear it through the 64 itself. Thus, you can create programs and give them to friends. Covox says it is developing a voice-recognition software package that will work with Voice Master and that Voice Master will soon be available for Apple, Atari, and IBM computers.

Genesis Computer Corp., Ben Franklin Technology Center, Lehigh Univ., Bethlehem, PA 18015; (215) 861-0850.

Genesis' COMvoice is a cartridge that plugs into the Commodore 64's expansion slot and adds the new BASIC command, SPEAK. You can use the command to program your own words using the phonemes or you can use it with the direct text-to-speech mode. COMvoice uses a Votrax chip, which means it gives pretty good quality speech; but, as on the Votrax systems, it's somewhat unnatural sounding.

COMvoice is particularly good at speaking numbers and will correctly say any number between -999,999,999 and +999,999,999. You also have some control over the inflection by inserting commands into the phrase you want COMvoice to say. A version of COMvoice with an external speaker and volume control costs \$139. Genesis says that it will bring out an IBM PCjr version soon.

Street Electronics Corp., 1140 Mark Ave., Carpinteria, CA 93013; (805) 684-4593.

Street's Echo speech system is available in models for Apple, IBM, and other computers (Echo II, for Apple II, \$129; Echo PC for IBM, and Echo GP for other computers, \$249). It can be used in both the text-to-speech and phonetic modes. You have separate control over rate of speech and word inflection, as in the Votrax systems. There are many differences, however. For one thing, the Echo uses some of the computer's BASIC memory, leaving less room for the user to write programs. The sound is output through whatever speaker system your computer is using. Also, the Echo is powered by the computer.

Echo speech systems come with several programs on disk, including demonstrations and applications programs. In addition you can buy *Echo Words* for Apple or IBM (\$29.95), which is a library of 719 words in a clear female voice. When I heard the female voice after listening to the robotic voice that most systems use, I was very pleasantly surprised.

Street Electronics recently released a new system called Cricket. It has both natural and robotic voices, built-in music and sound synthesizers, and a clock. Though I have yet to hear it in action, Cricket looks like a direct competitor of Votrax's Personal Speech System, and it's priced

"WE'VE HAD OUR ATARI FOR NEARLY TWO YEARS, AND CATALOGING OUR ART IS STILL ONE OF ITS MAIN USES IN OUR HOME."

from Italy, Scotland, Wales, Belgium, South Africa, Australia, and Holland. Once Bill makes a long-distance radio connection, he swaps vital information with the other party. Then, using a BASIC program he wrote with a neighbor, he enters in the party's call ID, the date of the call, the address of the party, the name of the party, the frequency of the signal he used to speak on, and additional information.

For Bill, one of the major benefits of using the computer and developing his own program is the flexibility of the filing system. "I can ask the computer to give me a list of any calls made at a certain frequency. If I remember speaking to a guy named Bob, but I can't remember his call ID, I simply ask the computer to list all the Bobs I've contacted.

"I've been involved in radio a long time, but the computer adds a great deal to the hobby."

USE A DATA BASE

The evolution of commercial software—particularly data-base management programs—has eased the computing task for the hobbyist. It's no longer necessary to write your own program, unless, of course, that happens

to be one of your hobbies. Today's hobbyist has a wide variety of data-base systems to choose from in a broad range of prices. Some are organized like index-file cards, others like spreadsheets, and some like traditional data bases, which require you to specify your parameters.

Data bases are some of the most versatile programs available on the market. But, they also can be the most frustrating to figure out. However, if you do your research well, you can wind up with software to serve your hobby and a variety of other needs.

An artsy approach. Lester B., a New York trial lawyer and art collector, "would dread having to write a program to do anything." So, he turned to *File Manager* (Atari, Inc., 1312 Crossman Rd., PO Box 61657, Sunnyvale, CA 94086) and his computer-savvy son-in-law. With a little help and encouragement, Lester and his wife, Francine, determined what fields of information they needed to maintain. They keep track of the title and type of artwork, the artist, the value, the date and place of purchase, and the current location of the piece. *File Manager* is easy to use whenever they buy, sell, or move a piece of artwork.

SOME HOBBY-SPECIFIC SOFTWARE

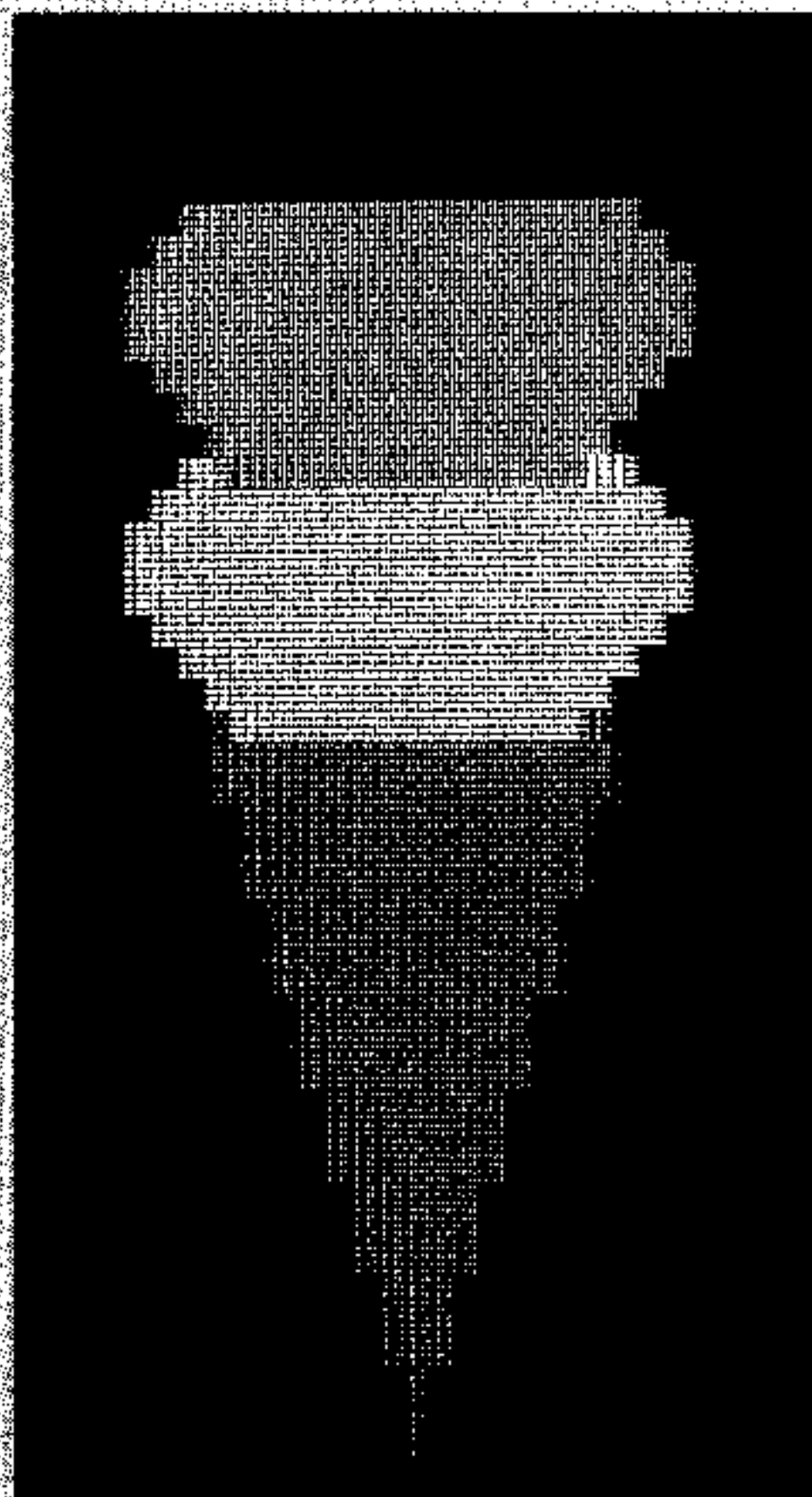
CATEGORY	MANUFACTURER/ADDRESS	PRODUCT NAME/PRICE	MODEL
Astrology	NAVARONE INDUSTRIES, INC. 510 Lawrence Expressway, Suite 800 Sunnyvale, CA 94086; (408) 866-8579	<i>Astrology Horoscope Maker</i> \$49.95	TI-99/4A, 32K (disk); IBM PC/PCjr, 128K (disk). Version planned for Commodore.
Astrology	ATARI PROGRAM EXCHANGE P.O. Box 3705 Santa Clara, CA 95055; (800) 538-1862	<i>Astrology</i> \$24.95	Atari 800/XL series, 40K (disk).
Bowling	CDE SOFTWARE 2463 McCready Los Angeles, CA 90039; (213) 661-2031	<i>Bowling League Secretary</i> \$59.95	Kaypro, Osborne, TRS-80 Models I/III/4 w/CP/M, 56K (disk).
Coin Collecting	COMPU-QUOTE 6914 Berquist Ave. Canoga Park, CA 91307; (213) 348-3662	<i>Inventory of Coins</i> \$95	Apple II/II plus/IIe, 48K (disk); IBM PC/PCjr, 64K (disk); TRS-80 Models I/III/4, 48K (disk).
Coin Collecting	SOFTSHOE ENTERPRISES 10959 Kane Ave. Whittier, CA 90604; (213) 944-5541	<i>CoinMasstore</i> \$59	Apple II/II plus/IIe, 48K (disk).
Crosswords	ARTSCI 5547 Satsuma Ave. N. Hollywood, CA 91601; (818) 985-5763	<i>Crosswords</i> \$24.95	Apple II/II plus/IIe, 48K (disk).
Genealogy	ACORN SOFTWARE PRODUCTS 353 W. Lancaster Ave. Radnor Square Wayne, PA 19087; (215) 964-9103	<i>Your Family Tree</i> \$29.95	IBM PC/PCjr, 128K (disk); TRS-80 Models III/4, 64K (disk).
Genealogy	MICHTRON 6855 Highland Pontiac, MI 48054; (313) 666-4800	<i>Family Tree</i> \$29.95	TRS-80 Models I/III/4, 48K (disk or cassette).
Genealogy	QUINSEPT, INC. P.O. Box 216 Lexington, MA 02173; (617) 862-0404	<i>Family Roots</i> \$185	ADAM, 48K (cassette); Apple II/II plus/IIe/III w/emulator, 48K (disk); IBM PC, 128K (disk).
General	SOFTSHOE ENTERPRISES 10959 Kane Ave. Whittier, CA 90604; (213) 944-5541	<i>Masstore Collector</i> \$49	Apple II/II plus/IIe, 48K (disk).
Golf	SYSTEMICS, INC. 3050 Spring St. W. Bloomfield, MI 48033; (313) 851-2504	<i>GolfCap</i> 49.95	IBM PC/PCjr (enhanced), 64K (disk).
Ham Radio	RAK ELECTRONICS P.O. Box 1585 Orange Park, FL 32067; (904) 264-6777	<i>Vic Morse II</i> , \$12.95 (VIC-20); <i>C 64 Morse II</i> , \$14.95 (C 64)	VIC-20 (cassette); Commodore 64 (cassette).
Record Collecting	MCGRAW-HILL 1221 Ave. of the Americas, Room 2688 New York, NY 10020; (609) 426-5245	<i>Record Collection Manager</i> \$29.95	Apple II plus/IIe, 64K (disk, CP/M, 80-column card); IBM PC/PCjr, 128K (disk); TRS-80 Models III/4, 48K (disk).
Stamp Collecting	SOFTSHOE ENTERPRISES 10959 Kane Ave. Whittier, CA 90604; (213) 944-5541	<i>StampMasstore</i> \$49	Apple II/II plus/IIe, 48K (disk).
Stamp and Coin Collecting	MCGRAW-HILL 1221 Ave. of the Americas, Room 2688 New York, NY 10020; (609) 426-5245	<i>Stamp & Coin Collection Manager</i> \$29.95	Apple II plus/IIe, 64K (disk, CP/M, 80-column card); IBM PC/PCjr, 128K (disk); TRS-80 Models III/4, 48K (disk).

ICE CREAM CONE

BY JOEY LATIMER

As you lie in your hammock on a hot summer's day, languidly fanning yourself with a copy of FAMILY COMPUTING, do you ever fantasize about eating a big, delicious, dripping ice cream cone? But does the thought of trudging through the hot streets to the neighborhood store require more energy than you can muster?

Well then, turn to your computer, select one of seven delicious flavors, and watch it dish up a treat that looks good enough to eat! (You may even get a surprise chocolate topping!)



Atari version of Ice Cream Cone.

ADAM/Ice Cream Cone

```

10 DIM scoop(2,22,2),cn(17,2),flav(8),fl$(8),ice(2)
20 FOR z = 1 TO 7
30 READ flav(z),fl$(z)
40 NEXT z
50 FOR x = 1 TO 2
60 FOR y = 24-12*x TO 33-11*x
70 FOR z = 1 TO 2
80 READ scoop(x,y,z)
90 NEXT z,y,x
100 FOR x = 1 TO 17
110 READ cn(x,1),cn(x,2)
120 NEXT x
130 TEXT
140 FOR x = 1 TO 7
150 PRINT x;" - ";fl$(x)
160 NEXT x
170 PRINT
180 PRINT "PLEASE PRESS THE NUMBER OF YOUR";"CHOICE."
190 FOR x = 1 TO 2
200 PRINT
210 PRINT "WHAT FLAVOR DO YOU WANT FOR";SPC(4);"SCOOP
#";x;"? ";
220 GET a$
230 IF a$ < "1" OR a$ > "7" THEN 220
240 PRINT a$
250 ice(x) = VAL(a$)
260 NEXT x
270 FOR d = 1 TO 200
280 NEXT d
290 GR
300 COLOR= 13
310 FOR ro = 1 TO 17
320 FOR co = cn(ro,1) TO cn(ro,2)
330 PLOT co,ro+22
340 NEXT co,ro
350 FOR z = 1 TO 2
360 COLOR= flav(ice(z))
370 FOR ro = 24-12*z TO 33-11*z
380 FOR co = scoop(z,ro,1) TO scoop(z,ro,2)

```

```

390 PLOT co,ro
400 NEXT co,ro,z
410 IF RND(1) > 0.5 OR ice(2) = 2 THEN 470
420 COLOR= 8
430 FOR co = scoop(2,0,1) TO scoop(2,0,2)
440 FOR ro = 0 TO RND(1)*15
450 PLOT co,ro
460 NEXT ro,co
470 FOR d = 1 TO 400
480 NEXT d
490 PRINT "PLEASE PRESS ANY KEY FOR","ANOTHER CONE.";
500 GET a$
510 GOTO 130
1000 DATA 15,VANILLA,8,CHOCOLATE,11,RASPBERRY,1,CHERRY
1010 DATA 14,BLUEBERRY,12,MINT,4,PISTACHIO
2000 DATA 15,23,14,24,13,25,13,25,12,26,12,26,12,26,12
2010 DATA 26,13,25,13,25,14,24,16,22,15,23,14,24,13,25
2020 DATA 13,25,12,26,12,26,12,26,12,26,13,25,13,25,13
2030 DATA 25,14,24,14,24,14,24,14,24,14,24,15,23,15,23
2040 DATA 16,22,16,22,16,22,17,21,17,21,17,21
2050 DATA 18,20,18,20,18,20,19,19,19,19

```

Apple/Ice Cream Cone

```

10 DIM SCOOP(2,22,2),CN(17,2),FLAV(8),FL$(8),ICE(2)
20 FOR I = 1 TO 29
30 READ S
40 POKE 767+I,S
50 NEXT I
60 FOR Z = 1 TO 7
70 READ FLAV(Z),FL$(Z)
80 NEXT Z
90 FOR X = 1 TO 2
100 FOR Y = 24-12*X TO 33-11*X
110 FOR Z = 1 TO 2
120 READ SCOOP(X,Y,Z)
130 NEXT Z,Y,X
140 FOR X = 1 TO 17
150 READ CN(X,1),CN(X,2)
160 NEXT X
170 TEXT
180 HOME
190 FOR X = 1 TO 7
200 PRINT X;" - ";FL$(X)
210 NEXT X
220 PRINT
230 PRINT "PLEASE PRESS THE NUMBER OF YOUR CHOICE."
240 FOR X = 1 TO 2
250 PRINT
260 PRINT "WHAT FLAVOR DO YOU WANT FOR SCOOP #";X;"? "
;
270 GET A$
280 IF A$ < "1" OR A$ > "7" THEN 270
290 PRINT A$
300 ICE(X) = VAL(A$)
310 NEXT X
320 FOR D = 1 TO 200
330 NEXT D
340 GR
350 COLOR= 13
360 FOR RO = 1 TO 17
370 FOR CO = CN(RO,1) TO CN(RO,2)
380 PLOT CO,RO+22
390 NEXT CO,RO
400 FOR Z = 1 TO 2
410 COLOR= FLAV(ICE(Z))
420 FOR RO = 24-12*Z TO 33-11*Z
430 FOR CO = SCOOP(Z,RO,1) TO SCOOP(Z,RO,2)
440 PLOT CO,RO
450 POKE 6,Z
460 POKE 8,240-CO*ICE(Z)
470 CALL 768
480 NEXT CO,RO,Z
490 IF RND(1) > 0.5 OR ICE(2) = 2 THEN 580
500 COLOR= 8

```

SUMMER PROGRAMS

```

520 NEXT CO,RO,Z
530 IF RND(1)>0.5 OR ICE(2)=2 THEN 610
539 REM --DRAW CHOCOLATE TOPPING--
540 FOR CO=SCOOP(2,0,1) TO SCOOP(2,0,2)
550 FOR RO=0 TO INT(RND(1)*10)
560 POKE S+1,RND(1)*29
570 POKE S,RO*3
580 POKE SB+CO+40*RO,160
590 POKE CB+CO+40*RO,9
600 NEXT RO,CO
610 POKE S+4,0
620 FOR D=1 TO 400
630 NEXT D
640 POKE 198,0
650 POKE 214,23
660 PRINT
670 PRINT TAB(4);"PRESS ANY KEY";TAB(22);"FOR ANOTHER
CONE.";
680 GET AS
690 IF AS="" THEN 680
700 GOTO 220
1000 DATA 1024,55296,54272
2000 DATA 1,VANILLA,9,CHOCOLATE,2,RASPBERRY,10,CHERRY
2010 DATA 6,BLUEBERRY,14,MINT,13,PISTACHIO
3000 DATA 15,23,14,24,13,25,13,25,13,25,14,24,15,23
3010 DATA 15,23,14,24,13,25,13,25,13,25,14,24,15,23
3020 DATA 15,23,15,23,16,22,16,22,17,21,17,21,17
3030 DATA 21,17,21,18,20,18,20,19,19

```

IBM PC w/Color Graphics Adapter & IBM PCjr/Ice Cream Cone

```

10 DIM SCOOP(2,12,2),CN(11,2),FLAV(8),FL$(8),ICE(2)
20 SCREEN 0,0
30 COLOR 7,0
40 WIDTH 40
50 LOCATE ,,0
60 KEY OFF
70 RANDOMIZE
80 FOR Z=1 TO 7
90 READ FLAV(Z),FL$(Z)
100 NEXT Z
110 FOR X=1 TO 2
120 FOR Y=12-6*X TO 19-7*X
130 FOR Z=1 TO 2
140 READ SCOOP(X,Y,Z)
150 NEXT Z,Y,X
160 FOR X=1 TO 11
170 READ CN(X,1),CN(X,2)
180 NEXT X
189 REM --ASK FOR FLAVORS--
190 CLS
200 FOR X=1 TO 7
210 PRINT X;"- ";FL$(X)
220 NEXT X
230 PRINT
240 PRINT "PLEASE PRESS THE NUMBER OF YOUR CHOICE."
250 FOR X=1 TO 2
260 PRINT
270 PRINT "WHAT FLAVOR DO YOU WANT FOR SCOOP #";CHR$(X
+48);"? ";
280 AS=INKEY$
290 IF AS<"1" OR AS>"7" THEN 280
300 PRINT AS
310 ICE(X)=VAL(AS)
320 NEXT X
330 FOR D=1 TO 400
340 NEXT D
349 REM --DRAW CONE--
350 CLS
360 COLOR 6,0
370 FOR RO=1 TO 11
380 FOR CO=CN(RO,1) TO CN(RO,2)
390 LOCATE RO+13,CO

```

```

400 PRINT "X";
410 NEXT CO,RO
419 REM --DRAW SCOOPS--
420 FOR Z=1 TO 2
430 FOR RO=12-6*Z TO 19-7*Z
440 FOR CO=SCOOP(Z,RO,1) TO SCOOP(Z,RO,2)
450 COLOR FLAV(ICE(Z)),0
460 LOCATE RO+1,CO
470 SOUND 100*CO,.5
480 PRINT CHR$(219);
490 NEXT CO,RO,Z
500 IF RND>.5 OR ICE(2)=3 THEN 580
510 COLOR 6,0
520 FOR CO=SCOOP(2,0,1) TO SCOOP(2,0,2)
530 FOR RO=1 TO RND*12
540 LOCATE RO,CO
550 SOUND RO*100+200,.5
560 PRINT CHR$(219);
570 NEXT RO,CO
580 FOR D=1 TO 800
590 NEXT D
600 COLOR 7,0
610 LOCATE 25,2
620 PRINT "PLEASE PRESS ANY KEY FOR ANOTHER CONE.";
630 AS=INKEY$
640 IF AS="" THEN 630 ELSE 190
1000 DATA 14,BUTTERSCOTCH,4,CHERRY,6,CHOCOLATE
1010 DATA 2,MINT,10,PISTACHIO,12,RASPBERRY,7,VANILLA
2000 DATA 15,23,14,24,13,25,13,25,13,25,14,24,15,23
2010 DATA 15,23,14,24,13,25,13,25,13,25,14,24,15,23
2020 DATA 16,22,16,22,17,21,17,21,17,21,17
2030 DATA 21,18,20,18,20,18,20,19,19

```

TI-99/4A/Ice Cream Cone

```

10 DIM SCOOP(2,13,2),CN(10,2),FLAV(8),FS(8),ICE(2)
20 CALL CLEAR
30 AS="FFFFFFFFFFFFFFFF"
40 CALL CHAR(128,AS)
50 CALL CHAR(136,"8142241818244281")
60 CALL CHAR(144,AS)
70 CALL CHAR(152,AS)
80 CALL COLOR(13,11,1)
90 CALL COLOR(14,11,1)
100 FOR Z=1 TO 7
110 READ FLAV(Z),FS(Z)
120 NEXT Z
130 FOR X=1 TO 2
140 FOR Y=14-6*X TO 19-6*X
150 FOR Z=1 TO 2
160 READ SCOOP(X,Y,Z)
170 NEXT Z
180 NEXT Y
190 NEXT X
200 FOR X=1 TO 10
210 READ CN(X,1),CN(X,2)
220 NEXT X
230 FOR I=1 TO 8
240 CALL COLOR(I,15,1)
250 NEXT I
260 CALL SCREEN(2)
270 CALL CLEAR
280 FOR X=1 TO 7
290 PRINT X;"- ";FS(X)
300 NEXT X
310 PRINT
320 PRINT "PLEASE PRESS THE NUMBER OF","YOUR CHOICE."
330 FOR X=1 TO 2
340 PRINT
350 PRINT "WHAT FLAVOR DO YOU WANT FOR SCOOP #";CHR$(X
+48);"? ";
360 CALL KEY(3,K,P)
370 IF (K<49)+(K>55) THEN 360
380 ICE(X)=K-48
390 PRINT ICE(X)

```

SUMMER PROGRAMS

```
400 NEXT X
410 FOR D=1 TO 100
420 NEXT D
430 CALL CLEAR
440 FOR RO=1 TO 10
450 FOR CO=CN(RO,1) TO CN(RO,2)
460 CALL HCHAR(RO+13,CO,136)
470 NEXT CO
480 NEXT RO
490 FOR Z=1 TO 2
500 CALL COLOR(14+Z,FLAV(ICE(Z)),1)
510 FOR RO=14-6*Z TO 19-6*Z
520 FOR CO=SCOOP(Z,RO,1) TO SCOOP(Z,RO,2)
530 CALL SOUND(1,CO*CO+200,2)
540 CALL HCHAR(RO,CO,136+8*Z)
550 NEXT CO
560 NEXT RO
570 NEXT Z
580 RANDOMIZE
590 IF (RND>.5)+(ICE(2)=2) THEN 670
600 FOR CO=SCOOP(2,2,1) TO SCOOP(2,2,2)
610 RANDOMIZE
620 FOR RO=2 TO 10*RND+2
630 CALL SOUND(150,RO*50+90,1)
640 CALL HCHAR(RO,CO,128)
650 NEXT RO
660 NEXT CO
670 PRINT "PRESS ANY KEY FOR ANOTHER.";
680 CALL KEY(3,K,P)
690 IF P=0 THEN 680 ELSE 260
1000 DATA 16,VANILLA,11,CHOCOLATE,9,RASPBERRY,7,CHERRY
1010 DATA 5,BLUEBERRY,4,MINT,3,PISTACHIO
2000 DATA 12,20,11,21,10,22,10,22,11,21,12,20
2010 DATA 13,19,12,20,11,21,11,21,12,20
2020 DATA 13,19,12,20,13,19,13,19,14,18
2030 DATA 14,18,14,18,15,17,15,17,16,16,16,16
```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Ice Cream Cone

```
10 SLOW
20 PRINT "1 - CHOCOLATE"
30 PRINT "2 - PEANUT BUTTER FUDGE"
40 PRINT "3 - BUTTERSCOTCH"
50 PRINT "4 - PEPPERMINT"
60 PRINT "5 - MOLASSES LACE"
70 PRINT "6 - CANDY STRIPE"
80 PRINT "7 - CHOCOLATE CHIP"
90 PRINT
100 PRINT "PLEASE PRESS THE NUMBER OF YOUR CHOICE."
110 FOR X=1 TO 2
120 PRINT
130 PRINT "WHAT FLAVOR DO YOU WANT"
140 PRINT "FOR SCOOP NUMBER ";X;"? "
150 LET RS=INKEY$
160 IF RS="" THEN GOTO 150
170 IF CODE RS<29 OR CODE RS>35 THEN GOTO 150
180 PRINT RS
190 LET R=VAL RS+127
200 IF R=129 THEN LET R=137
210 IF R=132 THEN LET R=10
220 IF X=1 THEN LET IS=CHR$ R
230 IF X=2 THEN LET JS=CHR$ R
240 NEXT X
250 CLS
260 LET A=15
270 LET B=A
280 FOR R=20 TO 11 STEP -2
290 FOR C=A TO B
300 PRINT AT R,C;CHR$ 136
310 PRINT AT R-1,C;CHR$ 136
320 NEXT C
330 LET A=A-1
340 LET B=B+1
```

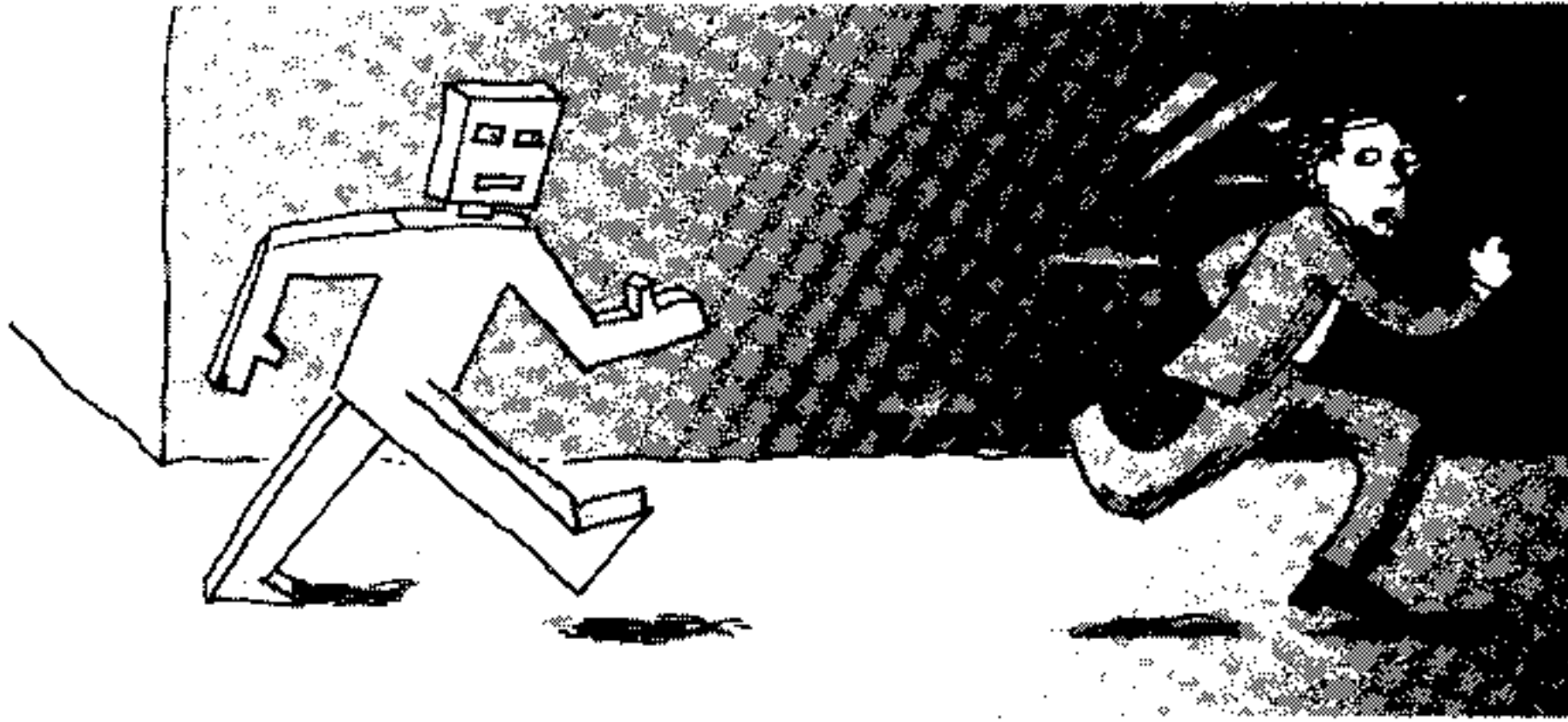
```
350 NEXT R
360 FOR C=9 TO 21
370 PRINT AT 7,C;IS
380 PRINT AT 8,C;IS
390 IF C<10 OR C>20 THEN GOTO 420
400 PRINT AT 6,C;IS
410 PRINT AT 9,C;IS
420 IF C<11 OR C>19 THEN GOTO 450
430 PRINT AT 5,C;IS
440 PRINT AT 10,C;IS
450 NEXT C
460 FOR C=10 TO 20
470 PRINT AT 2,C;JS
480 PRINT AT 3,C;JS
490 IF C<11 OR C>19 THEN GOTO 520
500 PRINT AT 1,C;JS
510 PRINT AT 4,C;JS
520 IF C<12 OR C>18 THEN GOTO 540
530 PRINT AT 0,C;JS
540 NEXT C
550 PAUSE 123
560 PRINT AT 21,1;"PRESS ANY KEY FOR ANOTHER CONE."
570 LET RS=INKEY$
580 IF RS="" THEN GOTO 570
590 CLS
600 GOTO 20
```

TRS-80 Color Computer/Ice Cream Cone

```
10 DIM SCOOP(2,8,2),CN(8,2),FLAV(8),FL$(8),ICE(2)
20 FOR Z=1 TO 7
30 READ FLAV(Z),FL$(Z)
40 NEXT Z
50 FOR X=1 TO 2
60 FOR Y=8-4*X TO 11-4*X
70 FOR Z=1 TO 2
80 READ SCOOP(X,Y,Z)
90 NEXT Z,Y,X
100 FOR X=1 TO 7
110 READ CN(X,1),CN(X,2)
120 NEXT X
130 CLS
140 FOR X=1 TO 7
150 PRINT X;"- ";FL$(X)
160 NEXT X
170 PRINT "PLEASE PRESS THE NUMBER OF YOUR CHOICE."
180 FOR X=1 TO 2
190 PRINT CHR$(13);"WHAT FLAVOR DO YOU WANT"
200 PRINT "FOR SCOOP #";CHR$(X+48);"? ";
210 AS=INKEY$
220 IF AS<"1" OR AS>"7" THEN 210
230 PRINT AS
240 ICE(X)=VAL(AS)
250 NEXT X
260 FOR D=1 TO 300
270 NEXT D
280 CLS(0)
290 FOR RO=1 TO 7
300 FOR CO=CN(RO,1) TO CN(RO,2)
310 PRINT@CO+32*(RO+7),CHR$(151);
320 NEXT CO,RO
330 FOR Z=1 TO 2
340 FOR RO=8-4*Z TO 11-4*Z
350 FOR CO=SCOOP(Z,RO,1) TO SCOOP(Z,RO,2)
360 SOUND RO+CO*10,1
370 PRINT@CO+32*RO,CHR$(143+FLAV(ICE(Z)));
380 NEXT CO,RO,Z
390 IF RND(0)>.5 OR ICE(2)=1 THEN 450
400 FOR CO=SCOOP(2,0,1) TO SCOOP(2,0,2)
410 FOR RO=D TO RND(5)
420 SOUND RO*10+100,1
430 PRINT@CO+32*RO,CHR$(207);
440 NEXT RO,CO
450 FOR D=1 TO 600
```

RENEGADE ROBOT

BY JOEY LATIMER



The top-secret building where you work is guarded by a robot. One day you arrive at work and find the robot missing. Puzzled, you enter the building and immediately sense that something has gone wrong. Strange noises are coming from a distant corridor. You investigate and discover that it's the sound of the robot, twirling around in circles and crashing into walls. "Its wires must have snapped!" you think to yourself. "It's gone completely berserk!"

The instant the robot senses your presence it starts coming after you, red eyes flashing madly. Your only hope is to reach the center of the building

and turn off the power switch that controls the robot before it catches you. It won't be easy: The robot is smart and knows not only the floorplan by heart, but also why you're heading toward the building's center. You'd better get started; time is running out.

You can thwart the *Renegade Robot* with either your joystick (plug it into port #1) or your keyboard. Press the following keys to move: "U" (up left); "I" (up center); "O" (up right); "J" (left); "L" (right); "M" (down left); comma (down center); and period (down right). Elapsed time is recorded on the screen; the highest score will be displayed.

ADAM/Renegade Robot

```

10 GR
20 READ s,hr,hc,f
30 COLOR= 3
40 PLOT 19,17
50 PLOT 19,18
60 PLOT 20,17
70 PLOT 20,18
80 COLOR= 7
90 FOR x = 1 TO 24
100 READ a,b,c
110 FOR y = a TO b
120 IF x <= 12 THEN PLOT c,y:GOTO 140
130 PLOT y,c
140 NEXT y
150 NEXT x
160 h1 = INT(RND(1)*22)
170 h2 = INT(RND(1)*8)+32*(RND(1)>.5)
180 VTAB 22
190 HTAB 15
200 PRINT s;" "
210 s = s-1
    
```

```

220 j = PDL(5)
230 ro = h1+(j = 4 OR j = 6 OR j = 12)-(j = 1 OR j = 3
    OR j = 9)
240 co = h2+(j = 2 OR j = 3 OR j = 6)-(j = 8 OR j = 9
    OR j = 12)
250 ro = ro-(ro > 39)+(ro < 0)
260 co = co-(co > 39)+(co < 0)
270 IF SCRN(co,ro) = 7 THEN ro = h1:co = h2:GOTO 350
280 COLOR= 0
290 PLOT h2,h1
300 COLOR= 13
310 PLOT co,ro
320 h1 = ro
330 h2 = co
340 IF (ro = 17 OR ro = 18) AND (co = 19 OR co = 20) T
    HEN 530
350 ra = hr+(ro > hr)-(ro < hr)
360 ca = hc+(co > hc)-(co < hc)
370 ra = ra-(ra > 39)+(ra < 0)
380 ca = ca-(ca > 39)+(ca < 0)
390 IF SCRN(ca,ra) <> 3 AND SCRN(ca,ra) <> 7 THEN 450
400 d = 2*INT(RND(1)*2)-1
410 IF f THEN ra = hr+d:ca = hc:GOTO 430
420 ca = hc+d:ra = hr
430 f = NOT f
440 GOTO 370
450 COLOR= 0
460 PLOT hc,hr
470 COLOR= 11
480 PLOT ca,ra
490 hc = ca
500 hr = ra
510 IF ca = co AND ra = ro THEN 610
520 GOTO 180
530 TEXT
540 IF s > hs THEN hs = s
550 FOR t = 1 TO 50
560 PRINT CHR$(7);"YOU DID IT! ";
570 NEXT t
580 HOME
590 PRINT "YOUR SCORE IS ";s;"."
600 GOTO 630
610 TEXT
620 PRINT CHR$(7);"SORRY, YOU WERE CAUGHT!"
630 PRINT "THE HIGH SCORE IS ";hs;"."
640 PRINT "PRESS <RETURN> TO PLAY AGAIN.";
650 GET k$
660 IF k$ <> CHR$(13) THEN 660
670 RESTORE
680 GOTO 10
1000 DATA 1000,25,20,0
2000 DATA 6,18,8,20,33,8,12,13,12,15,24,12,26
2010 DATA 27,12,16,22,16,16,22,23,12,13,27,15
2020 DATA 24,27,26,27,27,6,18,31,20,33,31,10,19
2030 DATA 6,12,29,6,12,14,12,16,23,12,25,27,12
2040 DATA 16,23,16,18,21,22,12,14,27,16,23,27
2050 DATA 25,27,27,10,19,33,21,29,33
    
```

Apple/Renegade Robot

```

10 TEXT
20 HOME
30 PRINT "DO YOU WANT TO USE THE <K>EYBOARD"
40 PRINT "OR THE <J>OYSTICK?";
50 GET K$
60 IF K$ <> "K" AND K$ <> "J" THEN 50
70 KB = (K$ = "J")
80 HOME
90 GR
100 READ S,HR,HC,F
110 COLOR= 3
120 PLOT 19,17
130 PLOT 19,18
140 PLOT 20,17
150 PLOT 20,18
    
```

ILLUSTRATIONS BY JOSEF COSFIELD

SUMMER PROGRAMS

```

210 IF X<=12 THEN LOCATE Y,C ELSE LOCATE C,Y
220 PRINT CHR$(219);
230 NEXT Y,X
240 H1=INT(RND*22)+1
250 H2=INT(RND*6)+1-32*(RND>.5)
260 COLOR 2
270 LOCATE 23,18
280 PRINT S;" ";
290 S=S-1
300 IF KB=0 THEN 360
310 JO=STICK(0)
320 J1=STICK(1)
330 RO=H1+(J1<35)-(J1>50)
340 CO=H2+(JO<50)-(JO>65)
350 GOTO 420
360 J$=INKEY$
370 IF J$="" THEN J=0:GOTO 400
380 J=ASC(J$)
390 POKE 1050,PEEK(1052)
400 RO=H1-(J=44 OR J=46 OR J=77)+(J=73 OR J=79 OR J=85)
)
410 CO=H2-(J=46 OR J=76 OR J=79)+(J=74 OR J=77 OR J=85)
)
420 RO=RO+(RO>22)-(RO<1)
430 CO=CO+(CO>40)-(CO<1)
440 SC=SCREEN(RO,CO,1) MOD 16
450 IF SC=2 THEN RO=H1:CO=H2:GOTO 530
460 COLOR 0
470 LOCATE H1,H2:PRINT CHR$(2);
480 COLOR 4
490 LOCATE RO,CO:PRINT CHR$(2);
500 H1=RO
510 H2=CO
520 IF RO=10 AND (CO=19 OR CO=20) THEN 700
530 RA=HR-(RO>HR)+(RO<HR)
540 CA=HC-(CO>HC)+(CO<HC)
550 RA=RA+(RA>22)-(RA<1)
560 CA=CA+(CA>40)-(CA<1)
570 CH=SCREEN(RA,CA,1) MOD 16
580 IF CH<>2 AND CH<>3 THEN 630
590 D=2*INT(RND*2)-1
600 IF F THEN RA=HR+D:CA=HC ELSE CA=HC+D:RA=HR
610 F=NOT F
620 GOTO 550
630 COLOR 0
640 LOCATE HR,HC:PRINT CHR$(15);
650 COLOR 6
660 LOCATE RA,CA:PRINT CHR$(15);
670 HR=RA
680 HC=CA
690 IF CA=CO AND RA=RO THEN 800 ELSE 270
700 CLS
710 COLOR 7
720 IF S>HS THEN HS=S
730 FOR T=1 TO 75
740 PRINT "YOU DID IT! ";
750 SOUND 440+(T*2),1
760 NEXT T
770 CLS
780 PRINT "YOUR SCORE IS";S;CHR$(29);"."
790 GOTO 840
800 CLS
810 COLOR 7
820 SOUND 440,5
830 PRINT "SORRY, YOU WERE CAUGHT!"
840 PRINT "THE HIGH SCORE IS";HS;CHR$(29);"."
850 PRINT "PRESS <ENTER> TO PLAY AGAIN.";
860 IF INKEY$<>CHR$(13) THEN 860 ELSE RESTORE
870 GOTO 130
1000 DATA 1000,13,19,0
2000 DATA 2,9,7,11,19,7,6,7,11,9,12,11,14,15,11,9,12
2010 DATA 16,9,12,23,6,7,28,9,12,28,14,15,28,2,9,32
2020 DATA 11,19,32,9,19,2,21,30,2,12,13,6,15,24,6
2030 DATA 26,27,6,17,22,9,18,21,12,12,13,15,15,24,15
2040 DATA 26,27,15,9,19,19,21,30,19

```

TI-99/4A / Renegade Robot

```

10 CALL CLEAR
20 PRINT "MAKE SURE THE <ALPHA LOCK>","KEY IS UP!"
30 PRINT
40 PRINT "DO YOU WANT TO USE THE"
50 PRINT "<K>EYBOARD OR THE","<J>OYSTICK?"
60 CALL KEY(3,KB,P)
70 IF (KB<>ASC("J"))*(KB<>ASC("K")) THEN 60
80 KB=(KB=ASC("J"))
90 CALL CLEAR
100 CALL SCREEN(2)
110 FOR KS=12 TO 16
120 READ KH,ST$,FG,BG
130 CALL CHAR(KH,ST$)
140 CALL COLOR(KS,FG,BG)
150 NEXT KS
160 READ S,HR,HC
170 CALL HCHAR(12,16,152,2)
180 FOR X=1 TO 24
190 READ A,B,C
200 FOR Y=A TO B
210 IF X>12 THEN 240
220 CALL HCHAR(Y,C,128)
230 GOTO 250
240 CALL HCHAR(C,Y,128)
250 NEXT Y
260 NEXT X
270 H1=INT(RND*22)+1
280 H2=INT(RND*3)-28*(RND>.5)+1
290 RO=H1
300 CO=H2
310 S=S-1
320 IF KB=0 THEN 370
330 CALL JOYST(1,J1,J2)
340 RO=RO-(J2=-4)+(J2=4)
350 CO=CO-(J1=4)+(J1=-4)
360 GOTO 400
370 CALL KEY(3,J,P)
380 RO=H1-((J=44)+(J=46)+(J=77))+((J=73)+(J=79)+(J=85))
)
390 CO=H2-((J=46)+(J=76)+(J=79))+((J=74)+(J=77)+(J=85))
)
400 RO=RO+(RO>24)-(RO<1)
410 CO=CO+(CO>32)-(CO<1)
420 CALL GCHAR(RO,CO,SC)
430 IF SC<>128 THEN 470
440 RO=H1
450 CO=H2
460 GOTO 520
470 CALL HCHAR(H1,H2,120)
480 CALL HCHAR(RO,CO,136)
490 H1=RO
500 H2=CO
510 IF SC=152 THEN 730
520 RA=HR-(RO>HR)+(RO<HR)
530 CA=HC-(CO>HC)+(CO<HC)
540 RA=RA+(RA>24)-(RA<1)
550 CA=CA+(CA>32)-(CA<1)
560 CALL GCHAR(RA,CA,CH)
570 IF (CH<>128)*(CH<>152) THEN 670
580 D=2*INT(RND*2)-1
590 IF F=0 THEN 630
600 RA=HR+D
610 CA=HC
620 GOTO 650
630 CA=HC+D
640 RA=HR
650 F=1+(F>0)
660 GOTO 540
670 CALL HCHAR(HR,HC,120)
680 CALL HCHAR(RA,CA,144)
690 HR=RA
700 HC=CA
710 IF (CA=CO)*(RA=RO) THEN 860
720 GOTO 310
730 CALL CLEAR
740 CALL SCREEN(12)

```

```

GOTO 220
210 POKE SC+Y+22*C,160:POKE CL+Y+22*C,6
220 NEXT Y
230 NEXT X
240 H1=INT(RND(1)*21)
250 H2=INT(RND(1)*2)-20*(RND(1)>.5)
260 PRINT CHR$(19);R$;TAB(8);STR$(S);" ";
270 S=S-1
280 IF KB=0 THEN 360
290 POKE 37154,127
300 J=PEEK(37152) AND 128
310 POKE 37154,255
320 J=J OR (PEEK(37137) AND 127)
330 RO=H1+SGN(J AND 4)-SGN(J AND 8)
340 CO=H2+SGN(J AND 16)-SGN(J AND 128)
350 GOTO 410
360 GET JS
370 IF JS="" THEN J=0:GOTO 390
380 J=ASC(JS)
390 RO=H1-(J=44 OR J=46 OR J=77)+(J=73 OR J=79 OR J=85)
)
400 CO=H2-(J=46 OR J=76 OR J=79)+(J=74 OR J=77 OR J=85)
)
410 RO=RO+(RO>21)-(RO<0)
420 CO=CO+(CO>21)-(CO<0)
430 IF PEEK(SC+CO+22*RO)=160 THEN RO=H1:CO=H2:GOTO 510
440 POKE SC+H2+22*H1,42
450 POKE CL+H2+22*H1,0
460 POKE SC+CO+22*RO,42
470 POKE CL+CO+22*RO,7
480 H1=RO
490 H2=CO
500 IF RO=9 AND (CO=10 OR CO=11) THEN 700
510 RA=HR-(RO>HR)+(RO<HR)
520 CA=HC-(CO>HC)+(CO<HC)
530 RA=RA+(RA>21)-(RA<0)
540 CA=CA+(CA>21)-(CA<0)
550 CH=PEEK(SC+CA+22*RA)
560 IF CH<>160 AND CH<>102 THEN 620
570 D=2*INT(RND(1)*2)-1
580 IF F THEN RA=HR+D:CA=HC:GOTO 600
590 CA=HC+D:RA=HR
600 F=NOT F
610 GOTO 530
620 POKE SC+HC+22*HR,81
630 POKE CL+HC+22*HR,0
640 POKE SC+CA+22*RA,81
650 POKE CL+CA+22*RA,2
660 HR=RA
670 HC=CA
680 IF CA=CO AND RA=RO THEN 790
690 GOTO 260
700 PRINT CHR$(147);
710 IF S>HS THEN HS=S
720 POKE 36878,7
730 FOR T=180 TO 255
740 PRINT "YOU DID IT! ";
750 POKE 36876,T
760 NEXT T
770 PRINT CHR$(147);"YOUR SCORE IS";S;CHR$(157);"."
780 GOTO 820
790 POKE 36878,10
800 POKE 36876,235
810 PRINT CHR$(147);"YOU WERE CAUGHT!"
820 PRINT "HIGH SCORE IS";HS;CHR$(157);"."
830 PRINT "PRESS <RETURN> TO","PLAY AGAIN.";
840 POKE 36878,0
850 GET KS
860 IF KS<>CHR$(13) THEN 850
870 RESTORE
880 GOTO 90
1000 DATA 7680,38400,1000,16,7,0
2000 DATA 2,10,2,12,20,2,5,6,5,8,14,5,16,17
2010 DATA 5,8,14,8,8,14,13,5,6,16,8,14,16,16
2020 DATA 17,16,2,10,19,12,20,19,4,9,2,11,17
2030 DATA 2,6,6,5,8,13,5,15,15,5,8,13,8,10,11
2040 DATA 14,6,6,17,8,13,17,15,15,17,4,9,20
2050 DATA 11,17,20

```

PROGRAMMING P.S.

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

CORRECTIONS . . .

ADAM/Recipe for Disaster (June, page 98)

The expression NEXT I appears in both line 380 and line 390. It should only be in line 380; thus, line 390 should read

```
390 FOR d=1 TO 200:NEXT d:GOTO 210
```

ADAM/Mystery Manor (March, page 109)

In addition to the modifications indicated, you must also change line 330 to read as follows:

```
330 FOR I=1 TO 10:PRINT G(I);:FLAG=FLAG+(G(I)◇INT(SQR(GU(I)-9))):NEXT I:PRINT
```

Apple/Phone Cost Monitor (May, pages 64-65)

Lines 920, 930, and 1080 are incorrect as published. They should read as follows:

```
920 IF S$ = "1" THEN PRINT "YOUR MONEY IS SPENT!"
```

```
930 IF S$ = "2" THEN PRINT "TIME'S UP!"
```

```
1080 IF PEEK(-16384) < 128 THEN 990
```

Apple/Mystery Gadget (May, page 88)

In addition to the modifications indicated, you must also change line 510 of the Model 4 version to read as follows:

```
510 GET KS:GOTO 100
```

Atari/Recipe for Disaster (June, pages 96, 98)

Unless you use some of the Atari's tricks for entering extra-long lines, it won't let you type in a program line that's more than 114 characters long. Line 400 of *Recipe for Disaster* has 132 characters. One way to get around this problem is to break it up into two lines, like so:

```
400 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND 2,0,0,0:NEXT Y:F
OR D=1 TO 200:NEXT D:NEXT X
```

```
405 SOUND 0,90,8,15:FOR D=1 TO 10:NEXT D:SOUND 0,0,0,0
```

TI-99/4A/Disk Label Maker (June, page 78)

This program requires TI Extended BASIC.

TI-99/4A w/TI Extended BASIC/Recipe for Disaster (June, page 101)

The semicolon in line 110 should be a colon:

```
110 INPUT "YOUR NAME, PLEASE? ":NS::IF NS="" THEN 110
```

. . . AND ENHANCEMENTS

We encourage you to try translating our programs for other computers—especially the reader-written programs, which appear each month for only one computer. If you're willing, we'll publish your name and address here so that other owners of your brand of computer can write you (with a stamped, self-addressed envelope, of course) for copies of your translation.

A YEAR TO REMEMBER

BY PETER FAVARO

"MAN SNATCHED BY UFO!" was the headline on page two of the local paper. Just before the man disappeared, his wife, Mrs. Harry Winkler, reports, they were sitting quietly at home watching TV. All of a sudden she noticed her oven door opening and closing and the hands on her kitchen clock spinning wildly. Their dog, Bubba, "was turning somersaults and running around in circles in the backyard." Mrs. Winkler went outside to investigate and noticed mysterious red, blue, and green lights flickering across the sky. When she returned inside, Harry was gone. "I never saw anything like it!" Mrs. Winkler is quoted as saying. "Bub-

ba's been so depressed ever since Harry's not been around to take him on his nightly stroll."

MEANWHILE, LIGHT-YEARS AWAY...

The Outer People are a peaceful and scholarly race who live on a small planet tucked away in a dark corner of our galaxy. They are obsessed with keeping track of every fact and fad in the Milky Way's history and have developed a technique of traveling through time at high speeds to collect "samplings" from various planets. Although they always make a point of returning their "sampling" right back to the precise year when it was collected so as not to disturb the natural order of things, sometimes they goof. Such was the case with Mr. Harry Winkler. The Outer People simply couldn't remember which year they snatched him from.

Although the Outer People can't communicate directly with Mr. Winkler,

fortunately, they have constructed a machine to get them out of sticky situations such as this one. With their "Thought Recorder, Model XIV," the Outer People can view memories locked in Mr. Winkler's brain. By matching his memories of his final moment on earth with their detailed knowledge of the planet's history, they can piece together what year Mr. Winkler should be returned to.

HOW TO PLAY

First, set the Thought Recorder, Model XIV (your computer) to all uppercase letters and turn the volume up. Next, select the memory zone you wish to view (see illustration, below). Type in the first letter of the zone (for example, "A" for Audio). A memory concerning sound will appear on the screen. Type "A" again and a different memory may appear. To ensure that you have viewed every memory concerning sound, press the "A" key several

times before moving on to a different zone.

Pay particular attention to the strength signals accompanying each memory. A long flashing line indicates Mr. Winkler's final memories on earth, while a short flashing line refers to a less recent memory lodged deeper in his mind. Only the former are pertinent; they should be jotted down on paper.

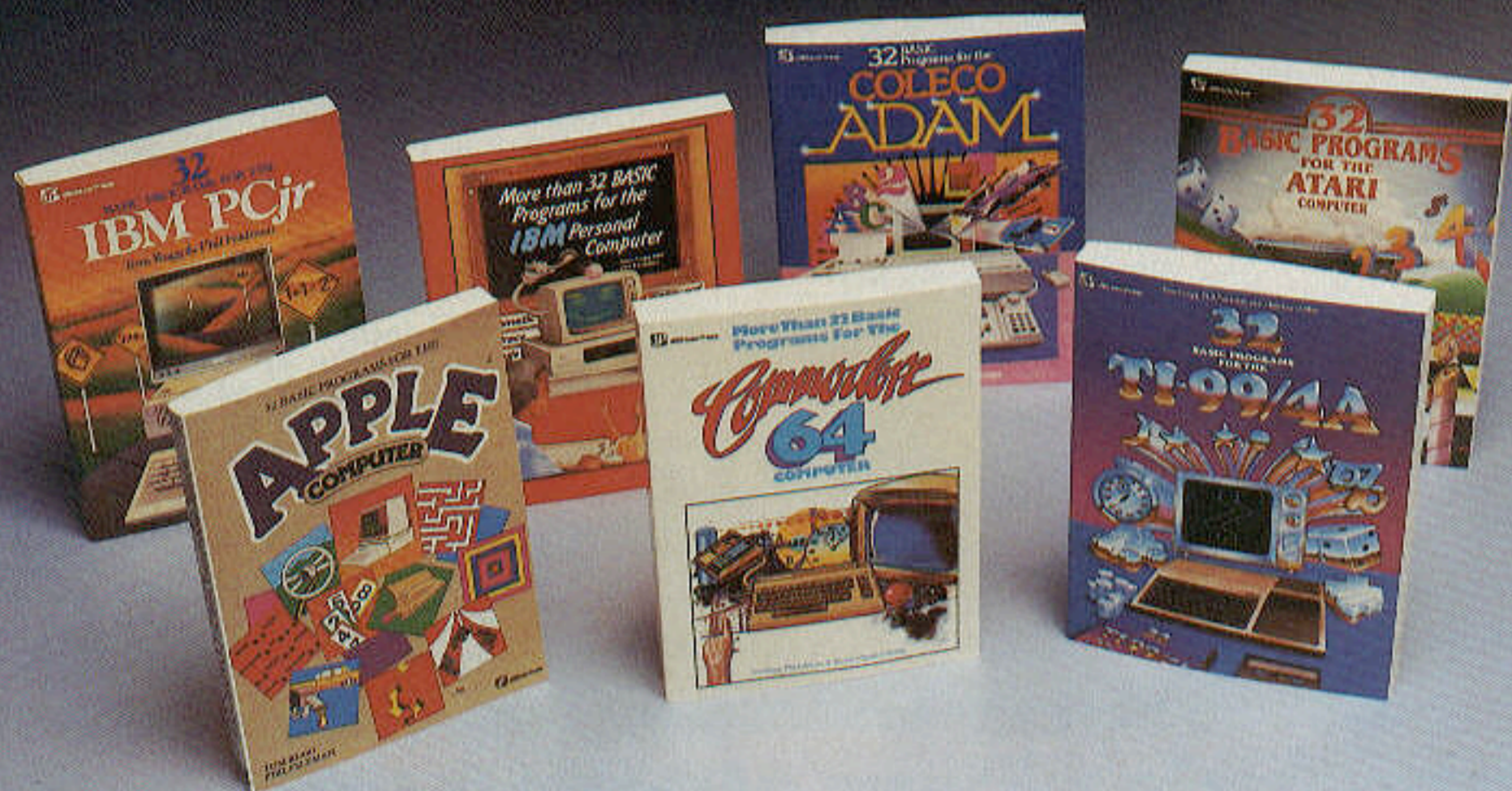
Remember that Mr. Winkler was last seen on earth watching television, so his final memories will be partly a direct recollection of what was on the screen in front of him, and partly his own loose associations with the events he was viewing. Once you figure out what Mr. Winkler was watching on TV, and the corresponding year, type "G" to guess. Then input the year (use digits). If you guess an incorrect year, you can get a helpful clue by typing "H" for help. The solution to *Brain Terrain* will appear in next month's issue.

PETER FAVARO, PH.D., is an education and recreation video game design consultant whose fondest recent memory is marrying his wife, Theresa. He is currently writing a book on educational computing for Prentice-Hall and is the author of the June puzzle.



ILLUSTRATION BY JOSH GOSFIELD

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ILLUSTRATION BY JOHN GOSFIELD

PUZZLE

**Base Version (TRS-80 Color Computer)/
Brain Terrain**

```

10 CLEAR 900: DIM AS(11,4), N(11): WL=32: GW=0: M=0: QS="" : C
LS
40 ES=CHR$(34): BL$=STRING$(WL,32): ST$=STRING$(WL,42)
50 READ VS: FOR X=1 TO 11: READ N(X): FOR Y=1 TO N(X)
60 READ DS: C=ASC(LEFT$(DS,1))-64
70 FOR Z=2 TO LEN(DS): N=ASC(MID$(DS,Z,1))-C
80 AS(X,Y)=AS(X,Y)+CHR$(N-26*(N<65 AND N+C>64))
90 NEXT Z: NEXT Y: NEXT X
100 CLS: RS="THOUGHT RECORDER, MODEL XIV": GOSUB 1000
110 RS="(PATENT PENDING)": GOSUB 1000
120 PRINT: RS="PRESS A ZONE KEY (A, B, C, E, F, M, P, S,
T, OR V) TO ACCESS MEMORY"
130 IF GW=1 THEN RS=RS+", "+ES+"H"+ES+" FOR HELP,"
140 RS=RS+" OR "+ES+"G"+ES+" TO GUESS.": GOSUB 1000
160 TB=INT((WL-LEN(QS))/2)
170 IF M=1 THEN NS=RND(TB) ELSE NS=RND(3)
180 NS=LEFT$(ST$,NS)+QS+RIGHT$(ST$,NS)
190 PRINT@10*WL, BL$: PRINT@10*WL, "": GOSUB 2000
200 K$=INKEY$: IF K$="" THEN 170
210 IF K$="G" THEN 260
220 IF K$="H" AND GW=1 THEN 370
230 FL=0: FOR X=1 TO 10: IF MID$(VS,X,1)=K$ THEN FL=X: X=
10
240 NEXT X: IF FL=0 THEN 170
250 M=RND(N(FL)): QS=AS(FL,M): GOTO 160
260 CLS: FOR X=1 TO 128 STEP 4: SOUND X,1: NEXT X
270 RS="SPACE/TIME MACHINE ACTIVE.": GOSUB 1000
280 PRINT: PRINT: PRINT: PRINT "INPUT YEAR":
290 INPUT Y$: IF Y$<>AS(11,1) THEN GW=1: GOTO 340
300 CLS: FOR X=1 TO 50: SOUND 40+RND(40),1: SOUND 200+RND
(40),1: NEXT X
310 NS="WHOOOOSH!": PRINT@8*WL, "": GOSUB 2000
320 PRINT: PRINT: RS="SUBJECT RETURNED HOME SAFELY!"
330 GOSUB 1000: END
340 CLS: FOR X=1 TO 30+RND(50): SOUND RND(255),1: NEXT X
350 RS="FAILURE! INCORRECT TIME FRAME."
360 GOSUB 1000: GOTO 390
370 CLS: RS="THE LAST WORDS MR. WINKLER HEARD WERE"
380 GOSUB 1000: PRINT: RS=AS(11,2): GOSUB 1000
390 QS="" : M=0: RS="(PRESS ANY KEY TO CONTINUE.)"
400 PRINT@12*WL, "": GOSUB 1000
410 K$=INKEY$: IF K$="" THEN 410
420 GOTO 100
1000 IF LEN(RS)<=WL THEN NS=RS: GOSUB 2000: RETURN
1010 J=WL+1: FOR I=WL+1 TO 1 STEP -1
1020 IF MID$(RS,I,1)=" " THEN J=I: I=1
1030 NEXT I: NS=LEFT$(RS,J-1): GOSUB 2000
1040 RS=RIGHT$(RS,LEN(RS)-J): GOTO 1000
2000 PRINT TAB((WL-LEN(NS))/2); NS;
2010 IF LEN(NS)<WL THEN PRINT
2020 RETURN
4000 DATA ACVEFSBMP
4010 DATA 4,LEFMFUO,UNXMPWWDIB,FLGYZ&ZGRQOTM,QAZEXCV
4020 DATA 2,MSNQRQ,DTMROSXVMTIW,2,UIDBCO,KXTCCZC
4030 DATA 3,IJFN,WYLOBALJ,AJSSJUBUJPO
4040 DATA 2,TILUHAY,MJVAGRETERRA,2,EXBJFY,HUQVB
4050 DATA 3,VNKYG6DQJPEJC,MTNETYVAT,MUNOVG
4060 DATA 2,QWCFRKZEX,AVQ!BOE!EPXO
4070 DATA 2,BDQWPEKPI,PICYBYDW
4080 DATA 2,KDHTDD+NSPPDP,RTJAKLDQ
4090 DATA 2,C4<9<,CX111#VPDOO#VWHS#111X

```

Atari/Brain Terrain

```

10 DIM AS(209), DS(21), BL$(40), CL$(1), ES(1), NS(40), QS(2
1), RS(99), ST$(40), VS(10), Y$(4), N(11), AS(11,4), AL(11,4)
20 WL=40: GW=0: M=0: ES=CHR$(34): CLS=CHR$(125): QS=""
30 BL$=" ": BL$(40)=BL$: BL$(2)=BL$: ST$="*": ST$(40)=ST$:
ST$(2)=ST$
40 OPEN #1,4,0,"K:"
50 POKE 82,0: POKE 752,1: SETCOLOR 2,5,4: PRINT CLS;
60 READ VS: FOR X=1 TO 11: READ T: N(X)=T: FOR Y=1 TO T
70 READ DS: C=ASC(DS)-64
80 AS(X,Y)=LEN(AS)+1: AL(X,Y)=LEN(DS)-2
90 FOR Z=2 TO LEN(DS): N=ASC(DS(Z))-C
100 AS(LEN(AS)+1)=CHR$(N+26*(N<65 AND N+C>64))

```

```

110 NEXT Z: NEXT Y: NEXT X
120 NS="THOUGHT RECORDER, MODEL XIV": GOSUB 2000
130 NS="(PATENT PENDING)": GOSUB 2000
140 PRINT: RS="PRESS A ZONE KEY (A, B, C, E, F, M, P,
S, T, OR V) TO ACCESS MEMORY"
150 IF GW=1 THEN RS(68)=" ", RS(70)=ES: RS(71)="H": RS(7
2)=ES: RS(73)=" FOR HELP,"
160 RS(LEN(RS)+1)=" OR ": RS(LEN(RS)+1)=ES
170 RS(LEN(RS)+1)="G": RS(LEN(RS)+1)=ES
180 RS(LEN(RS)+1)=" TO GUESS.": GOSUB 1000
190 TB=INT((WL-LEN(QS))/2)-1
200 NS=INT(RND(0)*3)+1: IF M=1 THEN NS=INT(RND(0)*TB)+1
210 NS=ST$(1,NS): NS(NS+1)=QS: NS(LEN(NS)+1)=ST$(1,NS)
220 POSITION 0,10: PRINT BL$: POSITION 0,10
230 GOSUB 2000: IF PEEK(764)=255 THEN 200
240 GET #1,K: IF K=ASC("G") THEN 300
250 IF K=ASC("H") AND GW=1 THEN 440
260 FL=0: FOR X=1 TO 10: IF ASC(V$(X))=K THEN FL=X: X=10
270 NEXT X: IF FL=0 THEN 200
280 M=INT(RND(0)*N(FL))+1: F=AS(FL,M)
290 QS=AS(F,F+AL(FL,M)): GOTO 190
300 PRINT CLS: NS="SPACE/TIME MACHINE ACTIVE."
310 GOSUB 2000: FOR X=0 TO 100
320 SOUND 0,RND(0)*100+X,10,10: SOUND 1,30,10,X
330 NEXT X: SOUND 0,0,0,0: SOUND 1,0,0,0
340 PRINT: PRINT: PRINT: PRINT "INPUT YEAR":
350 INPUT Y$: IF Y$<>AS(186,189) THEN GW=1: GOTO 400
360 PRINT CLS: POSITION 15,10: PRINT "WHOOOOSH!"
370 PRINT: PRINT: NS="SUBJECT RETURNED HOME SAFELY!": G
OSUB 2000
380 FOR X=0 TO 210 STEP 0.7: SOUND 0,X,8,10-((X>200)*8)
390 SOUND 1,X,10,4: NEXT X: END
400 PRINT CLS: POSITION 0,10: NS="FAILURE! INCORRECT TI
ME FRAME.": GOSUB 2000
410 Y=7: FOR C=1 TO 3: FOR X=150 TO 80 STEP -1.5
420 Y=-Y: SOUND 0,X+C*20,10,7+Y
430 NEXT X: NEXT C: SOUND 0,0,0,0: GOTO 460
440 PRINT CLS: NS="THE LAST WORDS MR. WINKLER HEARD WE
RE": GOSUB 2000
450 PRINT: NS=AS(190): GOSUB 2000
460 POSITION 0,20: NS="(PRESS ANY KEY TO CONTINUE.)"
470 GOSUB 2000: GET #1,K: QS="" : M=0: PRINT CLS: GOTO 120
1000 IF LEN(RS)<=WL THEN NS=RS: GOSUB 2000: RETURN
1010 J=WL+1: FOR I=WL+1 TO 1 STEP -1
1020 IF RS(I,I)=" " THEN J=I: I=1
1030 NEXT I: NS=RS(1,J-1): GOSUB 2000
1040 RS=RS(J+1,LEN(RS)): GOTO 1000
2000 IF LEN(NS)<WL-1 THEN PRINT BL$(1,(WL-LEN(NS))/2);
2010 PRINT NS: IF LEN(NS)<WL THEN PRINT
2020 RETURN
3000 DATA ACVEFSBMP
3010 DATA 4,LEFMFUO,UNXMPWWDIB,FLGYZ&ZGRQOTM,QAZEXCV
3020 DATA 2,MSNQRQ,DTMROSXVMTIW,2,UIDBCO,KXTCCZC
3030 DATA 3,IJFN,WYLOBALJ,AJSSJUBUJPO
3040 DATA 2,TILUHAY,MJVAGRETERRA,2,EXBJFY,HUQVB
3050 DATA 3,VNKYG6DQJPEJC,MTNETYVAT,MUNOVG
3060 DATA 2,QWCFRKZEX,AVQ!BOE!EPXO
3070 DATA 2,BDQWPEKPI,PICYBYDW
3080 DATA 2,KDHTDD+NSPPDP,RTJAKLDQ
3090 DATA 2,C4<9<,CX111#VPDOO#VWHS#111X

```

TI-99/4A/Brain Terrain

```

10 DIM AS(11,4), N(11)
20 READ WL, GW, M, FA, VS
30 ES=CHR$(34)
40 FOR X=1 TO WL
50 ST$=ST$&"*"
60 NEXT X
70 FOR X=1 TO 11
80 READ N(X)
90 FOR Y=1 TO N(X)
100 READ DS
110 C=ASC(SEG$(DS,1,1))-64
120 FOR Z=2 TO LEN(DS)
130 A=ASC(SEG$(DS,Z,1))-C
140 AS(X,Y)=AS(X,Y)&CHR$(A+26*((A<65)*(A+C>64)))
150 NEXT Z

```

PUZZLE

```

160 NEXT Y
170 NEXT X
180 QS=""
190 CALL CLEAR
200 RS="THOUGHT RECORDER, MODEL XIV (PATENT PENDING)"
210 GOSUB 1000
220 PRINT
230 PRINT "PRESS A ZONE KEY (A, B, C, E, F, M, P, S, T
, OR V) TO ACCESS MEMORY"
240 IF GW<>1 THEN 260
250 RS=RS&"", "&ES&"H"&ES&" FOR HELP,"
260 RS=RS&" OR "&ES&"G"&ES&" TO GUESS."
270 GOSUB 1000
280 GOSUB 3000
290 IF FA=2 THEN 410
300 TB=INT((WL-LEN(QS))/2)
310 FOR J=1 TO 15
320 NS=INT(RND*3)+1
330 IF M<>1 THEN 350
340 NS=INT(RND*TB)+1
350 NS=SEG$(ST$,1,NS)&QS&SEG$(ST$,1,NS)
360 CALL CLEAR
370 PRINT TAB((WL-LEN(NS))/2);NS;
380 NEXT J
390 FA=2
400 GOTO 180
410 CALL KEY(3,R,S)
420 IF S=0 THEN 410
430 KS=CHR$(R)
440 IF KS="G" THEN 560
450 IF (KS="H")*(GW=1) THEN 830
460 FL=0
470 FOR X=1 TO 10
480 IF SEG$(VS,X,1)<>KS THEN 510
490 FL=X
500 X=10
510 NEXT X
520 IF FL=0 THEN 410
530 M=INT(RND*N(FL))+1
540 QS=AS$(FL,M)
550 GOTO 300
560 CALL CLEAR
570 FOR I=200 TO 1200 STEP 20
580 CALL SOUND(1,I,0)
590 NEXT I
600 PRINT "SPACE/TIME MACHINE ACTIVE."
610 GOSUB 3000
620 INPUT "INPUT YEAR: ":YS
630 IF YS=AS$(11,1) THEN 710
640 GW=1
650 CALL CLEAR
660 FOR I=1 TO 90
670 CALL SOUND(1,RND*3500+200,RND*20)
680 NEXT I
690 RS="FAILURE! INCORRECT TIME FRAME."
700 GOTO 880
710 CALL CLEAR
720 FOR I=1 TO 4
730 CALL SOUND(50,262,0,330,0,392,0)
740 CALL SOUND(400,262,0,330,0,392,0)
750 CALL SOUND(500,110,30)
760 NEXT I
770 NS="WHOOOOSH!"
780 GOSUB 2000
790 GOSUB 3000
800 RS="SUBJECT RETURNED HOME SAFELY!"
810 GOSUB 1000
820 END
830 CALL CLEAR
840 RS="THE LAST WORDS MR. WINKLER HEARD WERE"
850 GOSUB 1000
860 PRINT
870 RS=AS$(11,2)
880 QS=""
890 M=0
900 GOSUB 1000
910 GOSUB 3000
920 PRINT "(PRESS ANY KEY TO CONTINUE.)"

```

```

930 CALL KEY(3,R,S)
940 IF S=0 THEN 930 ELSE 190
1000 IF LEN(RS)>WL THEN 1040
1010 NS=RS
1020 GOSUB 2000
1030 RETURN
1040 J=0
1050 FOR I=WL+1 TO 1 STEP -1
1060 IF SEG$(RS,I,1)<>" " THEN 1090
1070 J=I
1080 I=1
1090 NEXT I
1100 NS=SEG$(RS,1,J-1)
1110 GOSUB 2000
1120 RS=SEG$(RS,J+1,LEN(RS)-J+1)
1130 GOTO 1000
2000 PRINT TAB((WL-LEN(NS))/2);NS;
2010 IF LEN(NS)>=WL THEN 2030
2020 PRINT
2030 RETURN
3000 FOR I=1 TO 12
3010 PRINT
3020 NEXT I
3030 RETURN
4000 DATA 28,0,0,1,ACVEFSBMPT
4010 DATA 4,LEFMFUO,UNXMPWWDIB,FLGYZ&ZGRQOTM,GAZEXCV
4020 DATA 2,MSNQRQ,DTMRO$WXVMTIW,2,UIDBCO,KXTCCZC
4030 DATA 3,IJFN,WYLOBALJ,AJSSJUBUJPO
4040 DATA 2,TILUHAY,MJVAGRETERRA,2,EXBJFY,HUQVB
4050 DATA 3,VNKYG6DQJPEJC,MTNETYVAT,MUNOVG
4060 DATA 2,QWCFRKZEX,AVQ!BOE!EXPO
4070 DATA 2,BDQWPEKPI,PICYBYDW
4080 DATA 2,KDHTDD+NSPPDP,RTJAKLDQ
4090 DATA 2,C4<9<,CX111#VPD00#VWHS#111%

```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/Brain Terrain

```

10 FAST
20 RAND
30 DIM AS$(11,4,22)
40 DIM N(11)
50 LET WL=32
60 LET GW=0
70 LET M=0
80 LET QS=""
90 LET ES=CHR$ 11
100 LET BS=CHR$ 0
110 LET SS="*"
120 FOR X=1 TO 5
130 LET BS=BS+BS
140 LET SS=SS+SS
150 NEXT X
160 LET VS="ACVEFSBMPT"
170 LET LS="42232232222"
180 LET TS="A34L4TN,B4036NNUZS,HXSAB>BS3205Y,J32705Y,R
72565,C2VOX$564V2R5,9XSQR3,I51AA7A,R206,Q2FI54FD,50XXO
ZGZOUT,PEHOD64,VSEJPANCNAAJ,WPTB7Q,I516C,F74S0(XA39Y3W
,TA4LAFCHA,4MFGNY,EUD3P8X2V,FA5(Q3T(T4C3,HT6C5U05Y,VOI
EHEJC,HAEOAA>UZWWAW,MYE5FG8L,02A7A,D;$$$;600ZZ:67S3:$
$;,"
190 LET P=1
200 FOR X=1 TO 11
210 FOR Y=1 TO VAL LS(X)
220 LET DS=""
230 LET DS=DS+TS(P)
240 LET P=P+1
250 IF TS(P)<>CHR$ 26 THEN GOTO 230
260 LET P=P+1
270 LET AS$(X,Y)=CHR$ (LEN DS)
280 LET C=CODE DS(1)-27
290 FOR Z=2 TO LEN DS
300 LET N=CODE DS(Z)-C
310 LET AS$(X,Y) (Z)=CHR$ (N+36*((N<28) AND (N+C>27))+2
8*(N<0))
320 NEXT Z
330 NEXT Y
340 NEXT X

```

GAMES										
Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings						
				O	D	PS	GQ	EU	V	
B-1 NUCLEAR BOMBER Avalon Hill Game Co. 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 \$16 (cassette) \$21 (disk) © 1982	Pilot your bomber into Russia to destroy designated targets in exciting strategy game. Lacks interesting graphics, but its short play-length is a plus for younger gamers. For ages 12+. Not an arcade game. —DELSON	Reviewed on Atari Home Computers, 32K (cass.); available on 32K (d.). Also for C 64 (d. & cass.); IBM PC, 64K (d.); TI-99/4A, 16K (cass.); TRS-80 I/III/4, 16K (cass.), 32K (d.); TS 1000, 16K (cass.).	Defective material replaced free.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
BRUCE LEE Datasoft 19808 Nordhoff Place Chatsworth, CA 91311 (818) 701-5161 \$34.95 © 1984	Leap through the air delivering karate chops to eliminate adversaries. Beat the Wizard and take his gold in exciting arcade adventure for ages 10+. —DELSON	Reviewed on Atari Home Computers, 32K (d.); available on 16K (cass.). Planned for Apple II series; C 64; IBM PC/PCjr. Joystick required.	3-month warranty; \$7.50 fee if user-damaged or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★	
ENCHANTER Infocom, Inc. 55 Wheeler St. Cambridge, MA 02138 (617) 492-1031 \$49.95 © 1983	Seek out evil Warlock. Acquire spells, powers, and learn secrets in all-text fantasy-adventure game filled with wizards, magical creatures, and stimulating puzzles. † —DELSON	Reviewed on Apple II series, 32K (d.). Also for Atari Home Computers, 32K (d.); C 64 (d.); IBM PC/PCjr, 48K (d.); TI-99/4A, 32K (d.); TRS-80 I/III/4, 32K (d.).	90-day warranty; \$5 fee thereafter or if user-damaged. TRS and IBM users make backups.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	D	★ ★ ★	
FORT APOCALYPSE Synapse Software 5221 Central Ave. Richmond, CA 94804 (415) 527-7751 \$34.95 © 1983	Steer through underground maze and free prisoners, while heading for Fort Apocalypse itself, in exciting helicopter shoot-'em-up, with long play life and lively action for ages 10+. —DELSON	Reviewed on Atari Home Computers, 32K (disk); available on 32K (cassette). Also for Commodore 64 (disk or cassette). Joystick required.	Defective disks replaced free w/in 90 days; \$5 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
INTERNATIONAL SOCCER Commodore Business Machines, Inc. 1200 Wilson Drive West Chester, PA 19380 (215) 431-9100 \$34.95 © 1984	Compelling simulation recreates thrill, timing, and "feel" of soccer. Play computer's 9 skill levels or take on human opponent in beautifully animated game for ages 10+. —DELSON	Reviewed on Commodore 64 (cartridge). Joystick required.	Defective cartridges replaced free w/in 90 days; \$17.50 thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	
LORDLINGS OF YORE Softlore Corp. 8714 Wellesley Manor San Antonio, TX 78248-2116 (512) 691-2800 \$39.95 © 1983	Hire troops, purchase spells, rule peasants, and collect taxes as you strive to become Lord over up to 3 other opponents in role-playing strategy-adventure game for ages 10+. † —DELSON	Reviewed on Apple II series, 48K (disk). Also for Apple III. Version planned for IBM PC/PCjr, TRS-80 CoCo.	Defective or user-damaged disks replaced free w/in 90 days; \$10 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★	
MIG ALLEY ACE MicroProse Software 10616 Beaver Dam Road Hunt Valley, MD 21030 (301) 667-1151 \$34.95 © 1983	Fly solo, head-to-head, or cooperative missions as a North Korean or U.S. fighter pilot in fast-paced simulation with 4 skill levels and 5 game scenarios. For ages 8+. † —DELSON	Reviewed on Atari Home Computers, 48K (disk); available on 16K (cassette). Joystick required.	30-day warranty; \$10 fee thereafter, if user-damaged, or for backup copy.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	
OIL'S WELL Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 \$29.95 (disk) \$34.95 (cartridge) © 1983	Direct "drill bit" through underground field to tap black gold and eliminate meanies. Addictive game may wear thin once you've mastered play system. Good for ages 8+. —DELSON	Reviewed on Apple II series, 48K (d.). Also for ADAM (cart.); Atari Home Computers, 40K (d. & cart.); C 64 (d. & cart.). Version planned for IBM PC/PCjr. Joystick.	90-day warranty; \$5 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
THE PHAROAH'S CURSE Synapse Software 5221 Central Ave. Richmond, CA 94804 (415) 527-7751 \$34.95 © 1983	Colorful, simple, skill/arcade treasure hunt takes place in underground caverns of the Pharaoh's tomb. Best suited for fans seeking nonstop action, ages 10+. —DELSON	Reviewed on Atari Home Computers, 32K (disk or cassette). Also for Commodore 64 (disk or cassette). Joystick required.	90-day warranty; \$5 fee thereafter or if user-damaged.	★ ★	★ ★	★ ★	★ ★	A	★ ★	
ULTIMA II Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 \$59.95 © 1983	Roam continents and planets, take on monsters, and acquire treasures and experience points, traveling from age to age in role-playing adventure for ages 12+, 8+ with adult help. † —DELSON	Reviewed on Apple II series, 48K (disk). Also for Atari Home Computers, 48K (disk); Commodore 64 (disk); IBM PC/PCjr, 64K (disk).	Defective disks replaced free w/in 90 days; \$5 fee thereafter or if user-damaged.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	

RATINGS KEY O Overall performance; D Documentation; PS Play system; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

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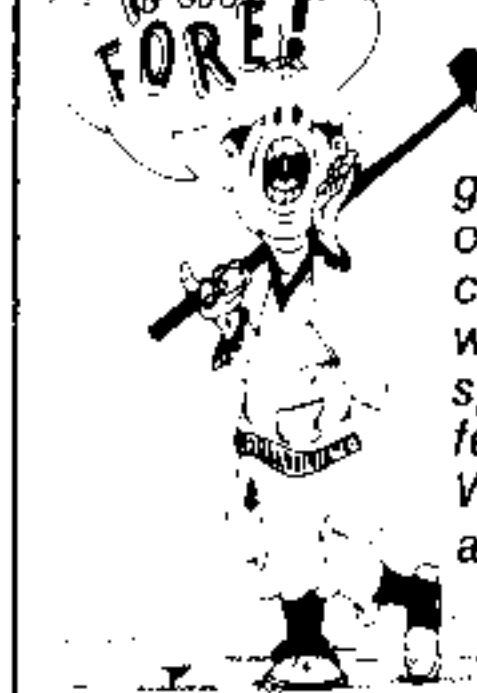
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