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HACKER HEAVEN: PROGRAMS FOR ADAM, APPLE, ATARI, COMMODORE 64 AND VIC-20, IBM, TI, TIMEX, AND TRS-80

TEST RUN: MACINTOSH

SIZZLING SPORTS GAMES

K POWER™

THE MAGAZINE FOR THE COMPUTER GENERATION

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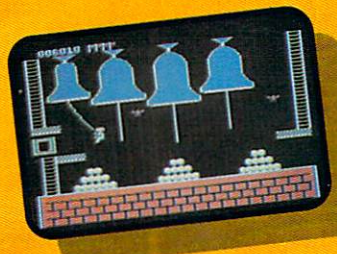

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Quasimodo knows who stole the crown jewels. He even knows where they are, but the soldiers just won't leave him alone! This multi-screen arcade adventure is a great combination of skill and strategy.

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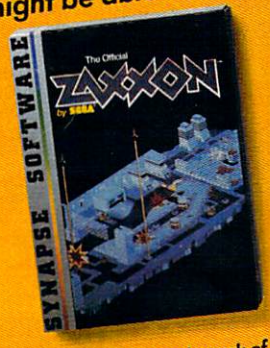

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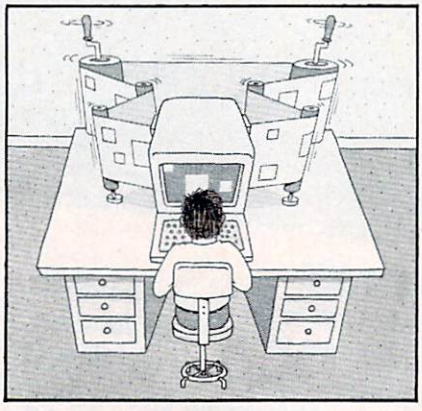

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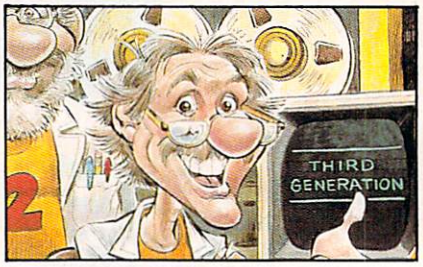

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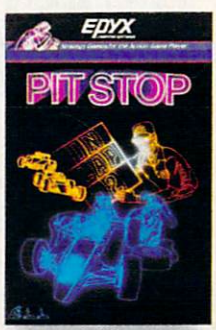

EDITOR'S NOTE

SERIOUS HACKERS! DON'T READ THIS!

You may have noticed this issue of K-POWER is heavy on robots. I thought it was the perfect chance to run a robot program in Hacker Heaven. And I had just the program—the *Kissing Robot*.

Kissing Robot was written by Joey Latimer, who programmed the K-POWER collection—the book of 10 challenging programs and puzzles subscribers get. *Kissing Robot* isn't challenging, but it's fun and I lobbied to print it.

"You can't put that in K-POWER, it's all PRINT statements!" moaned Assistant Editor Michael Tuomey, rolling his eyes. (He reads all the programs that come in from readers.)

"Hackers will laugh at us if they see that program in Hacker Heaven. It's too cute!" Technical Editor John J. chortled. "It's too easy," Michael added. "It's too dumb!" they chorused.

So I gave in. You won't find the too-cute *Kissing Robot* in Hacker Heaven. You'll find it here. If you're interested in watching a square thing pucker up, type on. If not, there's always Hacker Heaven.

Granted, *Kissing Robot* isn't the ultimate in computer animation. For real computer animation, you'll have to turn to p. 27 and read about *Movie Maker*. It's a pretty amazing program that is bound to get you animating.

And, if you're interested in real-life robots, don't miss pp. 20-26. Plus you'll know when your robot's gone too far after reading pp. 30-31. (According to the K-P technical staff, printing *Kissing Robot* was going too far! Well I've done it anyway!)

Anne Krueger

Anne Krueger
Editor

```
REPLACE LINES 10,100 AND 190 WITH
THE COMMAND FOR YOUR COMPUTER
ATARI                "NO CHANGES"
TRS-80,COCO          CLS
COMMODORE, VIC       PRINT CHR$(147)
APPLE II             HOME
TIMEX                CLS
TIMEX  REPLACE LINES 90,180 AND 270
WITH BOTH THESE LINES
                     FOR X=1 TO 10
                     NEXT X

10 PRINT CHR$(125)
20 PRINT "()**********()"
30 PRINT "**            **"
40 PRINT "** (O)   (O) **"
50 PRINT "**            **"
60 PRINT "**      V     **"
70 PRINT "**            **"
80 PRINT "**     ---    **"
90 FOR X=1 TO 50:NEXT X
100 PRINT CHR$(125)
110 PRINT "()**********()"
120 PRINT "**            **"
130 PRINT "** (O)   (-) **"
140 PRINT "**            **"
150 PRINT "**      V     **"
160 PRINT "**            **"
170 PRINT "**      O     **"
180 FOR X=1 TO 50:NEXT X
190 PRINT CHR$(125)
200 PRINT "()**********()"
210 PRINT "**            **"
220 PRINT "** (O)   (O) **"
230 PRINT "**            **"
240 PRINT "**      V     **"
250 PRINT "**            **"
260 PRINT "**      O     **"
270 FOR X=1 TO 50:NEXT X
280 GOTO 10
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LOGON

L E T T E R S

Jolly Joey Ramone

I was very impressed!!! Very excited by the way the article came out (*"Program Along With Joey Ramone," p. 36, March 1984*)—the artwork and especially the computer work. The Atari program was my fave, though all were nicely done. The idea is very unique—a first!

Definitely a special issue. Thanks again!

JOEY RAMONE
New York, NY

Dear Joey,

We couldn't have done it without you! Thanks for letting us computerize "Slug" and for your interest in K-POWER. *Good luck with your new record.*

THE EDITORS

Whiz Kids Complaint

I wasted time doing your *Whiz Kids* program on my Timex Sinclair 1000 and it did not work. My computer kept flashing ERROR CODE 3/850, which means subscript out of range at line 850 and I wasted time doing that stupid program when I could have been doing homework. If you could send me a working program, I would be glad.

NATE TENNEY
Wakeman, OH

Dear Nate,

Sorry you couldn't get the Timex Whiz Kids *program to run. Our technical staff addresses program problems in K-Bloopers (see Hacker Heaven). Any time you have a problem with* K-POWER *programs, let us know. And if you have any good programs, send 'em!* THE EDITORS

BBS Advice

K-POWER's Premiere issue lived up to my expectations of your new publication. Keep up the excellent work.

In Doctor Kursor's Klinic (*p. 18*) the question was answered as to how to start up a bulletin board system. My son Richard, age 12, and I run a Commodore Business Machine-users' bulletin board service in Holland, Michigan. One of the important things that should be mentioned when starting up an area BBS is having a dedicated line, a phone line different than the one Mom and Dad get their calls on. Once a number of a BBS starts getting around, those giving the phone number out forget to also give the BBS hours of operation. This might mean calls at three or four in the morning.

Our BBS number in Holland is (616) 396-7016.

LOUIS C. BIOLETTE III
Holland, MI

In your first issue (*February 1984*), you mentioned bulletin boards (*pp. 18 and 22*) but gave no numbers. For those interested, call on computer: People's Message System, Santee, California; (619) 561-7277. (You'll need a disk to store numbers.) This list includes over 100 phone numbers to call.

CHRIS HEISE
Westerville, OH

Dear Louis and Chris,

Thanks for the info! K-POWER *will publish info about various BBS's and their numbers in our* K-NET *column each month. This month we talk to a big BBS personality, Sourcevoid Dave (see* K-NET). THE EDITORS

ADAM Fan

I have been saving for Coleco's ADAM computer since Oct. 5, 1983. Since then, I've read several magazine reviews on ADAM about all its bad points. I got discouraged. Then, around Jan. 10, 1984, ADAM won several reviews against other popular computers. Then, I saw the February issue of K-POWER. It had a program for ADAM (*p. 48*)! I was so excited it was unbelievable! I hope to see many programs for ADAM in your magazine. Thank you very much! It makes me very happy to know someone is making programs for ADAM!!

TIM CRAVENER
Leechburg, PA

Dear Tim,

Hope you didn't miss the April K-POWER. *Each month we're running a hardware review called Test Run—in April we reviewed ADAM (p. 34)! And,* every *month, you'll find ADAM programs in Hacker Heaven. When you get your ADAM, let us know!*

THE EDITORS

Idea Hunt

Where do you get the articles you use in K-POWER? Do you get them from kids and computer companies?

I liked the article, "Woof Ware" (*p. 38, February 1984*). I thought it was neat. I would like to read an article about how K-POWER was started.

STEPHEN MITCHELL, *12*
Queensville, IN

Dear Stephen,

Thanks for your story suggestion. K-POWER *really wants to find out what our computer-user readers want to read about. In fact, check out this month's contest.* K-POWER *is giving away* K-P *T-shirts to readers who send in good story ideas. Give us a try.*

THE EDITORS

COMPUZINE
VOLUME 1 NUMBER 4

Coming Attractions in Video

The race is on! Major games producers are hard at work, fighting to finish first in the "Video Olympics."

One of the hottest contenders is RDI Video Systems. Rick Dyer, the genius behind *Dragon's Lair*, is president of RDI and has been working with interactive discs since 1978. According to Rick, RDI will be first to come out with a home videodisc game. "The videodisc will operate on voice activation," he says. "There will be no joystick." (Players will talk to the characters through the game.) The Consumer Electronics Show in June is targeted for RDI's first showing of the system.

Meanwhile, everyone's watching Coleco to see when it's going to release the animated version of *Dragon's Lair*. Coleco purchased the rights to the game for a whopping $2 million, and already has released a computer-generated graphics version. The laserdisc version with arcade animation can't be far behind.

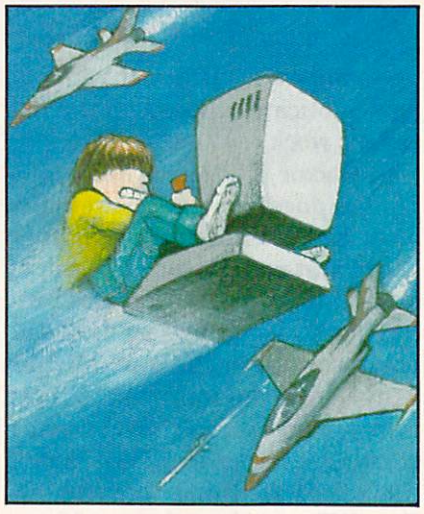

Illustration: Howard B. Lewis

While all this is going on, Nolan Bushnell has some wild ideas about the possibilities for robots in the future. According to Jon Porter, communications manager at Chuck E. Cheese Pizza Time Theaters, Nolan had been talking about a travel booth that will transport people to faraway places before he left the company. A "player" could make a video trip to Venice, with a robot leading the way. As the player maneuvers the robot through the streets and canals of Venice, the sights, sounds, and smells of the city will realistically appear!

Another Bushnell idea is a simulation booth, where the player moves with the action of the game. When you're sitting in a cockpit of a fighter jet, you'll dive when the jet dives. If the jet banks left, so will you. (Hopefully, they'll remember to include air-sickness bags with the game.)

George "*Star Wars*" Lucas also has some wild and crazy ideas for interactive videos—he's even created a games department at his Lucasfilms studio. One of his ideas is to bypass the one-on-one action and go right for the big time. There's talk he may create an interactive video where the audience takes part in deciding the conclusion. Movie viewers would get a chance to vote on the ending by using an instant electronic poll. —PAM HOROWITZ

Silicon ALLEY

Ready for the hottest scoops from the valley?

SINCE LAST MONTH . . . Timex stopped making computers and Commodore's put 264 and 364 on hold.

SECRET STUFF . . . RCA laserdisc players already have computer interfaces in them! (Look in the instruction manual for it—it'll say that the connector is for "future use.") Industry experts are guessing that RCA is waiting to bring out their own computer.

GOING FOR THE GOLD . . . The 1984 U.S. National Video Game Team is being formed. They'll play against champions from Italy, Canada, Japan, and other countries in a sort of Video Olympics. The finals will be held in Florida around October. Competitions may include computer games as well as video and arcade games. This is the first step to professional computer-game players. (No word on when *Dino Eggs* becomes an Olympic event.) **COMPUTERS & THE QUEEN** . . . The Queen Elizabeth 2 that is—it's opened up a computer center. There are six IBM Personal Computers on board, and a full-time instructor. **OGRE DEPT** . . . Andrew Greenberg (famous coauthor of *Wizardry*) is designing a graphic adventure game for Origin Systems. It's called *Ogre*, and it's based on the board game, Ogre. Look for it in July.

The QE2's computer lab.

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Now you don't have to wait years and years to become a tycoon.

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If you play it smart, you'll make enough to expand the railroad into new territories. If you don't? Well, you'll understand how a business can go bankrupt! Either way, you're going to find that working on this railroad is a challenge—and a lot of fun!

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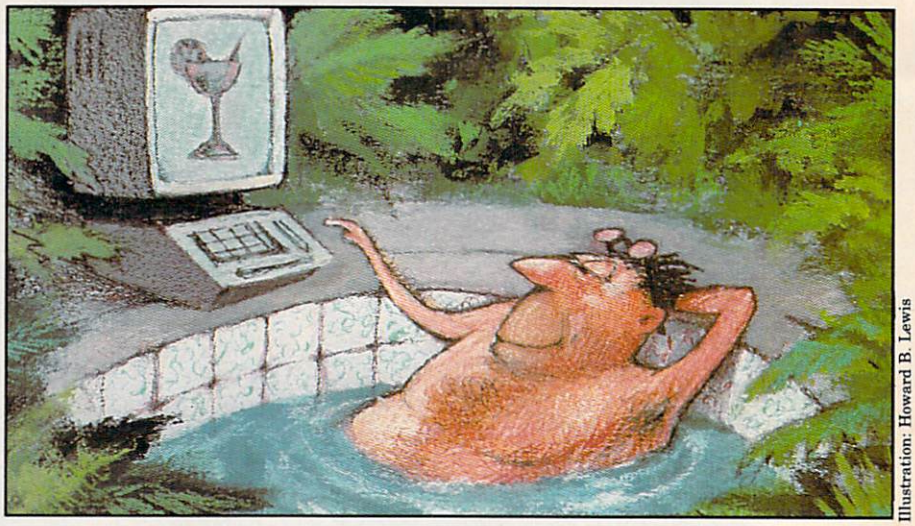


Illustration: Howard B. Lewis

There's no part of Steve Lincoln's New York home that isn't microprocessed, gadgetized, or computerized. Even the refrigerator has a digital readout: A quick glance gives the temperature in three compartments, indicates a recent power failure, and tells you if there's lint on the condenser! "However, it only tells when it's time to clean," says Steve sadly, "it doesn't do the job for you."

When you press the doorbell, it begins to play "The Star Spangled Banner." Steve then can pick up the phone and talk to his guests before they come in. His house also is wired with closed-circuit TV cameras that watch the area behind his house, his daughter's room, and the front door. When the computer monitor isn't being used as the screen for his closed-circuit system, he watches a selection from his videotape collection on it.

Without the computer, it would be impossible for Steve to keep track of his 800 videotapes. He uses a data-base system, so he can search through his filing system, read a capsule description of a videotape, and see where it is. A quick search through the system showed that most of Steve's X-rated tapes were on loan . . . to his father!

In addition to Videoland, Steve also has his own private Stereo World. He can choose his sound from any one of 20 stereos—all push-button-controlled from every room.

When he has a problem, Steve Lincoln invents a solution. His current dilemma is how to tell time in the hot tub. His glasses fog up in the steam room, and he can't see the clock. And since he listens to the stereo full blast, he can't hear his talking clock. So he's working on a system that will lower the volume of the stereo at the touch of a button—and then announce the correct time!

Steve earns a living selling his high-tech toys. He owns and operates his own business on Long Island, called "Electrasonics," where he does a lot of work for the rich and famous. "When they come over to talk," says Steve, "they almost always stay to play."

Photo: Andy Levin/Blackstar

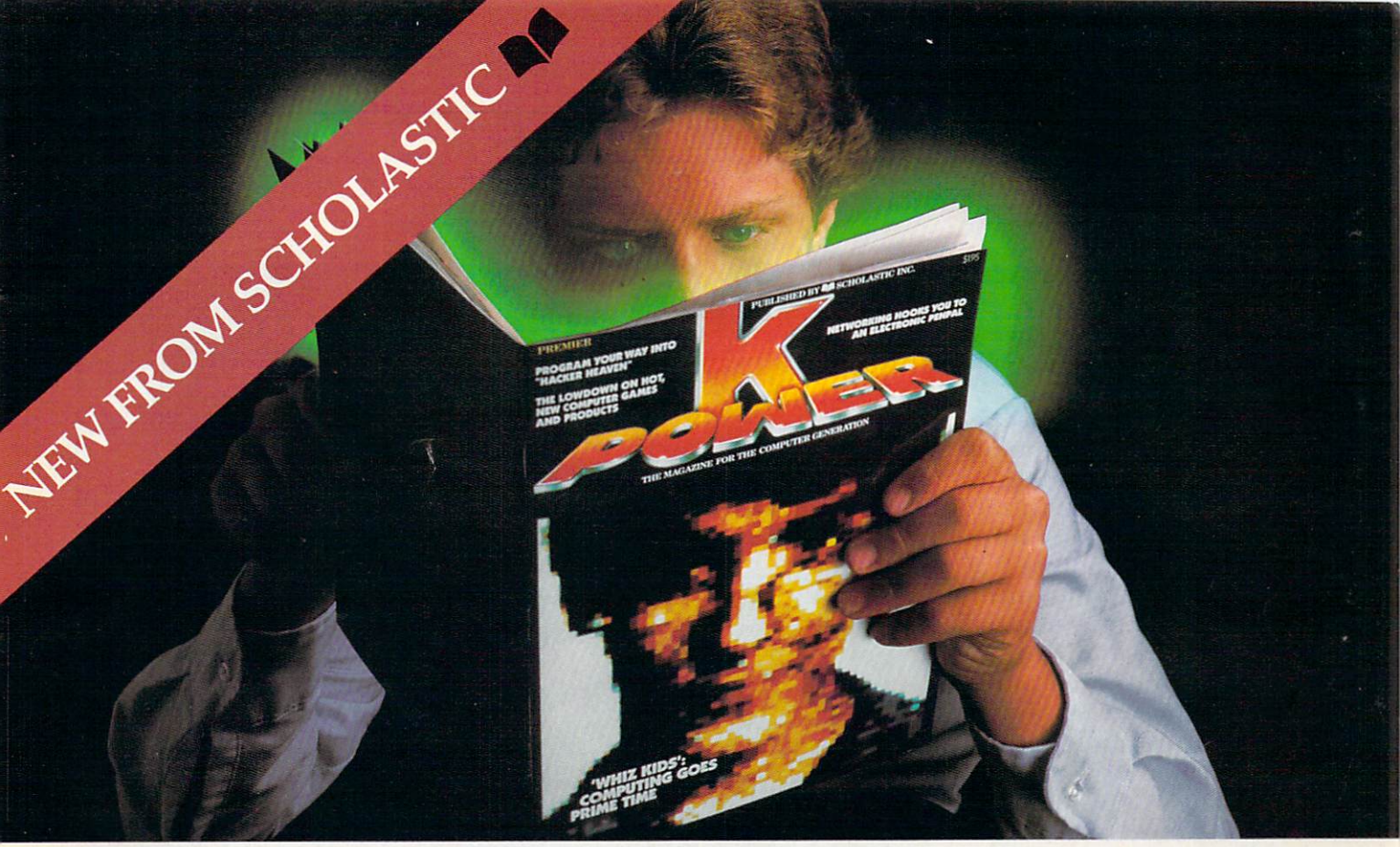
To improve athletes' performances, they're charted by a computer.

Olympic Computers

A computer winning a gold medal? Ridiculous, right? Not really. When our Olympic athletes take home the gold this summer, a lot of them will be using computers to help do it. The U.S. Olympic Center in Colorado Springs uses $500,000 worth of computer equipment to analyze athletes' performances.

Trainers film athletes' performances with special high-speed film and, when the film is projected, they chart joint placement on a special computerized graph. The computer reads this graph and helps athletes improve their technique. In fact, Olympic discus champion Mac Wilkens has a computer to thank for his world record. It helped him pinpoint and correct a trouble spot: He used too much speed in one sequence of his spin.

Athletes also use computerized weight machines. The machine is fed a digitized profile of a super athlete, which acts as a training model. Then the computerized weight machine can be set to push an individual athlete to achieve those higher levels.



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The Spy Game

Everybody's favorite arcade game a few years ago was *TRON*, remember? But have you heard that *TRON* was a secret weapon?

The government attached security regulations to the arcade version of the *TRON* video game. K-POWER heard that the microchips inside *TRON* are more advanced than those that can be produced by Russian semiconductor companies. So the U.S. banned export of the *TRON* game to Eastern Bloc countries.

The next time you're blasting those multiplying spiders, think about it. The guy behind you, waiting for his turn to play, just might be a KGB agent, trying to steal the game to bring back to Russia.

Illustration: Howard B. Lewis

SCROLLING IN DOUGH

She Works Hard for Her Money

By Lupine Seran

Working at my parents' computer store isn't ever going to make me rich. But it will put me on the right track. At age 13, I'm building my own bank account and learning a lot about computers. I also have two computers in my home.

I'm probably lucky that my parents own Academy Computers, a computer store in Colorado Springs, Colorado. But it's real tough juggling homework, term papers, tests, *and* a part-time job. Hardly any other eighth grader knows what it's like to work for money.

Lupine helps out at Academy Computers.

I've learned a lot about the computers at the store. And every time I look around, a new computer has popped up, and new faces are walking into the store. Business and computers have become a major part of my life. I give product demonstrations, talk with customers, and share my computer know-how.

It's only a minimum-wage job, yet it suits me fine. I plan to stick around there until college, but I don't think I'd ever want to take over the business. I'm counting on a career in computers, and this is a great experience. As I get older, I'll work more at the store—like my brother, Nick. By then I'll be able to handle my schoolwork better. And I know I'll need more money then!

LUPINE SERAN, *13, lives in Colorado Springs, Colorado. She doesn't plan to be a computer retailer—but micros are somewhere in her future.*

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Quick reflexes and sharp eyes are not nearly enough here. As you race around the country on super-fast rocket trains, you'll need all your smarts to outwit the devious plague spreader. But watch out! One wrong move and you're just another fuzzbody.

And once you've tested your mettle against the FuzzBomb, you'll be ready for more mind-stretching Wizware.™

Bannercatch.™

In a remote field bigger than any field you can imagine, you and a friend team up to take on chief robot Max and his crack robot raiders. Infiltrate their territory and grab their flag before they grab yours. It may sound simple, but your strategy better be good. Max has lots of surprises in store for you.

Spelldiver.™

You're a scuba diver on a secret assignment. You must find and decipher giant words hidden deep beneath the sea. But to succeed you have to outmaneuver ferocious sharks and pesky flipper-nippers that are out to stop you.

So get ready for challenge and excitement. Boot up Wizware and let the brainstorm begin.

Look for Scholastic Wizware at your local computer store. Or contact Scholastic Inc., 730 Broadway, New York, NY 10003, 212-505-3000.

For a free red-and-white "Boot Up a Brainstorm" T-shirt, send your name, address, shirt size and computer brand to "Boot Up" c/o Scholastic at the above address. Enclose $2.00 for shipping and handling.

Scholastic™ Wizware

Agent U.S.A., Bannercatch, Spelldiver designed and developed by Tom Snyder Productions, Inc. Available for Atari and Commodore 64 computers. Apple and IBM versions available soon.

Computer Trivia

Here are a few facts we got out of *The Naked Computer,* a book written by Jack B. Rochester and John Ganz, and published by William Morrow & Co.

DEBUGGING THE SYSTEM—Once upon a time, someone discovered that a dead moth was the cause of problems in a Harvard computer system. When the moth was removed, so were the problems—hence the term "debugging the system."

CALLING ALL COWS—Microchips have replaced branding irons on several ranches, thanks to a company called Identronix. A small chip, so powerful that its signal can be picked up through two inches of concrete, is planted under the cow's hide.

Game-Design Contest !!

Got a game program that'll fry our eyeballs? Send it in and win an Apple IIe with 64K, tilt-screen green phosphorous monitor, disk drive with controller, 80-column card, and a pair of game controllers. Or a modem . . . or $100 worth of software . . . plus $100 if we publish your program!

apple computer

It's all part of K-POWER's Annual Game-Design Contest going on NOW! All entries must reach us by August 31, 1984. If you want your printout or listing returned, enclose a self-addressed stamped envelope. Void where prohibited.

GOT SOME JUICY NEWS?

Do you have a juicy computer scoop? K-POWER wants to hear about it. We'll pay $25 for each item we publish. Write to: Compuzine, c/o K-POWER, 730 Broadway, New York, NY 10003.

Xanadu

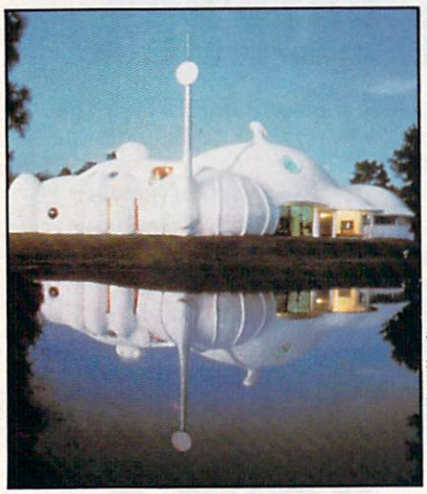

Photo: Grady Allred

A sunny view of Xanadu in Florida.

"Wake up, Noel. Your father is planning to have breakfast with you in 45 minutes and you know he doesn't like you to be late for your lesson. Now get up!"

Who's nagging Noel? The House Brain! Noel lives in Xanadu, a model home of the future run by a centralized computer brain. No one really lives in Xanadu (located in Kissimmee, Florida), but creator Robert Masters thinks people will be living in homes *like* Xanadu within the next 20 years.

In the family room, there is a wall-sized TV screen connected to a variety of interactive two-way cable systems. A portion of the House Brain scans TV and radio programs, automatically recording and filing the family favorites. Another wall is an electronic art gallery of selected computer-generated art.

In the kitchen, computerized appliances monitor temperatures and time. The House Brain acts as a dietician, culinary advisor, pantry keeper, and social secretary. It even connects to retail outlets for teleshopping.

The dining room has a 180-degree curved window. A robutler can serve food it has picked from the climate-controlled greenhouse. It also prepares meals on command.

The Great Room is used for entertaining. The House Brain can make adjustments in sound and light, according to the number of people present and the type of party.

The House Brain can be fully controlled from the headboard of the bed in the Master Bedroom. Besides that, a friendly voice tells the masters of the house the time, their appointments, the weather, and when breakfast is ready. One of the neatest features of this room is the clothes closet that files and retrieves every article of clothing on command. It even cleans clothes periodically by sonic vibrations.

Now snap back to 1984. A home anything like Xanadu is only available now to those willing to pay the price. But by the year 2001, who knows? Xanadu may just look like all the rest of the houses on the block!

—BERNADETTE GREY

DOCTOR KURSOR'S KLINIC

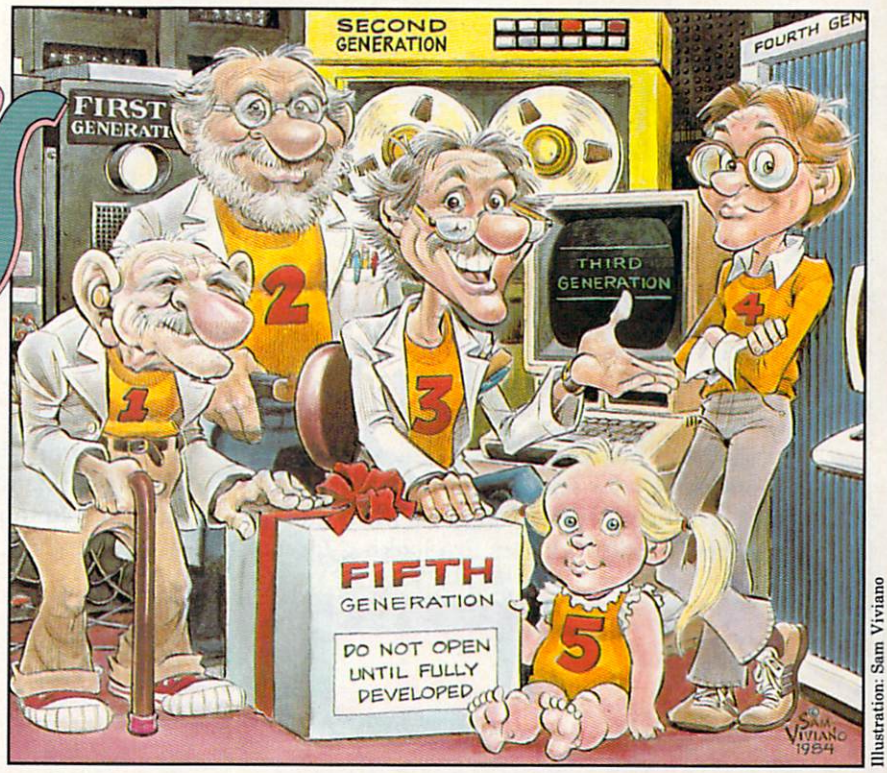

Illustration: Sam Viviano

Explain the "Fifth Generation" of computers.

DR. KURSOR: As technology evolved and computers became more sophisticated, each level of progress was labeled a "generation." So far we've gone from (1) the granddaddy vacuum-tube computers, to (2) the generation of transistorized computers, to (3) integrated-circuit computers, to (4) VLSI (Very Large Scale Integration) computers. The fifth generation, the baby of the bunch, is right around the corner. It isn't fully developed, but promises to be more advanced than all the rest. (Your computer probably falls into the third generation.)

Japan already is working on fifth-generation computers. They're envisioned as being *so* different from today's computers that they've got a new name—Knowledge Information Processors (KIPs). I've heard they're based on reason rather than calculation, that some of the computers will understand the written and spoken word, and that they'll be able to examine data and make inferences.

How does a hard disk work?

DR. KURSOR: Do you think your floppy disk drive is slow? Are you always running out of disk space, or switching different disks in and out? If you've got more than $1,000 to spend, a hard disk drive is the answer!

A hard disk drive (you'll also hear people calling them Winchester drives) is similar to a regular floppy disk drive, except the disk is rigid, not flexible ("hard," not "floppy"), and usually is mounted permanently inside the drive.

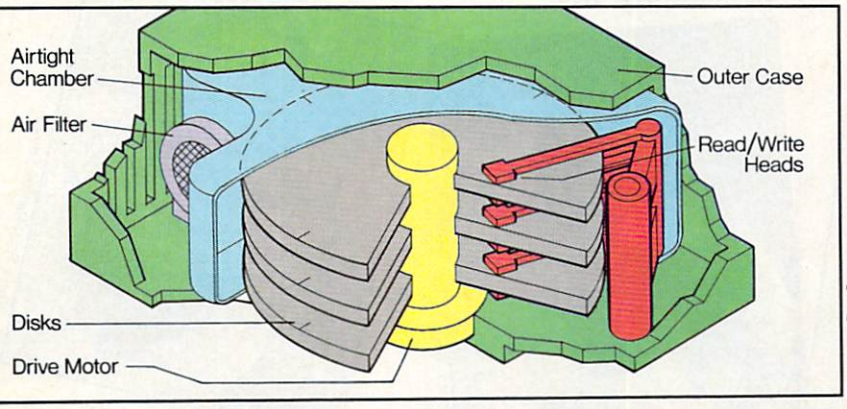

Diagram: Pat Lyons

What? You can't change disks? That's right. When you fill up a hard disk, that's it. But there are compensations. Instead of 200K or 300K, a hard disk can store five, 10, or even up to 60 megabytes. That's 60 *million* bytes, as much as 200 or 300 floppies could hold.

Besides, it's *fast*. A typical floppy drive can send data to your computer at 250,000 to 500,000 bits per second; a Winchester can do it at 10 times that rate. How's that possible?

Since the same disk is always in the drive, it's sealed with the read/write head in an airtight container to keep dust and other impurities out. This means the head can come very close to the disk . . . and the disk can turn faster (around 3,600 rpm compared to 300 for a floppy!).

And there's a new breakthrough: Now they're starting to make rigid disks in removable cartridges! You can get up to about six megabytes on a single $35 cartridge, and the special drives should be available for less than $800.

K-NET™

Plug in to K-NET each month for what's new with K-POWER's national network. Plus, find out what's hot in the telecommunications arena!

What will homes be like in the year 2001? No one knows for sure. Some say the next 20 years will bring little change to homes as we know them today. Others are looking forward to wild, computerized homes—like Xanadu, the futuristic model house in Florida. (See story in Compuzine.) K-NET has its own ideas on the subject.

How computerized will homes be in the year 2001?

(ERIC S.)The year 2001 will probably be pretty close to the same. There are so many electronic devices in homes NOW. Computers might be used to keep a check on appliances. And they'll be cheaper and more available. Some people will have robots but not everyone. But kids will still be going to school and adults to work. Things will be the same as now.

(TOM S.) Probably everybody is going to have a computer. But it's hard to tell how computerized the future homes will be. There will be some robots but not in every home. And they won't be able to do as much as humans. Computers might be used to do things like regulate oven and refrigerator temperatures, but otherwise they really won't be used in the kitchen.

(JILL) There will be a lot of computerized items in the kitchen, like a computerized dishwasher. Appliances will be easier to work. You'll just have to touch a button. I don't think robots will be like servants yet. There's going to be more robots like Topo--but not the kind you see in science-fiction magazines. But many more people will have computers because they won't want their kids to be deprived.

Jill Bassett, 12
Miami, FL

Photo: Jonathon Utz/Picture Group

Eric Saberhagen, 13
Tom Saberhagen, 12
Albuquerque, NM

Photo: Tony O'Brien/Picture Group

Eric Fisch, 14
St. Paul, MN

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5KP4

(ERIC F.) Houses in the year 2001 are going to be very much computerized. Everyone will have to be familiar with computers to keep their house working well. But I don't think robots will be that popular yet. I'll be able to do things like turn the oven on at certain times even though I'm not there. When I come home, my food will be ready. There will be more people working at home through their modems. Things will be much more convenient.

(DAN) There'll be computer terminals in each room and they'll be hooked up together. Robots will be doing jobs and you'll control them from anywhere in the house with an infrared remote-control keypad. Before you enter a room, you could turn on the lights. And there might be a robot chef in the kitchen or a robot watchdog. As we get more into artificial intelligence, robots will be able to do what humans can do.

(STEVE) There'll be a lot of computerized shopping and maybe computerized schooling. I imagine that a lot of people will be working at home and sending stuff through the modem. There will be robots that are trained to clean house, prepare meals, and watch the house. Computers are going a long way. And they'll go further. They'll be as common in the house as a TV set. When you buy a new house, a computer will be built right in.

(DARA) My home will have different gadgets everywhere and there will be robots instead of people doing the chores. When the dishes have to be done, they will get done by themselves. And my TV will automatically shut off when I'm not watching it. When I want to cook food in my oven, I'll type in a command and what I want will be in there later on. There will also be a lot of underground houses in the future.

(JODI) Appliances in the kitchen, like refrigerators, will automatically open and it will be easier to cook with new computerized tools. It will probably take longer than that before robots start appearing in many homes. Kids will be using computers more at home to do their homework. In 20 years from now, just about everyone will be able to have computers in their home.

(SCOTT) I think whole houses will probably be controlled by a computer. We'll be able to put in a special code for a certain record to play, or light to go on. The computer will even be able to do things like turn on a dusting machine. Most people will have computers in their home. At least, I hope they will!

(TOM P.) We've already seen a drastic change in just 10 years. So many things in electronics are turning to computers. TV and radio are examples of electronics turning towards computers. There are going to be a lot of advancements by then. A crude example is walking into the kitchen

Dara Cook, 9
Tuckahoe, NY

Steve Horowitz, 16
Dan Horowitz, 14
Westport, CT

Jodi Moskowitz, 12
Scott Moskowitz, 9
Toledo, OH

Tom Peterson, 14
Vancouver, WA

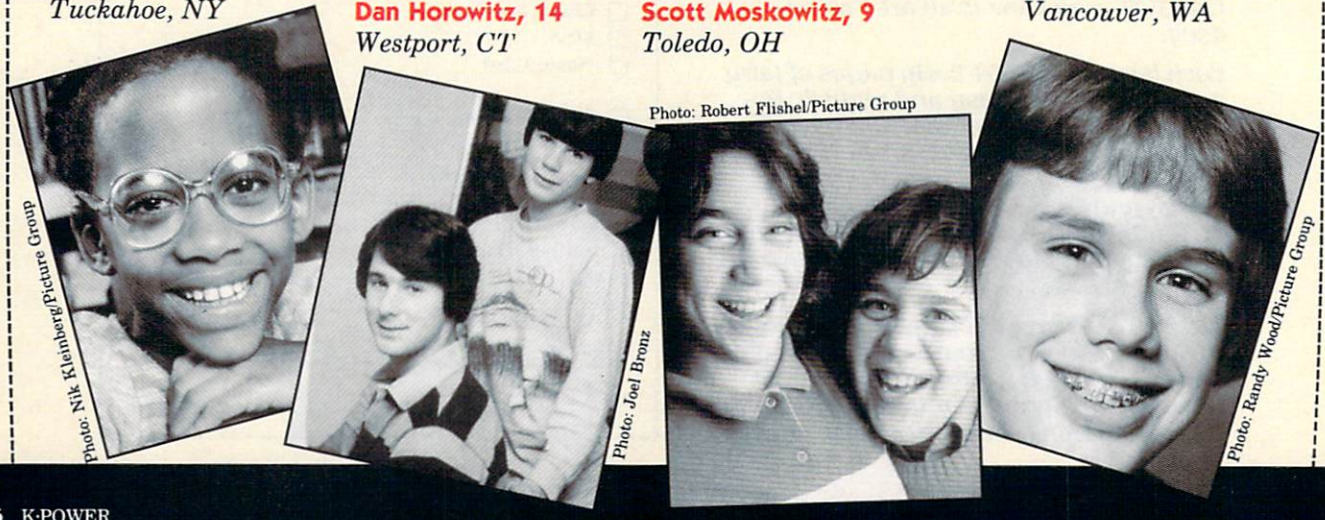

Photo: Nik Kleinberg/Picture Group

Photo: Joel Bronz

Photo: Robert Flishel/Picture Group

Photo: Randy Wood/Picture Group

and punching a button for your breakfast. The price of computers will go down and robotics will be a nice new addition to a computer system. Many appliances will still remain the same--but easier to use. And, depending on your style of work, you may be able to use your computer to work out of your home.

WILL YOU BE THE NEXT K-NET KID?

K-POWER is almost finished choosing the rest of the K-NET. We received lots and lots of letters from computing kids who want to hook up with the network. And we read 'em all!! The winners will be announced in our July issue. Watch for it!!

Electronic Travels with Sourcevoid Dave

David Hughes has thousands of friends all over the country who don't know what he looks like. Many don't even know his real name. David, better known as "Sourcevoid Dave," is the popular sysop (systems operator) for "The Old Colorado City Electronic Cottage," an open bulletin board in Colorado Springs, Colorado ([303] 632-3391). The retired military officer has received 17,000 electronic messages and has spent $10,000 on network conversation in less than a year. He spoke recently with K-POWER.

K-POWER: Why have you put so much money into your bulletin board?

SOURCEVOID DAVE: The $10,000 I've spent is cheaper than what it would cost to buy a car, and a car can't take you around the world!

KP: How does your board work?

SD: Logging on to "The Old Colorado City Electronic Cottage" is like entering a Colorado ghost town. My menu has an information bank called the "Poker Table," an "Opera House" for downloading and uploading software, and a post office system, called "Pony Express," for exchanging messages. Visitors can talk politics at "Roger's Bar" and say anything about everything in the "Town Hall."

KP: What can networking do for kids?

SD: Kids and adults can communicate on a network without getting hung up on age. When you communicate on-line, no one asks how old you are. Kids can say whatever they want and know they won't be put down. They can talk easily to strangers—something they'd never do if they had to speak into a telephone.

KP: Do you know why more males than females are into computing?

SD: A lot of girls aren't interested in programming, and no one bothers to tell them that you don't have to write programs to use a computer. Kids should be telecommunicating and word processing in school.

KP: Did you ever have any pirates on your board?

SD: A kid named Eric from another state called and asked if he could set up his own bulletin board on my board. I said yes. Shortly after that, the F.B.I. called my board looking for pirates. Later, I read a wire service report that said the F.B.I. had raided Eric's house and confiscated his computer.

KP: How did you get the name "Sourcevoid Dave"?

SD: I believe that networks are a way for people to touch souls electronically. In 1980, I began to wonder if anyone else felt the same way. So I left a message on The Source asking: DOES ANYONE OUT THERE (IF ANYONE IS OUT THERE) SHARE MY FEELINGS, OR ARE WE VIBRATING IN A VAST ELECTRONIC VOID? Over 600 messages told me that I wasn't alone, and from then on, I became known as "Sourcevoid Dave."

KP: Most boards say that you must use your real name when you log-on. Do you do this on your board?

SD: I don't care about names. I only care about what you are—not who you are—and what you have to say.

KP: Tell us about an on-line romance.

SD: A woman named Ann Blocker and I wrote electronic poems to each other on The Source. Ann says that she fell in love with me a half hour after she accessed my files.

KP: How important is it to get involved in telecommunication?

SD: As people trade in their pencils and turn to electronic networks, they'll be doing more communicating with others than ever before. Telecommunication is the way of the future, and kids have to learn how to use it *now*.

—PAM HOROWITZ

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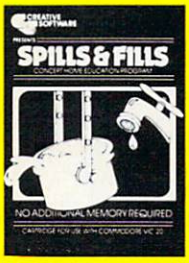

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The "Riptide" crew: Two hunks, a hacker, and a robot.

RIPTIDE™

A hacker and a robot star in NBC's latest detective hit—brought to you by the folks who created the "A-Team!"

Interview by Jane King

MTV has robot videos. The rock band Styx sings "Mr. Roboto." And now "Riptide," NBC's latest detective hit (Tuesdays at 9 p.m. EST), stars—you guessed it!—a robot. Its name is "Roboz" and it's a "squat, ugly, orange *thing*," according to the show's resident hacker, Murray "Boz" Bozinsky. Boz is "Riptide" 's robotics expert. He looks after Roboz and occasionally uses a computer to do a little unauthorized intruding. Boz and Roboz also supply a lot of comic relief for the show. (Like many technological innovations, Roboz doesn't always work right.)

While Boz and Roboz take care of the brainwork, detective buddies Nick Ryder and Cody Allen (played by Joe Penny and Perry King) run around chasing crooks, flying the Screaming Mimi (their helicopter), and zipping around in *Riptide* (their cabin cruiser).

K-POWER talked with actor Thom Bray, who plays Boz, and asked him his views on robots (since he's the only actor on TV who works with one).

K-POWER: In the show, how did Boz get hooked up with the *Riptide* crew?

THOM BRAY: Murray Bozinsky knows the other two guys from 'Nam [Vietnam]. After he gets back to the States, Boz becomes a computer expert. He becomes very famous, makes $20 million, and loses it all in the stock market.

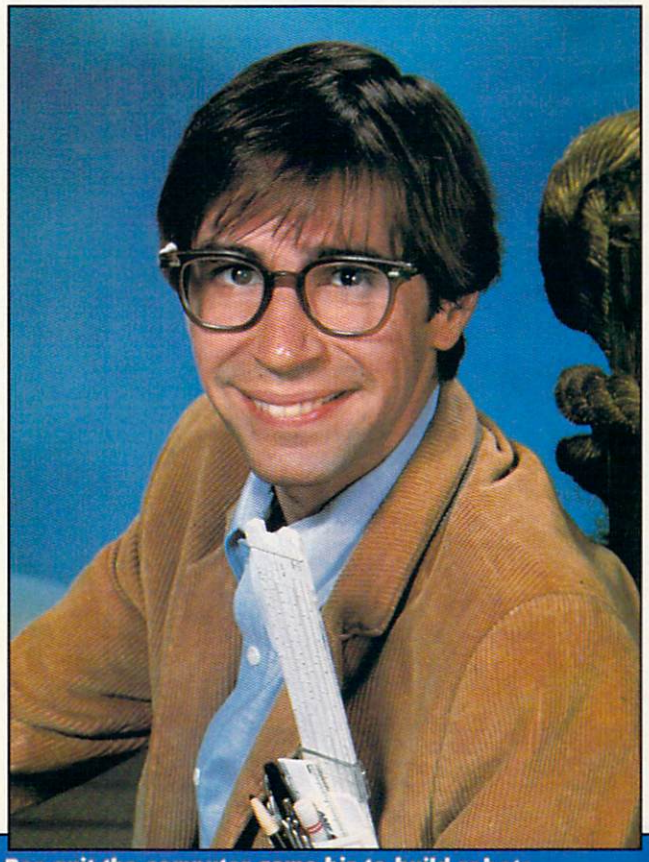
Murray programs computer games for a company like Atari, only it's called Dynogame. And he gets really smoked because he doesn't like what they're doing to his games—they're changing them. So Murray gets furious and clobbers his boss. They try to have him arrested. At that point, he's rescued by the boys. They take him away, and he joins their detective agency as a partner.

K-P: How does Boz go from computer games to robots?

THOM: Somewhere in between all that, my feeling about Boz is that the computer games were a way of making his bread and butter. But what he's really interested in is robotics. And he's designed this prototype robot called "Roboz."

When I first saw Roboz, I thought he looked a little like Heckle and Jeckle. At first we—"we" meaning Stephen [Cannell] and the writers and all of us—thought, "Well, maybe we should high-tech him up a little, sand him down and paint him silver." But after a while he kind of grows on you. I kind of like the idea that he's ugly! He's a little, squat, ugly, orange *thing*.

Murray doesn't care about appearances. He doesn't care how he dresses, what he looks like. So why would he care what color the robot was? The reason the robot is orange is probably because he had some orange paint lying around. Or he got a good deal on it. I like that. It looks like a homemade robot, which is what it is.



Boz quit the computer game biz to build robots.

Boz is constantly improving it and tinkering with it, and expanding its capabilities. For example, on the first show, Roboz was operated by a hand control. Then we established that he could respond to voice-activated commands. So as the weeks go on, we decide what the old guy's capabilities are.

K-P: Like what?
THOM: I'd like to see the Roboz have voice capabilities. I have this wonderful notion that Murray will be tinkering around with it and try out different voices with it. Like the voice of somebody's mother-in-law, this irritating, grating, "Boys, don't put your feet on the furniture!" And eventually, some sexy, lady's voice.

I'm learning a lot from Murray because of all his computer knowledge and the way he thinks—and I just recently bought a computer.

My brother-in-law is a software engineer at Atari. He does what Murray used to do—he makes video games. He's one of the elite in the computer world who sit around and make games. My experience with him and his peers and co-workers has given me a lot to draw on, not only for Murray, but for my interest in computers.

Now, I have a troubleshooter at the other end of the telephone. Whenever I have a question, I just call my brother-in-law. "Plug it in, Thom," he says.

K-P: How good are you with the computer? Can you program?
THOM: If making the hair on my head grow was what I could do with this computer, I'd have about two hairs. I haven't begun to dent the possibilities of this thing, and I'm having a ball with it.

Because I was in awe of computers, I wouldn't have had the courage to start to learn. Until Murray came along and showed me that anything was possible.

K-P: Would you want a robot in your house?
THOM: I wouldn't mind it. I don't know how Barney, my dog, would feel, though. He might bark at it and jump at it.

K-P: What would the robot be used for?
THOM: I envision the house of my future fully computerized. And the central computer talks to the robots that are functionally designed for cleanup, and things like that. Then I could come home and say, "Computer, where's Barney?" And the computer will say, "That character's in the bedroom chewing up your $200 shoes." And if he did chew the shoes, I'd have a robot that'd come out with a broom and bop him on the head.

K-P: Would you like a robot as a friend or companion? Or does the idea horrify you?
THOM: Sure I'd like an android as a friend. I'd go for that.

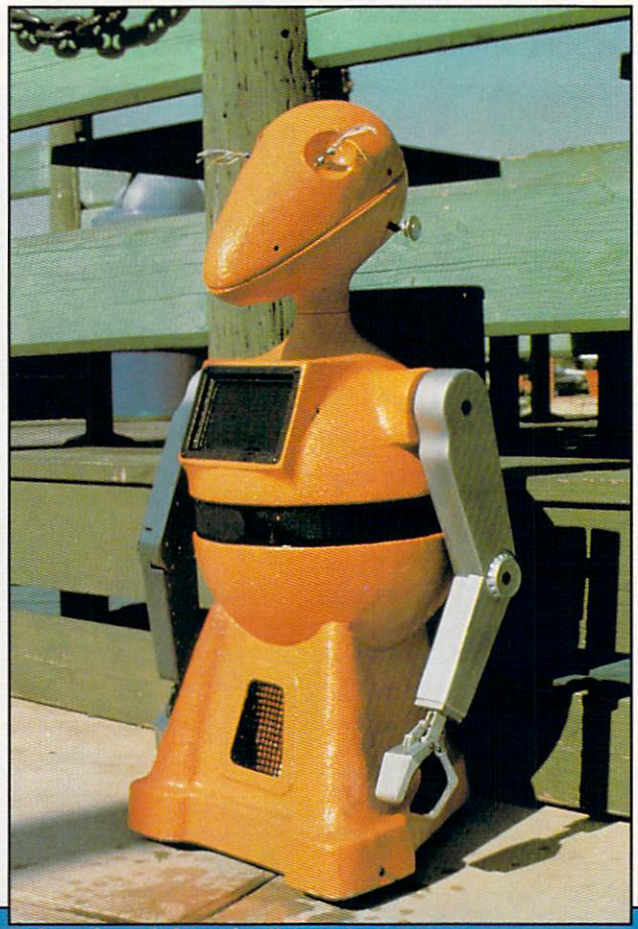
K-P: You sound like you'd like to buy one!
THOM: I could see myself having one in a couple of years. Especially as they get more sophisticated. I couldn't justify buying one yet. Soon, it'll vacuum your floors, too. So you'll figure, "OK, it's a vacuum cleaner." Then you won't feel so bad about spending $2,000 on a vacuum cleaner, because it also makes your eggs and all that other stuff.

K-P: So when they picked you for Murray Bozinsky, they were picking the right guy. Did you discuss this kind of stuff with them?
THOM: No. You never discuss this stuff.

I definitely identify with Murray's fantasies. The property man and I decided that Murray loves the space shuttle and loves models, so we've dressed the set with models of the space shuttle and of the *Enterprise* . . . they're just lying around. Whenever we can slip in jokes about the *Enterprise* and Captain Kirk, we do. Because Murray would be a "Star Trek" nut, like me. I hope they do six more pictures, so that I can be in one of them. The absolute be-all is to be in a "Star Trek" picture. I'll take *Star Wars*, too. I'd like to play a creature from another world.

K-P: Is there anything you wouldn't want a robot to do?
THOM: Play Murray Bozinsky. **k**

Since talking with Thom Bray, JANE KING *has become a big fan of "Riptide," and never misses an episode.*



Roboz doesn't have it all together—yet.

WILL ROBOTS TAKE OVER THE WORLD?

INTERVIEWS BY CHRISTINA KELLY AND JANE KING

What role will robots really have in our future? To find out, K-POWER approached some conventional and not-so-conventional experts. We talked to a robot maker, a police bomb squad that uses robots, the owner of a robot store, a comic-book artist, a science-fiction writer, and game designer Eugene "*Robotron*" Jarvis. Would they like a robot for a friend? Could robots be dangerous? Their insights into this hot new technology are fascinating, funny, and sometimes frightening.

"ROBOTRON" JARVIS

Eugene Jarvis is a video-game designer, best known for *Defender*, *Stargate*, *ROBOTRON: 2084*, and his newest game, *Blaster*. *ROBOTRON* is based on his theory that in 100 years robots will decide mankind is inefficient and should be destroyed. The player controls a genetically mutated superman, who saves the last human family.

About robots in the future, Jarvis says, "A robot could do your work for you and become your alter ego. If you were a kid, it would take your final exams for you. You'd let it do all the nasty jobs so you could sit in your hot tub and think big pictures."

Jarvis would like to have a robot dog. "You wouldn't have to worry about him biting the mailman or the paperboy."

Although he considers state-of-the-art computers to be in a primitive stage of development, Jarvis believes they are improving rapidly. "Human evolution is a very slow process compared to the development of computers. If this continues, we'll become an inferior life form. We'll sort of be like the monkeys in the zoo, and the robots will stare at us and say, 'Can you believe that we evolved from these stupid creatures?' "

For efficiency's sake, the people of the future might install a robot government. At that point, says Jarvis, the robots might decide to overthrow the humans. Even if they didn't, the discovery that humans were not the most intelligent entity would result in a psychological crisis, "just like when we discovered that the earth wasn't the center of the universe."

"... [a robot] could take your final exams for you."

Eugene Jarvis truly believes that robots will take over.

Photo: Martha Leonard/Picture Group

Jarvis believes his prophecy is inevitable—"unless we destroy science and go into a new dark age of technology and burn our pocket calculators."

SCI-FI SLADEK

John Sladek is a science-fiction author whose novels are about robots. Some of his better known titles are *Tik-Tok*, *Roderick*, *Roderick at Random*, and *Mechasm*.

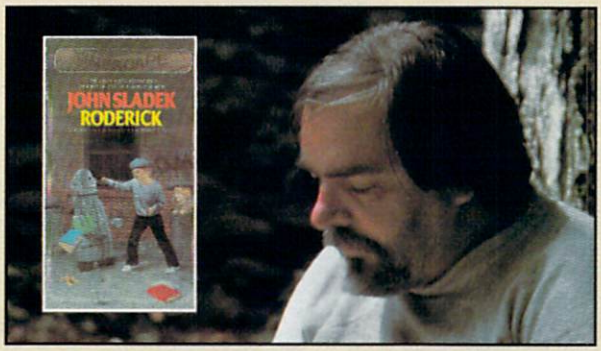
"I think there's always been an urge in people to build artificial humans. Practically every civilization that's been recorded in history has made some kind of dolls or puppets or marionettes. *Pinocchio* is a kind of a robot story—the idea of building something and it comes to life," Sladek told K-POWER.

"I think people will be uneasy unless robots do look fairly human, but I don't think they'll want them to look *completely* human. That'll make people uneasy about who is and who isn't!

"I guess people would like to live in their own Disneyland, with an Abe Lincoln robot hanging around to help the kids with their homework. Or if some old person is lonely and needs company, they

can get Aristotle to keep them company. Or Marilyn Monroe. There'll be robots everywhere doing just about what anyone wants them to do. And so there's kind of a good side and a bad side to all of this."

"I think people will be uneasy unless robots do look fairly human."



John Sladek can't wait for the robot revolution.

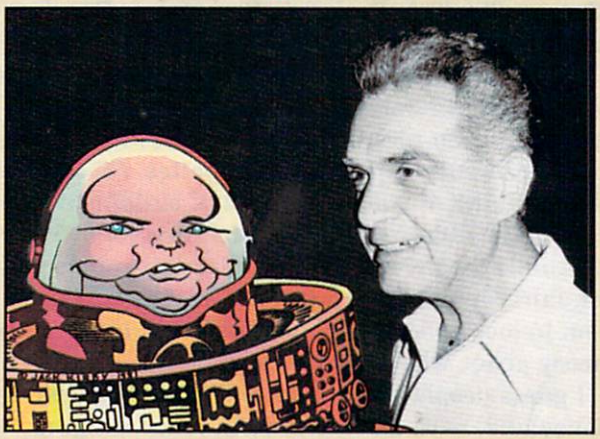
Photo: Jerry Mundis

Kirby's Machine Man

Jack Kirby probably was the first comic-book artist to write about robots, genetic engineering, and artificial intelligence. He's best known for his classic *Fantastic Four* series, which he created with Stan Lee. He also produced *Machine Man* (probably the first comic book to star a robot).

Because Kirby grew up when people thought going to the moon was impossible, he had to use his imagination. "I made up my own robots. I feel it's incumbent on every individual to visualize his own image of robots.

"I'd like to have a robot I can argue with."



Jack Kirby's Egghead: A swashbuckling tin can.

Courtesy of Pacific Comics

Photo: Jackie Estrada

"I have a robot in *Captain Victory and the Galactic Rangers*—one of my stories—that wants to be a swashbuckler. He looks ridiculous as a swashbuckler, but he accomplishes what he wants to do. He's called 'Egghead.' Ridiculous as he looks, he comes out on top.

"I believe that somewhere, out in space, there are living cosmic things similar to Egghead, but of course we haven't discovered them yet.

"I'd be interested in confronting a robot when they're developed to a degree where we can exchange views. Now it can do what you say; you can program it and the robot will obey your thoughts, but it has no thoughts of its own. I'd like to have a robot I can argue with, and ask a lot of questions and get a robot's views on them."

Police Robots

Detective William Sullivan was with the New York Police Department for 23 years. Eight years of that time he spent with the Bomb Squad. K-POWER talked to Sullivan because as a Safety and Training officer he was responsible for acquiring the Bomb Squad's two robots—both Remote Mobile Investigator IIs.

". . . robots are going to be used in places where humans are not safe."

An NYPD Bomb Squad detective with the Remote Mobile Investigator II.

Photo: Gary Kane

Detective Sullivan doesn't think much of robots. He says, "The Bomb Squad will *never* be replaced by a robot. NYC does not have a Robot Bomb Squad. It has a tool that is available to us, just like a gun, or a nightstick. This is no magic robot that runs down the street on two feet. This robot is not going to replace the human bomb technician. Otherwise they'd just stop all the schools and hire mon-

keys to operate this thing."

Sullivan has definite ideas about how robots fit into society. "I think robots are going to be used in places where humans are not safe. We see miners getting black lung disease, and cancer in humans who work around radiation. We didn't know these workers were getting sick, but now that we do, we can replace their jobs with robots."

Detective Sullivan pooh poohs the idea that robots would be welcome in his, or anyone's, home. "It's just as easy to get up and get your own coffee instead of this silly thing running around walking into furniture. Everybody's reading these books and dreaming about a world where no one's going to think. I guess this is what people want—just to sit around watching TV tapes and have this thing bring them their soda. Somebody's got to make the soda."

THE ROBOT QUEEN

Robotorium is a New York City store that sells nothing but robots and robot toys. It has 200,000 regular customers and soon will be opening franchises in the Midwest, Canada, California, Florida and Washington D.C. Debbie Huglin is the owner.

Shattering a few myths about the robots that are now on the market, she says, "Topo and B.O.B. are modified floor polishers. Companies should learn that people want simple units. People don't want big units. They want to add the peripherals later."

She has a very simple solution for anyone who is afraid of a robot takeover. "Get a can of soda, shake it up, flip it open, and spray the robot. That will stop the robot, but not destroy it. This also works on aliens."

"Get a can of soda, and spray the robot. That will stop it."

Photo: Marcia Caro

Debbie Huglin: Robots are her life.

BUSHNELL & B.O.B.

Rumor has it that Nolan Bushnell decided to invent a robot because he always wanted one of his own. Bushnell is chairman of the board of Androbot, which makes B.O.B. (Brains On Board), Topo, and F.R.E.D. (Friendly Robotic Educational Device).

"Robots really would be the ultimate servants . . ."

Nolan Bushnell with some of his robotic creations.

Photo: Courtesy Androbot

Before he got into the robot biz, he founded Atari and invented *Pong*, the first commercial video game. His view of robots in the future?

"[They] really would be the ultimate servants. Robots have the added dimension of giving you the feeling of service with privacy that's difficult for people in this generation to have. You may want to be able to be served and talk privately—or be served in your underwear."

According to Bushnell, robots will let not-so-rich people have servants, because in 1993 robots will cost half of what they do now. Robots will "free men and women from many of the drudgeries they currently have, allowing more and more interesting leisure," he says.

Bushnell is also in favor of the controversial concept of robot-human friendship. "I would like to have a robot as a friend. It wouldn't represent a deep friendship, but a casual, passing relationship." Shut-ins, he says, would particularly benefit from synthetic companionship. **k**

CHRISTINA KELLY *is a New York freelance writer who'd like a robot to do her writing for her.* JANE KING *writes a lot about robots for* K-POWER.

ROBOTS COME HOME!

Someday soon, you won't be dreaming when a robot wakes you up, hands you a fresh towel, and fixes you breakfast. Robots are rolling into homes and adding a bit of R2-D2 to "normal" life. They still have limited capabilities and carry an expensive price tag. But they're fun and exciting—and they bring a touch of fantasy to reality! Here's a mini guide to some of the robots on the market.

B.O.B and Topo: Androbot is building a robot family. B.O.B., the brains of the operation (Brains On Board), has the power of an IBM PC, the company claims. The $2,500 robot comes with a 64K computer, and can speak more than 100 words in a human-sounding voice. At an additional cost, you can equip B.O.B. with sensors and a bar code detector to identify objects and places.

For $1,595, you can buy B.O.B.'s brainless little brother, Topo. When programmed in Logo via an Apple, IBM, or Commodore computer, Topo can talk, memorize the layout of an area, and travel around it.

Androbot Inc. (408) 262-8676

HERO: Heathkit's unassembled HERO (Heath Educational Robot) is great for the do-it-yourselfer with experience in electronics! (You can purchase a preassembled HERO for $2,500.) The do-it-yourself kit costs $1,500. Either way, the robot comes with voice synthesis, an arm, a 4K microprocessor brain, and a hexidecimal keyboard. HERO is difficult to program unless you know machine language, but once you get past that obstacle, it can be programmed to speak, walk, and act as a security guard.

Heathkit/Zenith Educational Systems (616) 982-3631

Hubot: It's a walking electronic entertainment center! Hubot's body parts include a built-in SysCon 128K computer, an AM/FM stereo cassette with an equalizer, dual speakers, and a TV. The programmable robot, by Hubotics Inc., comes with a disk drive, printer, keyboard, and one joystick. Voice synthesis and obstacle recognition devices also are standard features for Hubot. All of these features add up to a heavy-duty price of $3,495.

Hubotics Inc. (619) 438-9028

RB5X: RB Robot Corp.'s RB5X is only two feet tall, but it's chockfull of neat features. The robot has an on-board microprocessor and various software to help it perform. It comes with built-in sensors and a rechargeable battery. It plugs itself in when its batteries are running low! You can program RB5X yourself or use any of the seven available preprogrammed software modules, which sell for between $15 and $25. The basic RB5X costs about $1,795. Some of the extra options include an arm ($895), voice and sound synthesizer ($195), and extra memory ($125).

RB Robot Corp. (303) 279-5525

X-1: Another unassembled friend for robotic hobbyists is X-1. The 25-pound robot costs $400—but needs additional options to do much. Robot Shop's X-1 robot can make noise, light up, and move around. Some accessories for the X-1 are: Battery and charger ($80), solar battery charger ($30), intrusion detection alarm ($70 for ultrasonic sensor, $170 for infrared sensor), water gun ($40), beam light ($10), eight-channel remote radio control system ($700), and 2K TS 1000 computer and keyboard ($300).

Robot Shop (714) 768-5798

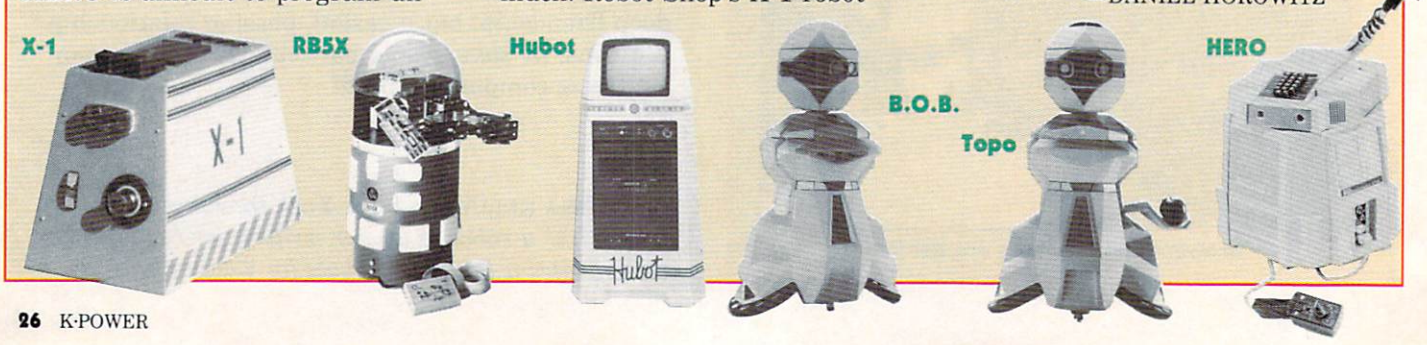
TOT: You can have a big, deluxe ComRo TOT robot for $7,500 or a basic version for $4,500. The three-foot tall 50-pounder has two independently controlled arms, a rotating head, and a spotlight "eye." This deluxe TOT is complete with a television, radio, tape recorder, and stereo speakers. It has a microprocessor brain, an unlimited vocabulary, remote control gripper, and a travel case. The stripped-down TOT has only the on-board microprocessor brain.

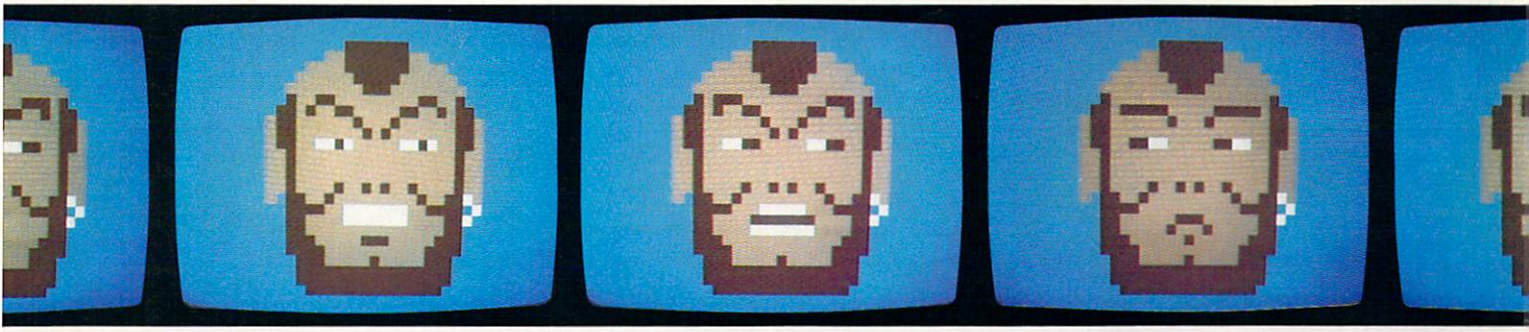
ComRo Inc. (212) 751-7414

GENUS: This robot will hit the market this summer with whopping features and a whopping price tag. The Robotics International robot has been in the making for two years and it could cost $8–$10,000, the company says. GENUS is four-and-a-half feet tall and totally self-contained. It comes with a built-in IBM compatible personal computer, custom keyboard, two disk drives, 256K, and a color monitor.

Robotics International Corp. (517) 788-6840

—DANIEL HOROWITZ





ROLL 'EM WITH *MOVIE MAKER*

Sophisticated software makes an animator out of (almost) anyone

BY MATT DAVIS

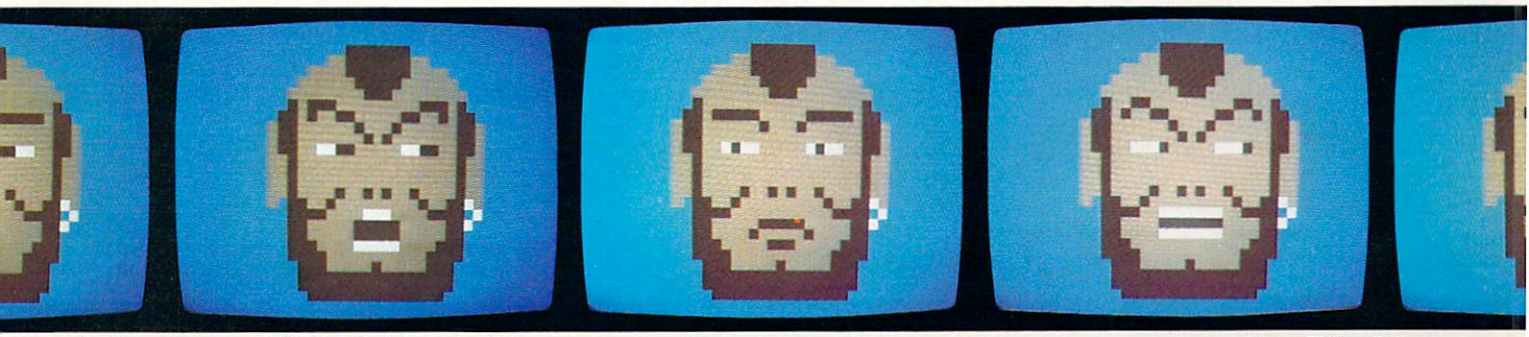
If you know anything about animation, you probably have wondered how Walt Disney ever had the patience to make Donald Duck walk across the TV screen! Just to create the effect of simple movement—like Donald's walking, for instance—is a long and drawn-out process.

To animate, you have to create an image, change it just a bit, change it again and again, and link the images up in a sequence. Disney used celluloid (cel) animation, which consists of individual hand-painted transparent frames that are photographed in succession to look like movement.

Now computer users can use *Movie Maker*. It's a new program designed to bring out the artist, filmmaker, and animator in you, with the least amount of trouble. Creators Guy Nouri and Eric Podietz divided the animation process into five stages: COMPOSE, RECORD, SMOOTH, PLAY, and AUTOPLAY. *Movie Maker* loads each stage into the computer one at a time to best use the computer's memory. *Movie Maker* runs on Atari 400s and 800s with 48K. 64K Apple and Commodore 64 versions should be out in May, and IBM PC versions are scheduled for release in June.

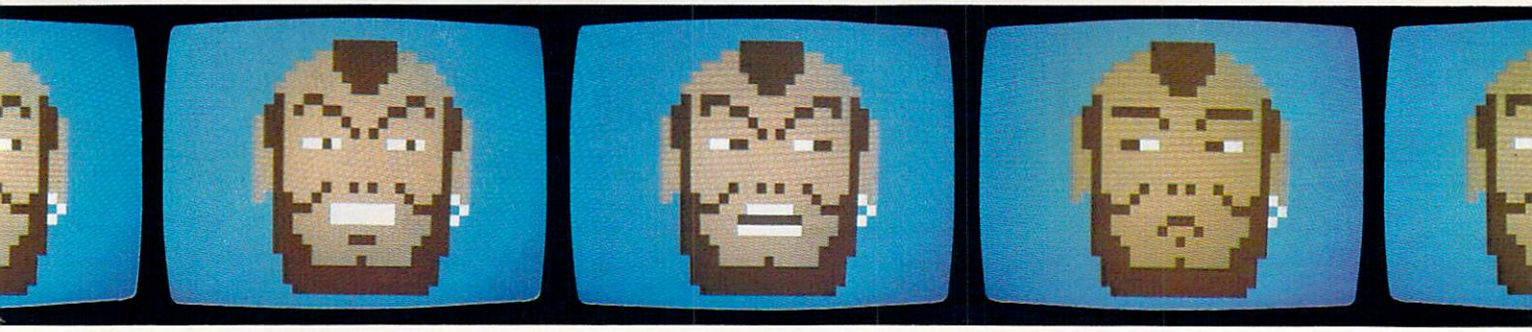
Using the stages, you can dream up your own shapes, or use images from the four groups of shapes on the master disk. You choose among science-fiction shapes, including robots; actor shapes, including a Charlie Chaplin figure; space shapes, such as spaceships and explosions; and a dog, which is a Pluto-like canine shape.

After you've picked or drawn your shapes, you animate them. You then can immediately view your masterpiece and change it right away. Armed with lots of patience and lots of time, with *Movie Maker* you'll feel like a full-fledged Disney pro. It's an amazing piece of software with an almost limitless list of animation possibilities.



Mr. T. computer art created by Matt Davis on an Atari 800.

Photos: William Gallagher



Getting started is fairly easy. The manual guides you through the first few steps of animating the dog shape from the master disk. After you've used your joystick to pick a few dog shapes, hit the "A" (for action) key, then the space bar, and your shape is off and moving. It's easy to adjust the speed by pressing the "F" button and then a number (on the Atari). Changing background colors is no sweat, either. Simply hit the "C" key and then a number from "00" to "15." Change the shades of each hue with the up and down arrow keys. (*Movie Maker* lets you access all 128 of Atari's colors.)

LIGHTS! CAMERA! ACTION!

After you feel comfortable with the basic command structure, give the more sophisticated features a try. *Movie Maker* lets you link shapes together in sequences, and then string sequences together to create a "movie" of up to 300 frames in length. To do this you use the COMPOSE mode from the main menu. When drawing with your joystick you can use up to four colors. A WINDOW function lets you zero in on a certain part of your shape—say, the eye you want to blink in a face you're drawing—without changing the rest of the shape. This is great because it means you don't have to draw the same face over and over again.

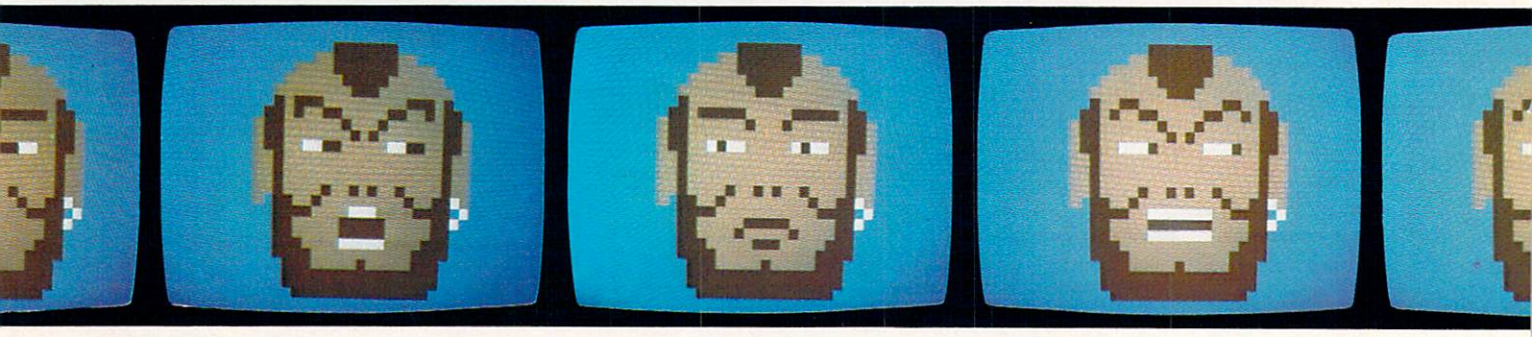
An incredible assortment of options helps you round out your creation, adding to it and refining it until it's as close to perfection as you want. You can paint backgrounds, add sounds (four voices, with eight different noises per voice), include up to six different moving shapes (or objects), duplicate and mirror images, and even put titles and words into your "movie." Developing this kind of complex animation demands an arsenal of keyboard commands and hours at the keyboard, manual in hand.

IT GETS EASIER

There's a lot to learn. But the more you use the system, the easier it gets because it's set up very logically. Menus are short and simple. Single keystrokes accomplish entire commands. The "E" key erases everything framed in a window. "Z" zooms an image, or magnifies it for special, minute work. "L" loops a shape you've created. For instance, if your face takes three separate images to wink and smile, hitting "L", then "6" would make your face go through that three-part sequence six times. Almost every key on the keyboard represents a different command.

Because I love to draw and I've always been curious about animation, the complexity of *Movie Maker* doesn't bother me. And creators Guy Nouri and Eric Podietz have made it clear there won't be a *Movie Maker II*. They packed everything they could into this software. If it were any simpler or less sophisticated, it wouldn't be as versatile or as well worth the $60 it costs. It's the kind of program you'll have to (and want to) spend a lot of time on. The Mr. T. I worked up shows just a fraction of the program's possibilities. I didn't know too much about *Movie Maker* at the time. I just improvised and had fun. Maybe next time, I'll add some choppers.k

MATT DAVIS *lives in New York and is a member of his high school film club. He illustrated the Computer Camp Counselor cartoon in the March* K-POWER.



BEHIND *MOVIE MAKER*: SOFTWARE GREEN BERETS

IPS partners Eric Podietz and Guy Nouri.

If Alfred Hitchcock is well known for bringing suspense to the big screen, Guy Nouri and Eric Podietz will be remembered for bringing animation to the *computer* screen. They're partners in Interactive Picture Systems, the company behind *Movie Maker*.

Guy and Eric worked on the *Movie Maker* concept for six months, day in and day out. "It was an idea people said we couldn't do," Guy told K-POWER. "And after six months of dreaming up dreams to make things animate, we had *nothing*. A day later, after we'd exhausted everything, the idea came!"

Movie Maker eventually took 18 months of five programmers' time—a long time in the software biz. But that's no sweat for Interactive Picture Systems. Guy and Eric had spent a similar amount of time creating *Paint*, another program published by Reston Software in 1982.

"We don't want to do a program in less than six months—no matter *what* the money," Guy says. "We're looking for two-year programs. In a couple of years, people will be demanding software with depth. Depth doesn't happen over six months. And you'll never see a *Movie Maker II* because *Movie Maker* has that depth."

As an independent software firm, IPS comes up with software ideas and presents them to publishers. *Paint* and *Movie Maker* came out of Guy's dreams to see art and animation on the computer screen (he's a painter). Guy does the design work and Eric and other IPS programmers, Jimmy Snyder and Mark Scott, do the programming.

IPS has donated advanced versions of the programs, *Movie Maker Professional*, to New York University's Alternative Media Center, where it's used as a teaching device, and to San Francisco's Exploratorium Museum, where it's used to create animated exhibits. Members of the Motion Picture Screen Cartoonist Union, Local 841, are using *Movie Maker* to help prepare for future jobs in computer animation.

The company's 17 artists, programmers, and specialists (music, art, and animation experts) work out of Philadelphia. Guy, who is president, works out of New York. He says the people at IPS are together because they share the same dreams. "We needed each other," he says. "I've found out in my life that you can't do everything on your own. There's a lot to learn from other people."

He calls IPS the "Green Berets" of the software biz because of the support they give each other. "It's very important that we're a team," he explains. "It's a myth—that 'designers-as-star' business. There's definite star talent, but we think of ourselves more as a constellation than as a single star."

IPS has other programs up their sleeves that will incorporate story telling and artificial intelligence, Guy says. In the meantime, *Aerobics*, *Trains*, *Dance*, and *Grandma's House* (all published by Spinnaker) are IPS creations now on the market.

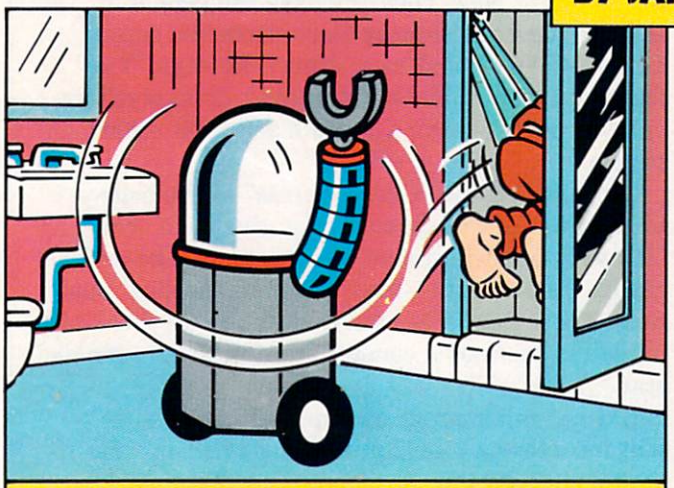
Photos: MPG Photos

Some of the Green Berets of Software (top row, from left to right): James Ehlers (with phone), Mark Scott and Gumby, Edwin "Chip" Hensel, Guy Nouri, Bob Svihovec (with helmet), Ken Appleman. In the bottom row: Susan Rubin, Eric Podietz (with white cat), Sanford "Chip" Kaye, Jimmy Snyder (with black cat). Not pictured: Cindie Merton, Chuck Beury, Linda Mittel.

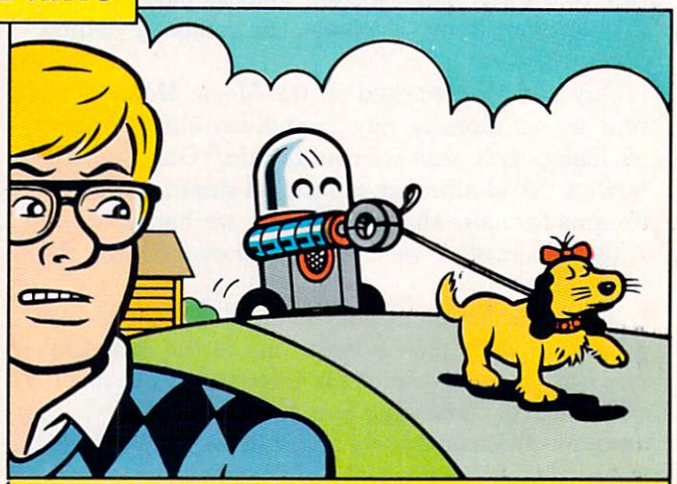
YOU KNOW YOUR ROBOTS GONE TOO FAR WHEN . . .

Robots are très chic nowadays. It seems that robots soon will be as popular as The Cabbage Patch Kids. Then, we'll all be reading stupid humor articles about robots . . . like this one!

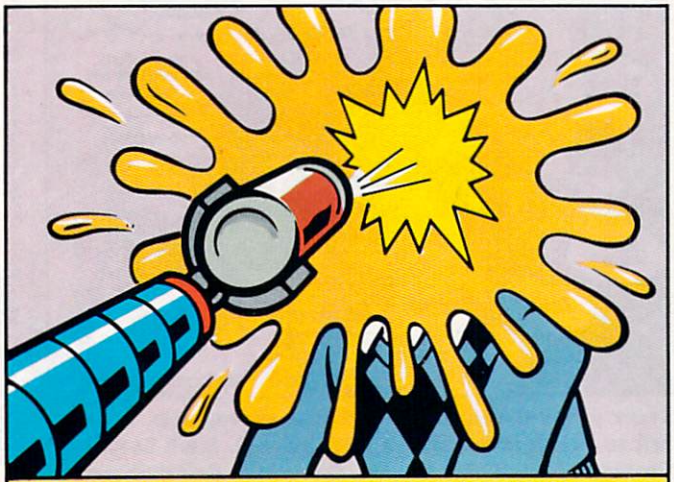
BY JANE KING



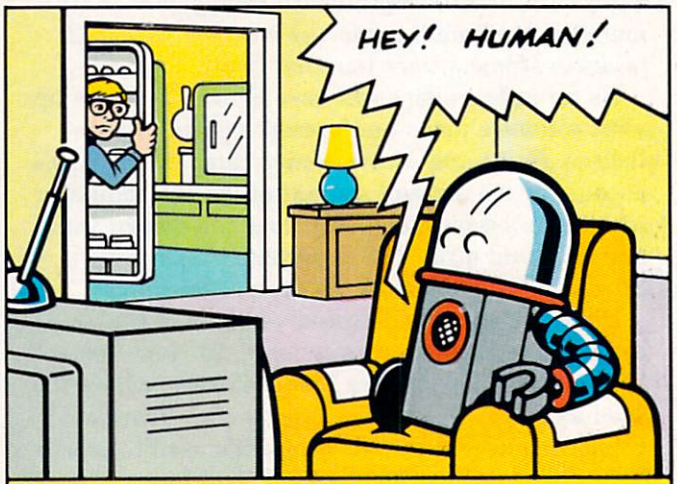
It doesn't just wake you up, it also throws you into the shower!



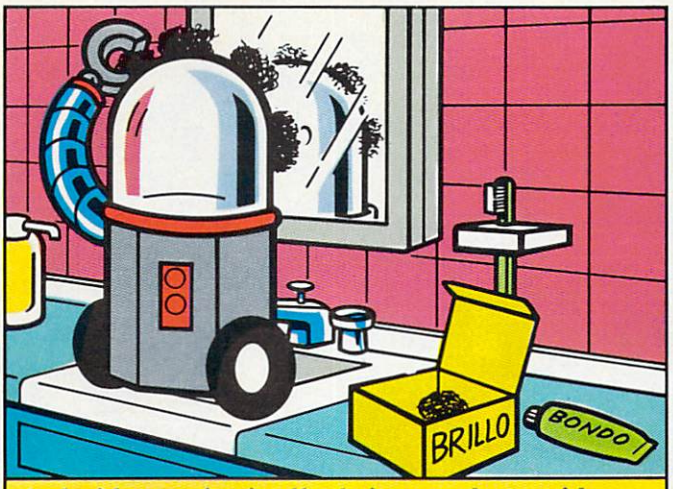
You find out it's been making extra dough—walking the neighbor's dog!



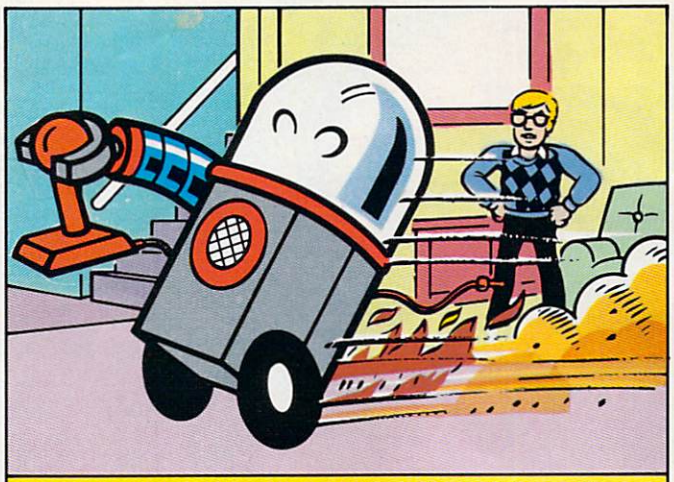
After bringing the soda you asked for, it shakes it up and pops the top open right in your face!



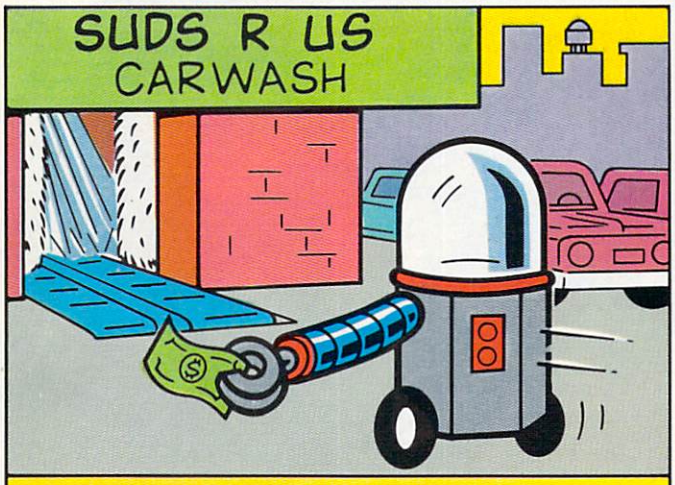
Then, it tells you to go get your own lousy soda, and when you go to the refrigerator, it says, "As long as you're up, get me a pizza!"



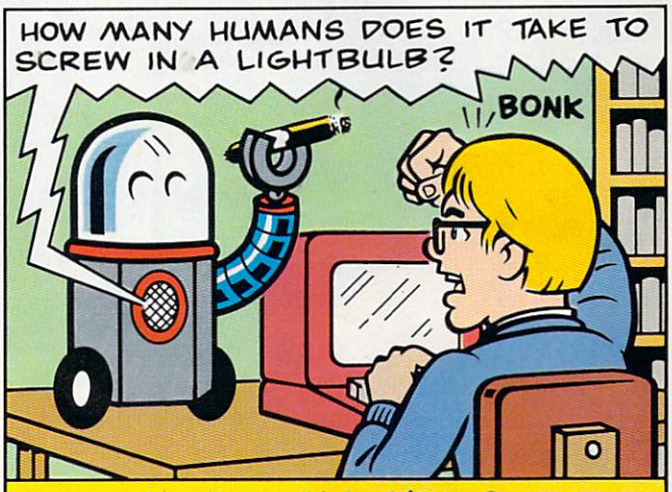
It decides to give itself a hair transplant—with Brillo pads!



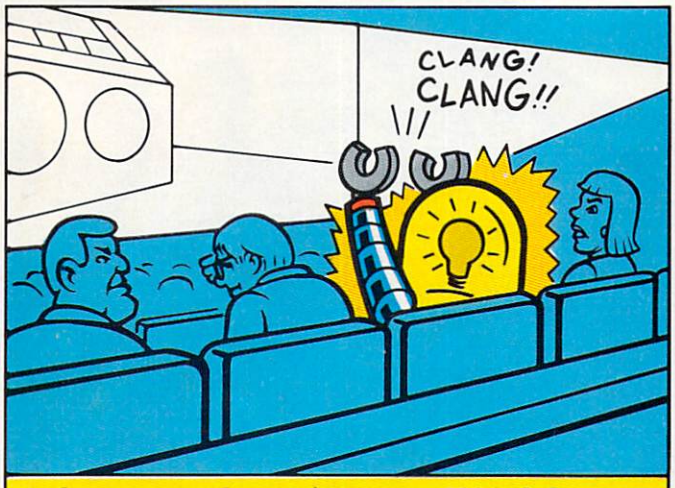
It starts doing wheelies and burning rubber all over the house.



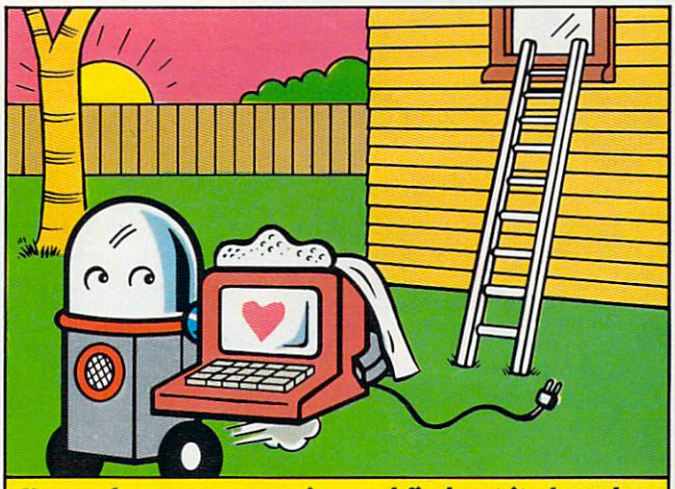
It makes you fork over five bucks so it can go to the car wash and get simonized.



It starts telling "human" jokes! (Two. One to program the robot, and the other to find it!)



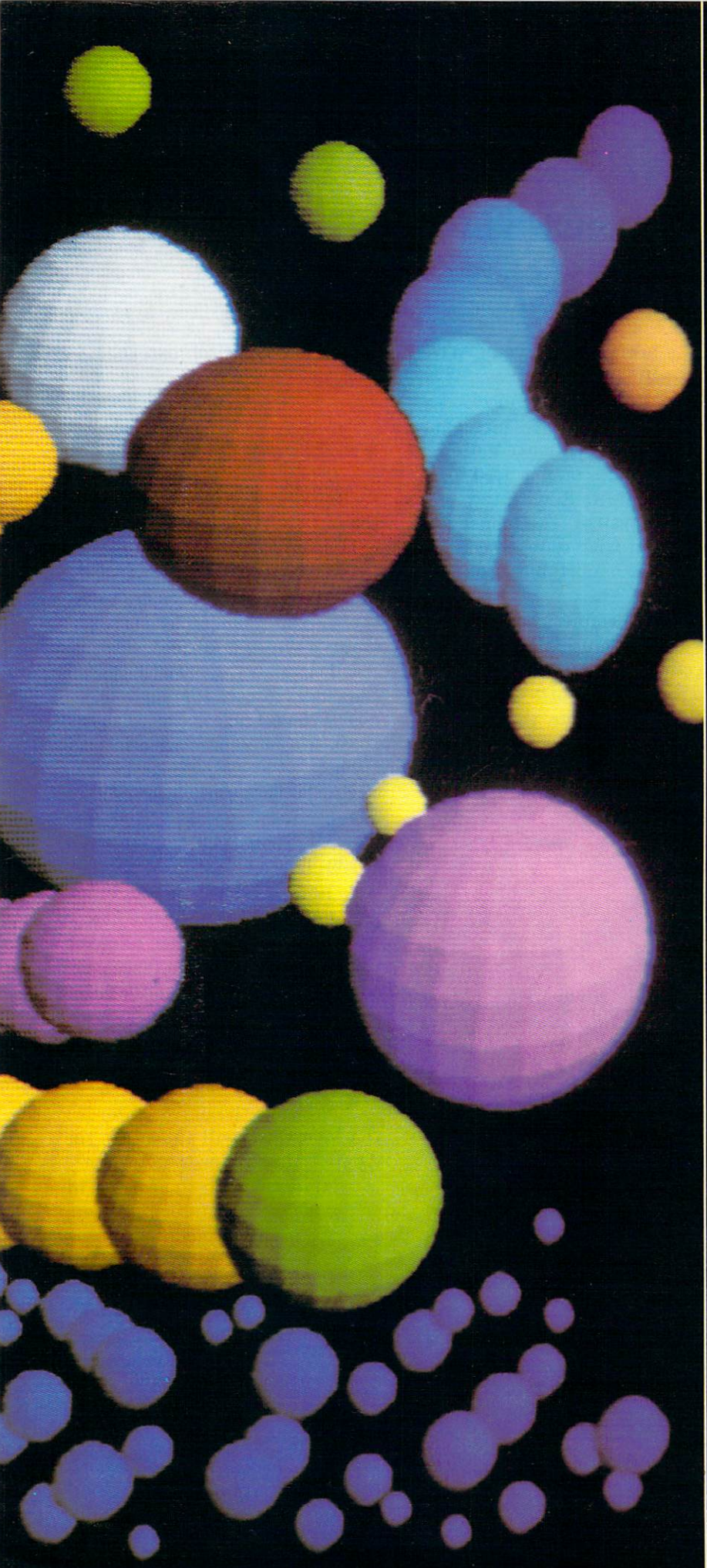
It drags you to the movies to see *2001: A Space Odyssey*, and cheers a little too loudly when HAL the computer takes over the ship.



You wake up one morning and find out it eloped with your personal computer! k

Illustration: David Coulson


(C) 1982, Vectrix Corp



k POWER™

GRAPHICS GALLERY MAY 1984

"IN THE BEGINNING"

COMPUTER-GENERATED ART BY RICHARD KATZ

"In the Beginning" reminds some people of the universe just after the big bang. Others think the image is a bunch of golf balls. Still others see atoms and molecules. I guess it's safe to just call them spheres.

This month's computer art is the hallucination of an over-worked programmer who had just put in a 16-hour day. It was midnight and a very vivid, three-dimensional picture of atoms and molecules formed in my mind. I used a grid-mapping program, and in a few hours created "In the Beginning." I took a picture—and then erased the screen.

My co-workers saw a slide of "In the Beginning" and persuaded me to re-create the picture. What took me just a few hours the first time, took eons the second time around! But I finally did it, and "In the Beginning" soon became the most popular image generated by Vectrix Corporation. k

RICHARD KATZ *is a founder and vice president of Research and Development for Vectrix Corporation, manufacturer of color graphics frame buffers, in Greensboro, North Carolina.*

MACINTOSH:

A HANDS-ON REVIEW

BY CHARLES H. GAJEWAY

Apple's Macintosh isn't designed to be a home computer but is so easy to operate, it might find a place alongside the most popular home computers out there. Instead of looking at the personal computer as a highly technical tool, Apple designed the Mac as an easy-to-use appliance. What makes Mac different is its mouse. (Apple calls the mouse a "small, rolling box" that "fits in your hand.")

The mouse moves a pointer around on the screen, so you can choose an item from the on-screen menu of icons. Push a button on the mouse, and you instantly begin working with the program or utility represented by that icon. No more learning a new set of commands for every program!

MACDESIGN

The Macintosh has the same 68000 microprocessor as Apple's Lisa computer, which makes it a fast and powerful personal computer. (Some applications run up to twice as fast as they do on the IBM PC, the standard for business computers.) Mac has 128K of RAM, a built-in disk drive with 400K storage space, and a high-resolution, black-and-white, built-in monitor. Mac also has sophisticated sound capabilities, able to reproduce a human voice. The whole package weighs only 20 pounds, and is portable.

The 58-key keyboard is compact, and attaches to the system unit with a coiled cord. (Thanks to the mouse, you don't need function or cursor keys.) The keys are full-sized, and nicely angled. At first glance, the nine-inch display screen looks too small, but you soon get used to it. Besides, it fits in with the rest of the system. The mouse is rectangular, with rounded corners, so it's comfortable in hands of all sizes.

It's easy to connect any Mac peripheral, because all of the connections are external: Two high-speed serial ports (one can be used for a printer, the other for a modem), a mouse port, and a port to connect an external disk drive.

Apple's Macintosh: an easy-to-use appliance

DESKTOP MACPOWER

Turn on the Macintosh by inserting a disk, then switching on the power. The disk whirs, a chime sounds, and a few seconds later, a banner reading WELCOME TO MACINTOSH flashes on the screen. The display is extremely sharp and clear. Seeing it will banish your worries about the small screen. It's made up of over 175,000 pixels—more than three times as many as an Apple IIe has.

BASIC isn't built into the Mac, as it is on most computers. The Microsoft BASIC interpreter ($199) is the only BASIC available now. It gives you 24K of free memory. Macintosh BASIC ($99) is due for summer release, and is expected to run faster and provide more user memory.

MACCESSORIES

Right now, the only printer the Macintosh will support is the Apple Imagewriter ($495 when you buy it with the Mac). This dot-matrix printer has been especially modified to produce high-density graphics. It can also mix text and graphics. Although it's not letter-quality, it looks sharp and clear.

Other accessories from Apple

include a padded carrying case ($99), a numeric keypad ($129), an external disk drive ($495), modems (300 baud—$225, 1200/300 baud—$495), and an anti-theft security kit.

Mac's main drawback is there's no games or other entertainment software out yet. Apple has promised there will be lots of that stuff available soon, though. Another drawback is the lack of color. The Mac is expected to upgrade to color soon, but many people aren't bothered at all by the lack of color, because the black-and-white display is so clear.

The Macintosh costs $2,495—that's considerably more than an Apple IIe or a complete Commodore system. But for people who find other computers too complicated or businesslike, Mac's the best. Its 128K is twice as much as the most powerful home computers, and Apple says that upgrades to 256K or 516K may be available soon.

The Macintosh is a machine for the future, both in the home and in the office. **k**

CHARLES GAJEWAY *evaluates computer hardware and software for Merrill Lynch & Co. in New York, where he works.*

ONE HACKER'S VIEW

When I woke up on January 24, I remembered that today was the big day—the day the new Macintosh would be released. I'd been looking forward to this for months!

I got to COMPUTERWORKS in Westport, Connecticut, exactly at 10:00 a.m. and was disappointed to find out they couldn't show the Macintosh until the official release time of 3:00 p.m. They had to coincide with the West Coast announcement—which would take place at about noon, California time.

Needless to say, I went back to COMPUTERWORKS at 2:45. This time, I wasn't disappointed. The Macintosh was better than I could have ever imagined! The two programs they used for demonstration were *MacPaint* and *MacWrite*. *MacPaint* is a graphics drawing program with more detail than I thought possible on a home computer. (The only problem is color isn't available on the Macintosh yet, but Mac makes up for this by having 38 different patterns to choose from.)

MacPaint is an amazing system for drawing and manipulating pictures. You can use the LASSO function to outline any portion of the screen, and then move that block to any place on the monitor. There also is a magnification function called FAT BITS, which allows the user to edit a very small part of the screen, pixel by pixel. It's similar to the magnifier in Bill Budge's *Pinball Construction Set*. *MacPaint* also lets the artist type words on to the graphics screen in many different fonts, styles, and sizes.

MacWrite looks like a fantastic word processor. Everything is mouse-controlled, and word processing will never be the same again. The old-fashioned word-processing control keys are replaced by icons, and the icons are activated by pressing a button on the mouse. *MacWrite* has a super selection of fonts and sizes, and all of them appear on the screen exactly as they will look in a printout. You can even design your own typefaces.

The Macintosh price may seem high, but it includes the monitor, keyboard, and built-in disk drive, along with the mouse. *MacPaint* and *MacWrite*, together on disk, are included in the introductory period; thereafter they will cost about $95. The disks, too, are another new Apple "first." They store 400K each and are only 3½ inches in size. The magnetic strip is protected by a sliding door when the disk is out of the drive, eliminating many potential problems. The new disks are very strong and cost $49.95 for 10.

Software companies have had the Macintosh for two years, so they've had plenty of time to develop software for it. Thirty programs already are available, including Microsoft's *Multiplan*, and the popular *PFS* series.

Along with the little Mac, Apple has released the Lisa II (also called the "Big Mac"). "Big Mac" runs all of the Macintosh software but has 512K and allows multitasking like the Lisa does.

VITAL STATS:

MEMORY: 128K (plus 64K ROM)
USER MEMORY AVAILABLE IN BASIC: 24K
KEYBOARD: 58 typewriter-style keys; numeric keypad is optional
VIDEO OUTPUT: Black and white monitor (built-in)
GRAPHICS: 512 × 342 resolution; no colors
SOUND: 4 voices, 12 octaves
SUGGESTED RETAIL: $2,495 (includes keyboard, disk drive, and monitor); $2,990 with Imagewriter printer.

—STEVE HOROWITZ


INN 1 2 3 4 5 6 7 8 9 10 R
VSTR 0 1 0 3
HOMG 0 2 1 1
4
4

BREAK INTO THE BIG LEAGUES!

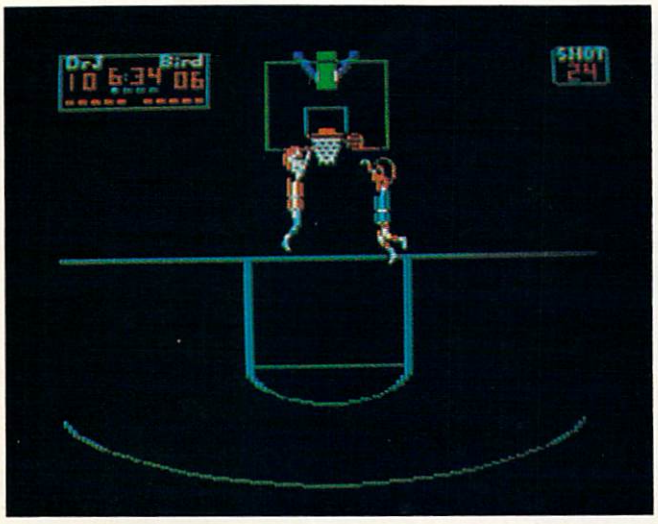
Sports simulation games let you pitch, pass, and punt . . . No sweat!

BY BOB CONDOR

Any sports fan worthy of a ticket stub fantasizes about what it's like to play in the big leagues. But most of us just dream of athletic glory. Now, sports fans, brace yourselves. There's an exciting roster of fantasy-filled pleasure awaiting you: computer sports games.

One-on-One, from Electronic Arts, heads this list. It's a dream match-up basketball game that pits Philadelphia 76er Julius Erving against Boston Celtic Larry Bird.

The game makes you think. Whether playing a friend or the computer, you have to keep in mind both players' computerized strengths and weaknesses. If you're the Doctor, you'll have all the fancy moves inside and be a step quicker. But if the computer is Doc and you're Larry Bird, you'll be more physical, rebound better, and play a stiff brand of defense. You can also figure out how tired the players are and who has the hot shooting hand. To top it off, you can shatter the backboard on a particularly hard dunk and get an instant replay.



As you learn the game's nuances, you'll soon be making superstar moves. I found myself swishing turnaround jumpers and slamming dunks in no time—things I'd never expect to do in my own lifetime.

BATTER UP!

The leadoff hitter in the lineup of better baseball games is *Star League Baseball,* from Gamestar, Inc. There's a whole teamful of major-league role-playing in this game. For starters, you can choose to be one of two pitchers: "Heat" Muldoon or "Curves" Cassidy, each with a repertoire of eight pitches. If Heat or Curves gets in trouble, there's even a reliever to call on, "Knuckles" Flanagan.

You'll also get to play a dugoutful of batters, with a choice between "liners" or "sluggers." The liners make contact and hit singles; the sluggers whiff more but also hit the long ball more often.

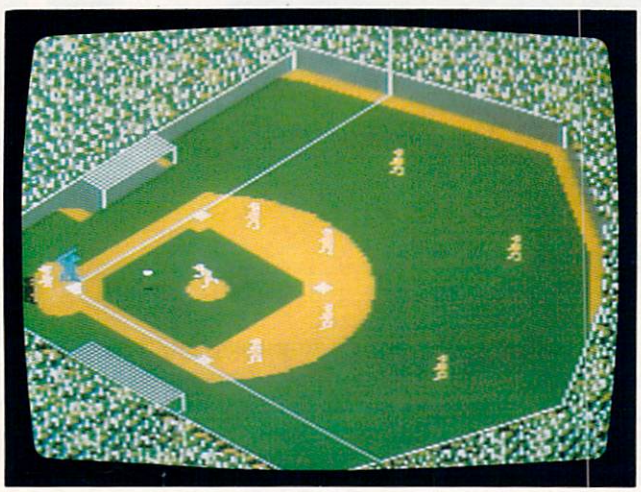
My favorite part of *Star League* is the cat-and-mouse game possible between pitcher and base runner. The unique screen angle makes it perfect to watch the pitcher as you lead off first base. The man on the mound can be tricky, but a *real* joystick jock can dance around the bag as menacingly as Rickey Henderson.

Then there's *Statis Pro Baseball* by Avalon Hill. You're the manager. Pick your starting pitcher and lineup from actual 1982 team rosters of all major league teams (1983 statistics are now available for $20). Players are rated by a set of statistics reflecting their performances that season.

As the manager of the team at bat, you can signal a bunt (squeeze or sacrifice), steal, or hit-and-run. And you can wave a man to take an extra base or tag up on a fly ball. The opposing manager, whether human or the computer (a tough foe), can call for an intentional walk of a dangerous hitter or

adjust the fielders. The games I played seemed to match up quite well to what you might expect from the players in an actual game.

A nifty feature of *Statis Pro* is the filing capability for entering and playing your own fictitious (or real) team. Take it from a *Statis Pro* junkie, this game can be habit-forming.



HIKE!

If football's your favorite, play Gamestar's *Starbowl Football*. It's easy to get caught up in this one. As the quarterback, you can select from 196 different play combinations. When on defense, you can position your defensive unit (each squad has six players), anticipating what your opponent (human or computer) will call. Once you've set two cornerbacks and the three-man line, you'll have a free safety who can be controlled with the joystick during the play.

The game plays authentically. You feel like you're at the line of scrimmage, ready to dig in and make the play. The real trick to *Starbowl Football* is learning to perfect the timing between passer and receiver, no easy maneuver for the beginner.

SAVE!

Another way to get your kicks from computer sports games is with two of the better soccer offerings. Thorn EMI's *Soccer* plays more realistically than *International Soccer* from Commodore, but the Commodore entry is more lively. *Soccer* has the standard 11 players per side, and all can work at world class form (if you select the highest level). The *Soccer* graphics are good, too, although the players are a bit small. Up to four players can use joysticks, a rarity among sports games. In fact, you and your friends can even team up and play the computer.

International Soccer lacks major league polish in some ways, but it *is* entertaining. For one thing, the players are larger, though there are only seven per side. A special treat is the goalie. He dives, jumps, and sprawls, making spectacular saves if you push the fire button precisely. You'll be amazed the first time you see this acrobatic defender make a headlong stretch save.

CHECK!

Get your iceskating kicks with *Major League Hockey*, another Thorn EMI product that uses up to four joysticks. The first time you try it out, it'll be like your first spin on skates: awkward yet invigorating. Up to four players scoot the length of the rink, shooting, stickhandling, digging in corners, and checking. With a little seasoning, you'll be feeling like another Wayne Gretzky.

Sports software may never match the action of shooting hoops in a friend's driveway or playing varsity football, but it *will* let you coach the Yankees and slam dunk against Dr. J. What more could you ask for? **k**

BOB CONDOR *is managing editor of SPORTSWISE magazine.*

THE ROSTER

ONE-ON-ONE
Apple, 48K (disk)
Electronic Arts, (415) 571-7171
$40

STAR LEAGUE BASEBALL
Atari, 32K (disk and cassette)
Gamestar, Inc., (805) 963-3487
$31.95

STATIS PRO BASEBALL
Apple, 48K (disk); TRS-80 Models I and III, 32K (disk) and 16K (cassette)
Avalon Hill, (301) 254-5300
$25 (cassette) $35 (disk)

STARBOWL BASEBALL
Atari, 24K (disk and cassette)
Gamestar, Inc., (805) 963-3487
$31.95

SOCCER
Atari, 16K (cartridge)
Thorn EMI, (212) 977-8990
$39.95

INTERNATIONAL SOCCER
Commodore 64 (cartridge)
Commodore, (215) 431-9100
No suggested retail price

MAJOR LEAGUE HOCKEY
Atari, 16K (cartridge)
Thorn EMI, (212) 977-8990
$39.95

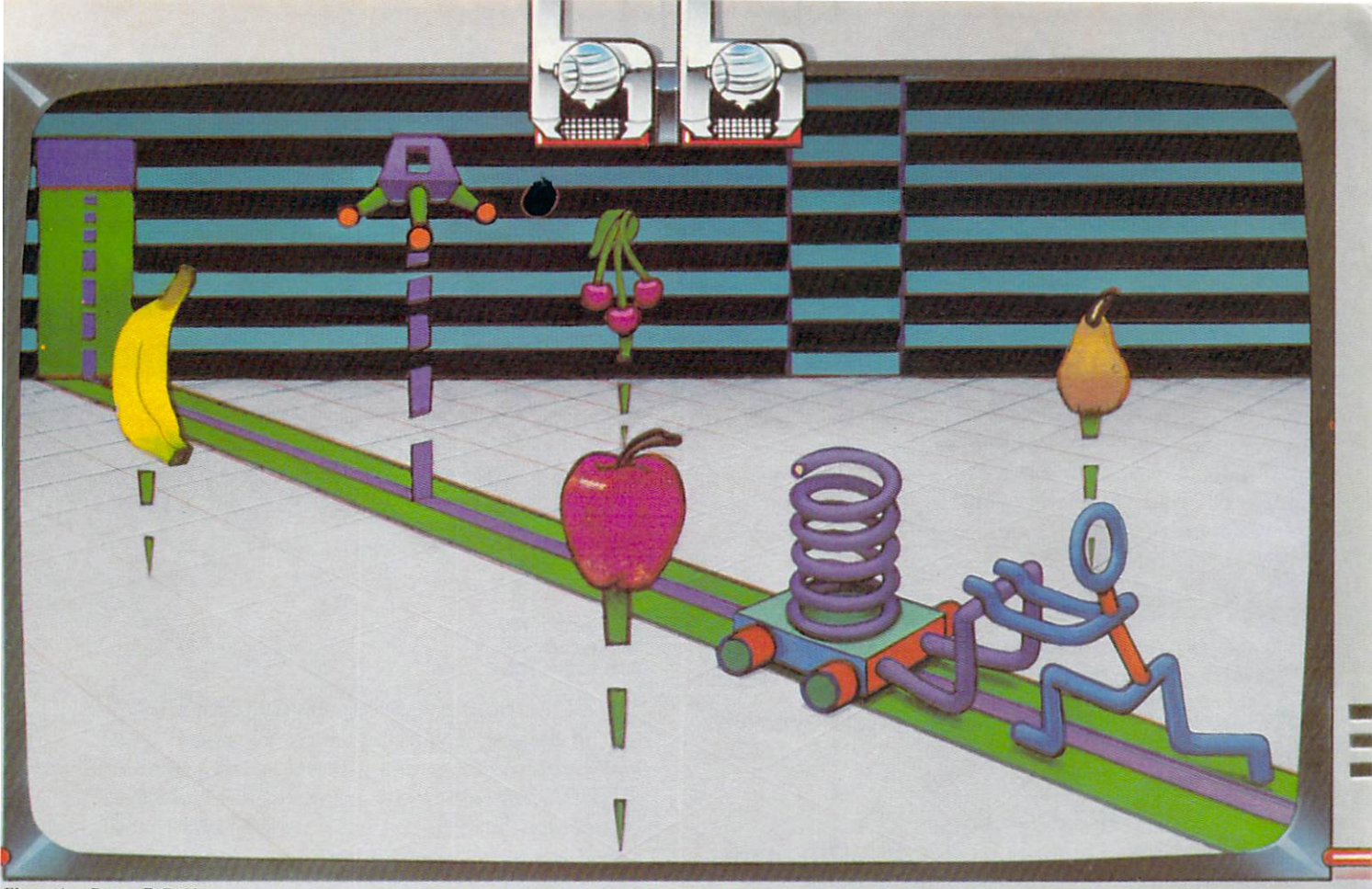
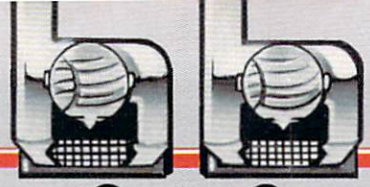


Illustration: Barton E. Stabler

HACKER HEAVEN

M · A · Y

Illustration: Jim Cherry III



K - B L O O P E R S

So, we made a few mistakes. We're sorry. Here's where we tell you (and you tell us) which ones and how to fix them.

As some of you may have already figured out, lines 290 and 480 were wrong in the TI version of *Mysterious Message* (Premiere issue, p. 46). Here's how those lines should read:

```
290 DISPLAY AT (15,G-2) SIZE(5):" /";CHR$(124);CHR$(92
);" "
480 FOR I=0 TO 18::READ Z::DISPLAY AT (1,I+6) SIZE(1):
CHR$(Z);::A$=A$&CHR$(Z)::CALL SOUND(100,-1,1)::NEXT I
```

We also forgot to tell you that the program requires TI Extended BASIC.

We're sorry.

WHIZ KIDS GOOF-UPS

Hacker **Chris Heise** of **Westerville, OH,** joined our Blooper patrol with this letter to us: "In your *Whiz Kids* program (Premiere issue, p. 36), there were two errors. First, in the Base Version, Line 320 will not work. This is because the computer sees variables (320 GOOD=75) as the first two letters. In this, GO is part of the BASIC statement GOTO."

Chris also added that the Timex version of *Whiz Kids* wouldn't work for the same reason, but he ends his letter by saying, "P.S. You make the best new magazine. Far better than *Enter* or *Micro-Kids*."

Well Chris, you're right about the base version of *Whiz Kids*. It'll work fine on the Model 4, but Commodore 64 and VIC-20 owners will have to change line 320 to read:

```
320 GD = 75
```

But the Timex version works fine! It's tricky: In lines 350 and 360, FAST and SLOW are variable names, not BASIC statements. So you have to type them in letter by letter: F-A-S-T, instead of just pressing "F" and expecting the whole word FAST to appear on the screen. Thanks for setting us straight and for the compliments.

Both **Joseph Hausenstaub** of **Lakewood, OH,** and **Bryn Thompson, Tacoma, WA,** found a way to make *Whiz Kids* run on their TI-99/4As *without* using TI Extended BASIC. First, you have to put different statements on separate numbered lines, while Extended BASIC lets you put them on the same line separated by double colons. So, for example, you have to convert line 730 from

```
730 GOSUB 780 :: GOSUB 980 :: GOSUB 980
```

into three separate lines:

```
730 GOSUB 780
731 GOSUB 980
732 GOSUB 980
```

The same thing goes for lines 570, 640, and 740.

And second, if you don't have Extended BASIC you can only use a line number, not a statement, after the THEN in an IF. . .THEN statement. This means you have to change lines 820 and 870 to read:

```
820 IF TYPIST <> 1 THEN 830
870 IF MAIN >= LINES THEN 910
```

and add the following lines:

```
825 SPEED = RND*CHARACTER*PROFICIENCY
880 PRINT
```

Joseph and Bryn, all the TI owners out there who don't have Extended BASIC thank you.

ADAM ADDICT

ADAM owner **Marc D. Andre,** of **Pleasant Hill, CA,** wrote this about the *Whiz Kids* computer program. "I think your magazine is great. But in your February 1984 "Whiz Kids" issue you modified only one program for the ADAM. Please explain and modify the following programs to be compatible with the ADAM: *Whiz Kids* (p. 36), *Symphony in 3-D* (p. 44). If you have any other ADAM programs, please send them to me. Thanks. I just got the ADAM and I want to get a lot of programs for it. (You know, us ADAM owners want to get in the fun also.) Don't worry, your magazine's still the best."

Marc, since our first issues, ADAM's SmartBASIC has been revised. Now, you can type in the Apple version of *Whiz Kids* (February issue, p. 37) and it should work unchanged on your ADAM if you have the latest BASIC.

Once you've loaded SmartBASIC, you can find out if you have the latest revised version by entering PRINT PEEK(260). ADAM will respond by display-

K - B L O O P E R S

ing which version number you are using. If your version number is lower than 79, contact your local Coleco service center for replacement (call (800) 842-1225 for the address of the center nearest you).

We didn't publish an ADAM version of *Symphony in 3-D* because there are no music commands in SmartBASIC (just the Apple's CHR$(7) beep). Coleco promises that SmartBASIC II will contain music commands, but meanwhile they're not telling how to use machine language to play music on the ADAM. (Has anyone out there discovered how? If so, please let us know.)

You still can run the graphics part of *Symphony in 3-D* on your ADAM; you'll just have to do without the accompanying music. Use the Apple version (February issue, p. 44), just omitting the music commands: lines 30, 1000, 2000–2020, and the :GOSUB 1000 in lines 130–160.

K-POWER runs programs for ADAM every month. And with your ADAM you get a free one-year subscription to *ADAM Family Computing*, one of K-POWER's sister magazines, which has ADAM-only programs in every issue. And if that's still not enough, you can find Apple programs everywhere: if they don't use PEEKs, POKEs, or CALLs and can live with a 31-character-wide display, they'll usually work on ADAM without change.

WHERE'S COMMODORE?

Commodore owner **Eric Alberdi, Twin Falls, ID,** wrote Hacker Heaven in search of the Commodore 64 version of *Symphony in 3-D* (Premiere issue, p. 44): "Could you possibly send me a copy of the C-64 program or publish it in your next issue of K-POWER?"

Unfortunately, Eric, we don't have room to publish versions of all programs for all computers. One reason we didn't publish a Commodore version of *Symphony in 3-D* is because Commodore BASIC doesn't have a line-drawing statement like the Apple's HPLOT . . . TO, the Atari's PLOT . . . DRAWTO, and the Coco and IBM PC's LINE function.

But there's hope! In the March K-POWER (page 46), we published a BASIC program that you can use to do the same thing as any of these BASIC line-drawing statements—only *much* slower. Or you can write a machine-language routine to do it up to speed (we may publish a routine like that in a future issue). Then just add random notes from a major scale, using the 64's great synthesizer capability, and you've got it!

Eric, if you manage to do this translation, we'd love to see it. And if anyone else out there has already translated *Symphony in 3-D* for the Commodore 64, please let us know.

C O M P U C O P I A

RADIO SHACK/*CLEAN-UP*

TRS-80 Model III • 16K RAM

```
10 CLEAR 500:CLS:INPUT "DO YOU WANT INSTRUCTIONS (Y/N)
";I$:IF LEFT$(I$,1)<>"Y" THEN 50
20 CLS:PRINT "THE OBJECT OF CLEAN-UP IS TO PICK UP ALL
 OF THE LETTERS AND":PRINT "SYMBOLS WITHOUT TOUCHING T
HE GRAPHICS CHARACTERS OR CROSSING":PRINT "YOUR OWN TR
AIL.":PRINT:PRINT "USE THE ARROW KEYS TO GUIDE YOUR MO
VEMENT."
30 PRINT:PRINT "(PRESS ANY KEY TO PLAY.)"
40 A$=INKEY$:IF A$="" THEN 40
50 CLS:BL=0:SC=0:INPUT "STARTING LEVEL (1-50)";S:IF S<
1 OR S>50 THEN 50
60 CLS:PRINT "SCORE =";SC
70 FOR X=0 TO 127:SET(X,3):SET(X,47):NEXT X:FOR X=4 TO
 46:SET(0,X):SET(127,X):NEXT X
80 FOR X=0 TO S*3-1
90 P=RND(821)+130:IF X/3=INT(X/3) THEN IF PEEK(P+15360
)<33 THEN PRINT@P,CHR$(RND(94)+32); ELSE 90
100 P=RND(821)+138:IF PEEK(P+15360)<33 THEN PRINT@P,CH
R$(RND(63)+128); ELSE 100
110 NEXT X
120 X=5:Y=5:U=0:H=0:A$=INKEY$:FOR D=1 TO 2 STEP 0:IF I
NKEY$<>"" THEN D=2:NEXT D ELSE NEXT D
130 K=PEEK(15168)
140 IF K=8 THEN U=-1:H=0 ELSE IF K=16 THEN U=1:H=0 ELS
E IF K=32 THEN U=0:H=-1 ELSE IF K=64 THEN U=0:H=1
150 X=X+H:Y=Y+U:IF POINT(X,Y)=-1 THEN 190
160 PT=PEEK(15360+INT(X/2)+INT(Y/3)*64):IF PT<127 AND
PT>32 THEN SC=SC+1:BL=BL+1:PRINT@7,SC;
170 SET(X,Y):IF BL<S THEN 130
180 CLS:PRINT "LEVEL";S;"COMPLETED ... BONUS:";S*5:SC=
SC+S*5:BL=0:S=S+1:FOR D=1 TO 1000:NEXT D:GOTO 60
190 FOR X=1 TO 200:PRINT CHR$(23);CHR$(28);:NEXT X:CLS
:PRINT "YOU MADE IT TO LEVEL";S;"WITH A SCORE OF";SC:I
NPUT "WOULD YOU LIKE TO PLAY AGAIN (Y/N)";A$:IF LEFT$(
A$,1)="Y" THEN 50
```

TIMEX SINCLAIR/*MICROWORLD*

1000 or 1500 • 2K RAM

```
10 DIM E$(3)
20 LET S$=CHR$ 0+CHR$ 9+CHR$ 8+CHR$ 9
30 REM **T$ IS THE TITLE.
40 REM **IT CAN BE CHANGED.
```

```
50 LET T$="MICROWORLD"
60 FAST
70 RAND
80 FOR M=0 TO 60
90 FOR N=0 TO INT (RND*40)+1
100 PLOT M,N
110 NEXT N
120 NEXT M
130 SLOW
140 PRINT AT 21,15-(LEN T$/2);
150 FOR N=1 TO LEN T$
160 PRINT CHR$ (CODE T$(N)+128)
170 NEXT N
180 FOR N=1 TO 28
190 PRINT AT 0,N;S$
200 NEXT N
210 PRINT AT 0,29;E$
220 GOTO 180
```

TIMEX SINCLAIR/*SPACESCAPE*

1000 or 1500 • 2K RAM

```
10 DIM S$(32)
20 SLOW
30 FOR N=1 TO 32
40 LET S$(N)=CHR$ 128
50 NEXT N
60 SCROLL
70 PRINT S$;AT 21,RND*31;CHR$ 155
80 GOTO 60
```

APPLE/*BLACK HOLE*

II plus or IIe • 32K RAM • color TV or monitor optional

```
10 HGR2
20 FOR I=0 TO 279:HCOLOR=INT(RND(1)*7)+1:HPLOT I,0 TO
279-I,191:HPLOT 279,I*191/279 TO 0,191-I*191/279:NEXT
I
30 HCOLOR=0:FOR I=0 TO 95:HPLOT 140+I,95-I TO 140-I,95
-I TO 140-I,96+I TO 140+I,96+I TO 140+I,95-I:NEXT I
40 FOR I=0 TO 45:HPLOT 45-I,0 TO 45-I,191:HPLOT 234+I,
0 TO 234+I 191:NEXT I:GOTO 20
```

ATARI/*BLACK HOLE*

400, 600XL, 800, or 800XL • 16K RAM • color TV or monitor optional

```
10 GRAPHICS 7+16
20 FOR I=0 TO 159:COLOR INT(RND(0)*3)+1:PLOT I,0:DRAWT
O 159-I,94:PLOT 159,I*94/159:DRAWTO 0,94-I*94/159:NEXT
 I
30 COLOR 0:FOR I=0 TO 47:PLOT 79+I,47-I:DRAWTO 79-I,47
-I:DRAWTO 79-I,47+I:DRAWTO 79+I,47+I:DRAWTO 79+I,47-I:
NEXT I
40 FOR I=0 TO 32:PLOT 32-I,0:DRAWTO 32-I,95:PLOT 127+I
,0:DRAWTO 127+I,95:NEXT I:GOTO 20
```

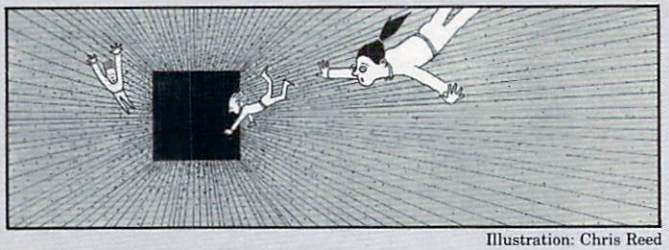


Illustration: Chris Reed

COLECO/*BLACK HOLE*

ADAM • 80K RAM • color TV or monitor optional

```
10 HGR2
20 FOR i=0 TO 255:HCOLOR=INT(RND(1)*7)+1:HPLOT i,0 TO
255-i,191:HPLOT 255,i*191/255 TO 0,191-i*191/255:NEXT
i
30 HCOLOR=0:FOR i=0 TO 95:HPLOT 127+i,95-i TO 127-i,95
-i TO 127-i,96+i TO 127+i,96+i TO 127+i,95-i:NEXT i
40 FOR i=0 TO 24:HPLOT 24-i,0 TO 24-i,191:HPLOT 231+i,
0 TO 231+i,191:NEXT i:GOTO 20
```

IBM/*BLACK HOLE*

PC or PCjr • 64K RAM • color TV or monitor optional

```
10 KEY OFF:SCREEN 0,0:CLS:RANDOMIZE:SCREEN 1,0:COLOR 0
,1
20 FOR I = 0 TO 319:C = INT(RND*3)+1:LINE (I,0) - (319
-I,199),C:LINE (319,I*199/319) - (0,199-I*199/319),C:N
EXT I
30 FOR I = 0 TO 160:LINE (160+I,100-I) - (160-I,100+I)
,0,BF:NEXT I:GOTO 20
```

APPLE/*CRYSTAL MAKER*

II plus or IIe • 32K RAM • color TV or monitor optional

```
20 POKE -16368,0:HGR2:C=2:Y=2*RND(1)-1:Z=2*RND(1)-1:A=
RND(1)*280:AA=A:B=RND(1)*192:BB=B:IF ABS(Y*Z)<.15 THEN
20
30 HCOLOR=C:C=5-C
40 IF ((280*(Y>0))-AA)/Y>((192*(Z>0))-BB)/Z THEN 60
50 FOR X=AA TO (280*(Y>0))-5*Y STEP Y:AA=X:BB=BB+Z:HPL
OT A,B TO AA,BB:IF PEEK(-16384)=160 THEN 20
60 NEXT X:Y=-Y:GOTO 30
70 FOR X=BB TO (192*(Z>0))-5*Z STEP Z:BB=X:AA=AA+Y:HPL
OLT A,B TO AA,BB:IF PEEK(-16384)=160 THEN 20
80 NEXT X:Z=-Z:GOTO 30
```

ATARI/*CRYSTAL MAKER*

400, 600XL, 800, or 800XL • 16K RAM • color TV or monitor optional

```
20 GRAPHICS 23:C=2:Y=2*RND(0)-1:Z=2*RND(0)-1:A=INT(RND
(0)*160):AA=A:B=INT(RND(0)*95):BB=B:IF ABS(Y*Z)<0.15 T
HEN 20
```

```
30 COLOR C:C=5-C
40 IF ((159*(Y>0))-AA)/Y>((95*(Z>0))-BB)/Z THEN 70
50 FOR X=AA TO (159*(Y>0))-5*Y STEP Y:AA=X:BB=BB+Z:PLO
T A,B:DRAWTO AA,BB:IF PEEK(764)=33 THEN POKE 764,255:G
OTO 20
60 NEXT X:Y=-Y:GOTO 30
70 FOR X=BB TO (95*(Z>0))-5*Z STEP Z:BB=X:AA=AA+Y:PLOT
 A,B:DRAWTO AA,BB:IF PEEK(764)=33 THEN POKE 764,255:GO
TO 20
80 NEXT X:Z=-Z:GOTO 30
```

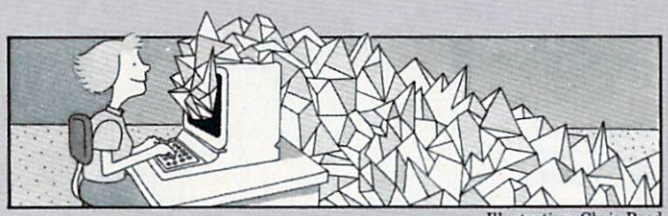


Illustration: Chris Reed

COLECO/*CRYSTAL MAKER*

ADAM • 80K RAM • color TV or monitor optional

```
20 k=PEEK(64885):HGR2:c=1:y=2*RND(1)-1:z=2*RND(1)-1:a=
RND(1)*256:aa=a:b=RND(1)*192:bb=b:IF ABS(y*z)<.15 THEN
 20
30 HCOLOR=c:c=6-c
40 IF ((256*(y>0))-aa)/y>((192*(z>0))-bb)/z THEN 70
50 FOR x=aa TO (254*(y>0))-5*y STEP y:aa=x:bb=bb+z:HPL
OT a,b TO aa,bb:m=PEEK(64885):IF k<>m THEN k=m:GOTO 20
60 NEXT x:y=-y:GOTO 30
70 FOR x=bb TO (192*(z>0))-5*z STEP z:bb=x:aa=aa+y:HPL
OT a,b TO aa,bb:m=PEEK(64885):IF k<>m THEN k=m:GOTO 20
80 NEXT x:z=-z:GOTO 30
```

IBM/*CRYSTAL MAKER*

PC or PCjr • 64K RAM • color TV or monitor optional

```
10 RANDOMIZE:KEY OFF:SCREEN 1,0:COLOR 0,1
20 CLS:C=3:Y = 2*RND-1:Z = 2*RND-1:A = RND*320:AA = A:
B = RND*200:BB = B:IF ABS(Y*Z) < .15 THEN 20
30 C = 5-C
40 IF ((-320*(Y>0))-AA)/Y>((-200*(Z>0))-BB)/Z THEN 70
50 FOR X = AA TO (-320*(Y>0))-5*Y STEP Y:AA = X:BB = B
B+Z:LINE (A,B) - (AA,BB),C:A$ = INKEY$:IF A$ = " " THE
N 20
60 NEXT X:Y = -Y:GOTO 30
70 FOR X = BB TO (-200*(Z>0))-5*Z STEP Z:BB = X:AA = A
A+Y:LINE (A,B) - (AA,BB),C:A$ = INKEY$:IF A$ = " " THE
N 20
80 NEXT X:Z = -Z:GOTO 30
```

RADIO SHACK/*CRYSTAL MAKER*

TRS-80 Color Computer • 16K RAM • color TV optional • Extended Color BASIC

```
10 PMODE 3,1:SCREEN 1,0:COLOR 4,2
20 PCLS:C=3:Y=2*RND(0)-1:Z=2*RND(0)-1:A=RND(0)*256:AA=
A:B=RND(0)*192:BB=B:IF ABS(Y*Z)<.15 THEN 20
30 COLOR C:C=7-C
40 IF ((-256*(Y>0))-AA)/Y>((-192*(Z>0))-BB)/Z THEN 70
50 FOR X=AA TO (-256*(Y>0))-5*Y STEP Y:AA=X:BB=BB+Z:LI
NE (A,B) - (AA,BB),PSET:A$=INKEY$:IF A$<>"" THEN 20
60 NEXT X:Y=-Y:GOTO 30
70 FOR X=BB TO (-192*(Z>0))-5*Z STEP Z:BB=X:AA=AA+Y:LI
NE (A,B) - (AA,BB),PSET:A$=INKEY$:IF A$<>"" THEN 20
80 NEXT X:Z=-Z:GOTO 30
```


Flash and *Scroller*

By Rich Uhlig

So, you want to make your screen displays flash, huh? And you want to make them scroll, too? Well, have no fear, *Flash* and *Scroller* are here! The first subroutine, *Flash*, lets you blink and blaze just about any picture you can put together. Take out the *Flash* subroutine, insert *Scroller*, and you can move a display across the screen, out one side, and back in the other. If you want, you can even combine the two (with a little modification of the BASIC program).

The *Flash* and *Scroller* subroutines are written in machine code. *Flash* performs what's called a "flip" on a high-res picture, changing each byte of screen RAM to its complement so that what was light turns dark and vice versa. *Scroller* moves the bytes of a high-res picture through screen RAM so that the image appears to scroll sideways.

To demonstrate these subroutines, I've included the short BASIC program below. The program sets up high-res graphics, draws a test picture, and places the machine code for one of the subroutines (contained in DATA statements) in memory. The subroutine can then be executed by pressing any key. To change one subroutine for the other, just change the DATA statements at line 1000.

RICH UHLIG, *17, is an instructor at CP & YOU, a computer learning center in his hometown of Toledo, Ohio.*

Assembly-Language Secrets Revealed

You can type in the BASIC program for *Flash* or *Scroller* and it'll work just fine. But where did all those numbers in the DATA statements come from?

The subroutines that actually do the scrolling and the flashing are written in machine language. Line 10 reads them from the DATA statements and POKEs them directly into memory. Then the CALL in line 100 of the Apple version (the USR call in line 90 of the Atari) tells the BASIC program to jump to the machine-language subroutine and execute it.

But, you may wonder, how did I figure out those numbers in the first place? Well, first I wrote the subroutines in assembly language. Then I assembled them and translated the hex codes my assembler gave me into decimal numbers, one per byte, that I could put into BASIC DATA statements.

Here is the source code for the subroutines, with the assembled version shown in hex at the left. If you know hex, that'll show you exactly where the numbers in those strange DATA statements came from. And if you know assembly language, I hope you can use these subroutines in larger assembly-language programs you write.

APPLE/*SCROLLER*

II plus or IIe • 32K RAM • any Apple assembler

```
0000    = 0300          ORG 768
        = 0000 HIRES    EQU 0           ;ZERO PAGE
                                        ; STORAGE
                                        ;
0300  A900    START     LDA #0          ;ZERO LOW BYTE
0302  8500              STA HIRES       ; OF SCREEN PTR.
0304  A920              LDA #32         ;SET HIGH BYTE OF
0306  8501              STA HIRES+1     ; SCREEN PTR.
0308  A000    LOOP1     LDY #0          ;ZERO INDEX
030A  B100              LDA (HIRES),Y   ;GET LEFT BYTE
030C  AA                TAX             ;STORE IN X
030D  C8      LOOP2     INY             ;INCREMENT INDEX
030E  B100              LDA (HIRES),Y   ;MOVE NEXT BYTE
0310  88                DEY             ; ONE POSITION TO
0311  9100              STA (HIRES),Y   ; THE LEFT
0313  C8                INY             ;INCREMENT INDEX
0314  C027              CPY #39         ;END OF LINE?
0316  D0F5              BNE LOOP2       ;IF NOT, GET
                                        ; NEXT BYTE
0318  8A                TXA             ; ELSE PLACE
0319  9100              STA (HIRES),Y   ; LEFTMOST BYTE
                                        ; AT FAR RIGHT
031B  A500              LDA HIRES
031D  C950              CMP #80         ;IS THIS AN
031F  F004              BEQ ADD         ; UNUSED PORTION
0321  C9D0              CMP #208        ; OF SCREEN RAM?
0323  D006              BNE SKIP1
0325  18      ADD       CLC             ;SKIP OVER UNUSED
0326  6930              ADC #48         ; PORTION
0328  4C2E03            JMP SKIP2
032B  18      SKIP1     CLC             ;ELSE ADD 40
032C  6928              ADC #40         ; TO POINTER
032E  8500    SKIP2     STA HIRES
0330  A501              LDA HIRES+1
0332  6900              ADC #0
0334  8501              STA HIRES+1
0336  C940              CMP #64         ;END OF SCREEN?
0338  D0CE              BNE LOOP1       ;IF NOT, REPEAT
033A  60                RTS             ; ELSE EXIT
```

ATARI/*SCROLLER*

400, 600XL, 800, or 800XL • 16K RAM • any compatible Atari assembler

```
0000    = 0600          ORG 1536
        = 00CB HIRES    EQU 203         ;ZERO PAGE
        = 00CD LINES    EQU 205         ; STORAGE
        = 0058 SCPTR    EQU 88          ;SCREEN RAM POINTER
0600  68      START     PLA             ;CLEAR STACK
0601  A960              LDA #96         ;GET NUMBER
                                        ; OF DISPLAY
                                        ; LINES IN GR.7
0603  85CD              STA LINES       ; AND STORE
0605  A558              LDA SCPTR       ;GET START ADDRESS
0607  85CB              STA HIRES       ; OF SCREEN RAM
0609  A559              LDA SCPTR+1     ; AND STORE
060B  85CC              STA HIRES+1
060D  A000    LOOP1     LDY #0          ;ZERO LOOP COUNT
060F  B1CB              LDA (HIRES),Y   ;GET LEFT BYTE
0611  AA                TAX             ;STORE IN X
0612  C8      LOOP2     INY             ;INCREMENT INDEX
0613  B1CB              LDA (HIRES),Y   ;MOVE NEXT BYTE
0615  88                DEY             ; ONE POSITION TO
0616  91CB              STA (HIRES),Y   ; THE LEFT
0618  C8                INY             ;INCREMENT INDEX
0619  C027              CPY #39         ;END OF LINE?
061B  D0F5              BNE LOOP2       ;IF NOT, GET
                                        ; NEXT BYTE
061D  8A                TXA             ; ELSE PLACE
061E  91CB              STA (HIRES),Y   ; LEFTMOST BYTE
                                        ; AT FAR RIGHT
0620  C6CD              DEC LINES       ;LINE IS FINISHED
0622  F00F              BEQ EXIT        ;IF NO MORE
                                        ; LINES THEN EXIT
0624  A5CB              LDA HIRES       ; ELSE ADD 40
0626  18                CLC             ; TO POINTER
0627  6928              ADC #40         ; AND REPEAT
0629  85CB              STA HIRES
062B  A5CC              LDA HIRES+1
062D  6900              ADC #0
062F  85CC              STA HIRES+1
```

```
0631  DODA          BNE LOOP1
0633  60      EXIT  RTS
```

APPLE/*FLASH*

II plus or IIe • 32K RAM • any Apple assembler

```
0000    = 0300          ORG 768
        = 0000 SCRAM    EQU 0           ;ZERO PAGE
        = 0002 PAGES    EQU 2           ; STORAGE
        = 0028 NOPGS    EQU 40          ;HGR RAM SIZE
                                        ;
0300  A928      START   LDA #NOPGS      ;STORE SIZE OF
0302  8502              STA PAGES       ; SCREEN RAM
0304  A900              LDA #0          ;ZERO LOW BYTE
0306  8500              STA SCRAM       ; OF POINTER
0308  A920              LDA #32         ;SET HIGH BYTE
030A  8501              STA SCRAM+1     ; TO POINT TO
                                        ; SCREEN RAM
030C  A000              LDY #0          ;CLEAR INDEX
030E  B100      LOOP    LDA (SCRAM),Y   ;GET A BYTE
0310  49FF              EOR #255        ;COMPLEMENT IT
0312  9100              STA (SCRAM),Y   ;PUT IT BACK
0314  C8                INY             ;INCREMENT INDEX
0315  D0F7              BNE LOOP        ;DO ANOTHER BYTE
0317  C602              DEC PAGES       ;PAGE IS DONE
0319  F004              BEQ EXIT        ;MORE TO DO?
031B  E601              INC SCRAM+1     ;DO ANOTHER
031D  D0EF              BNE LOOP        ; PAGE
031F  60        EXIT    RTS             ; ELSE EXIT
```

ATARI/*FLASH*

400, 600XL, 800, or 800XL • 16K RAM • any compatible Atari assembler

```
0000    = 0600          ORG 1536
        = 00CB SCRAM    EQU 203         ;ZERO PAGE
        = 00CD PAGES    EQU 205         ; STORAGE
        = 000F NOPGS    EQU 15          ;GR.7 RAM SIZE
        = 0058 SCPTR    EQU 88          ;POINTER TO
                                        ; SCREEN RAM
                                        ;
0600  68        START   PLA             ;CLEAR STACK
0601  A90F              LDA #NOPGS      ;STORE RAM SIZE
0603  85CD              STA PAGES       ; TO FLASH
0605  A558              LDA SCPTR       ;GET POINTER
0607  85CB              STA SCRAM       ; TO SCREEN RAM
0609  A559              LDA SCPTR+1     ; AND STORE
060B  85CC              STA SCRAM+1
060D  A000              LDY #0          ;SET INDEX
060F  B1CB      LOOP    LDA (SCRAM),Y   ;GET BYTE
0611  49FF              EOR #255        ;COMPLEMENT IT
0613  91CB              STA (SCRAM),Y   ;PUT IT BACK
0615  C8                INY             ;INCREMENT INDEX
0616  D0F7              BNE LOOP        ;DO ANOTHER BYTE
0618  C6CD              DEC PAGES       ;PAGE IS DONE
061A  F004              BEQ EXIT        ;MORE TO DO?
061C  E6CC              INC SCRAM+1     ;DO ANOTHER
061E  D0EF              BNE LOOP        ; PAGE
0620  60        EXIT    RTS
```

APPLE/*FLASH* AND *SCROLLER*

II plus or IIe • 32K RAM • color TV or monitor optional

```
10 READ BYTES:FOR X = 0 TO BYTES:READ A:POKE 768 + X,A
:NEXT X
20 REM LINES 30 TO 90 DRAW A HI-RES PICTURE. YOU CAN S
UBSTITUTE YOUR OWN.
30 HGR
40 POKE -16304,0:POKE -16302,0:POKE -16297,0
50 WIDTH = 279:DEPTH = 191:HCOLOR= 3
60 FOR C = 1 TO 50
70 X = INT(RND(1) * WIDTH):Y = INT(RND(1) * DEPTH)
80 Q = WIDTH - X:R = DEPTH - Y:Z = INT(RND(1) * (Q + (
Q > R) * (R - Q))) + 1:IF Z / 2 <> INT(Z / 2) THEN 70
90 FOR I = X TO X + Z STEP 2:HPLOT I,Y:NEXT I:FOR I =
Y TO Y + Z:HPLOT X + Z,I:NEXT I:FOR I = X + Z TO X STE
P -2:HPLOT I,Y + Z:NEXT I:FOR I = Y + Z TO Y STEP -1:H
PLOT X,I:NEXT I:NEXT C
100 GET A$:CALL 768:GOTO 100
1000 REM DATA FOR FLASH
1010 DATA 31,169,40,133,2,169,0,133,0
1020 DATA 169,32,133,1,160,0
1030 DATA 177,0,73,255,145,0
1040 DATA 200,208,247,198,2,240
1050 DATA 4,230,1,208,239,96
```

The listing above is for Apple *Flash*. To run Apple *Scroller* instead, just substitute the following DATA statements for lines 1000–1050

```
1000 REM DATA FOR SCROLLER
1010 DATA 58,169,0,133,0,169,32
1020 DATA 133,1,160,0,177,0
1030 DATA 170,200,177,0,136,145
1040 DATA 0,200,192,39,208,245
1050 DATA 138,145,0,165,0,201
1060 DATA 80,240,4,201,208,208
1070 DATA 6,24,105,48,76,46
1080 DATA 3,24,105,40,133,0
1090 DATA 165,1,105,0,133,1
1100 DATA 201,64,208,206,96
```

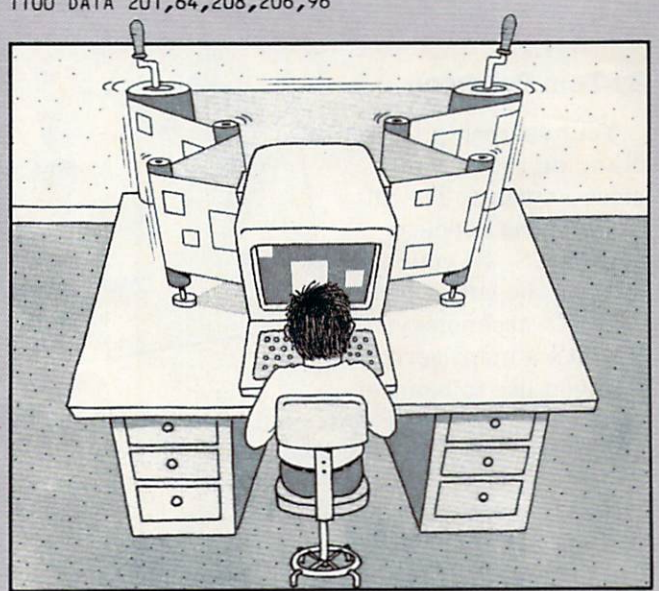


Illustration: Chris Reed

ATARI/*FLASH* AND *SCROLLER*

400, 600XL, 800, or 800XL • 16K RAM • color TV or monitor optional

```
10 READ BYTES:FOR X=0 TO BYTES:READ A:POKE 1536+X,A:NE
XT X
20 REM LINES 30 TO 70 DRAW A HI-RES PICTURE; YOU CAN S
UBSTITUTE YOUR OWN
30 GRAPHICS 7+16:WIDTH=159:DEPTH=95
40 FOR C=1 TO 50
50 COLOR INT(RND(0)*3)+1:X=INT(RND(0)*WIDTH):Y=INT(RND
(0)*DEPTH)
60 Q=WIDTH-X:R=DEPTH-Y:Z=INT(RND(0)*(Q+(Q>R)*(R-Q)))+1
70 PLOT X,Y:DRAWTO X+Z,Y:DRAWTO X+Z,Y+Z:DRAWTO X,Y+Z:D
RAWTO X,Y:NEXT C
80 K=PEEK(764):IF K=255 THEN 80
90 POKE 764,255:X=USR(1536):GOTO 80
1000 REM DATA FOR FLASH
1010 DATA 32,104,169,15,133,205,165,88
1020 DATA 133,203,165,89,133,204,160
1030 DATA 0,177,203,73,255,145,203
1040 DATA 200,208,247,198,205,240
1050 DATA 4,230,204,208,239,96
```

The listing above is for Atari *Flash*. To run Atari *Scroller* instead, just substitute the following DATA statements for lines 1000-1050:

```
1000 REM DATA FOR SCROLLER
1010 DATA 51,104,169,96,133,205,165
1020 DATA 88,133,203,165,89,133
1030 DATA 204,160,0,177,203,170
1040 DATA 200,177,203,136,145,203
1050 DATA 200,192,39,208,245,138
1060 DATA 145,203,198,205,240,15
1070 DATA 165,203,24,105,40,133
1080 DATA 203,165,204,105,0,133
1090 DATA 204,208,218,96
```

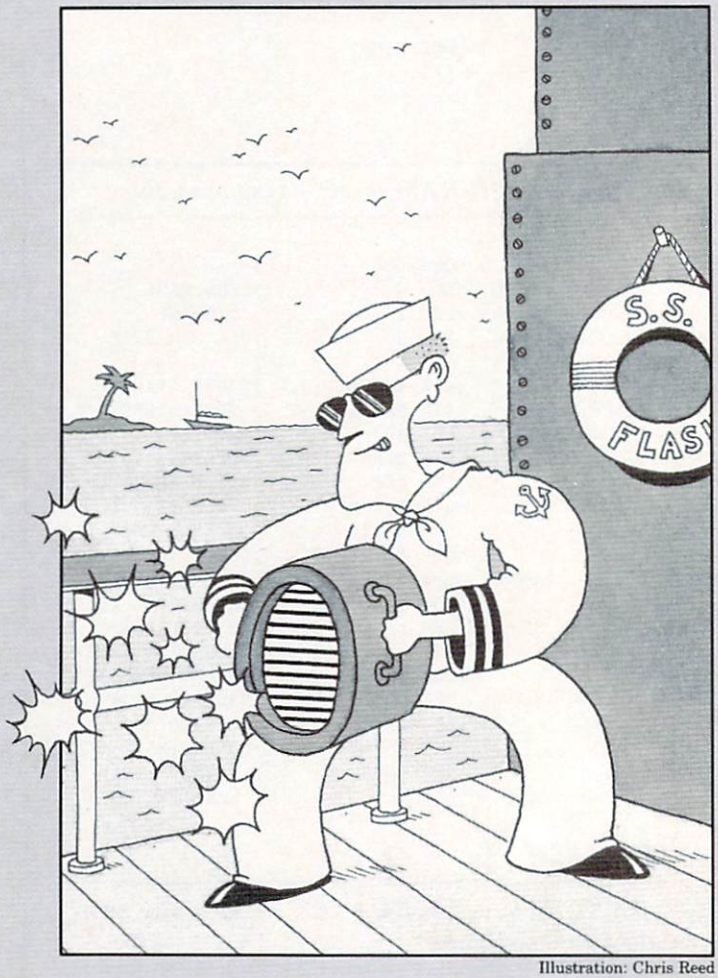


Illustration: Chris Reed

Lunar Kangaroo

By Tom Peterson

Your spaceship is plunging toward the moon's surface. The situation seems hopeless. But—look!—at your disposal is the cutting edge of NASA technology. Yes, it's a giant spring that you use to bounce back into orbit. Steer your craft steadily and you might just save your own hide.

TOM PETERSON, *14, is living proof that hackers thrive in every corner of the U.S. He lives in Vancouver, Washington, and is part of* K-POWER's K-NET.

There seems to be no time like the present to start on a career as an astronaut. It's time to *spring* into action! After a few rounds of this you should be ready to pilot your own space shuttle. It isn't easy, though. Like they say, to tackle this you'll need the "right stuff."

APPLE/*LUNAR KANGAROO*

II plus or IIe • 32K RAM

```
10 FOR X = 0 TO 141:READ Y:POKE 768 + X,Y:NEXT X
20 POKE 232,0:POKE 233,3:HC = -1
30 SCALE= 1:ROT= 0
40 TEXT:HOME:VTAB 4:HTAB 4:PRINT "DIFFICULTY LEVELS: 1
-CADET":HTAB 23:PRINT "2-AVENGER"
50 HTAB 23:PRINT "3-CAPTAIN":HTAB 23:PRINT "4-COMMANDE
R"
60 VTAB 10:INPUT "  LEVEL OF DIFFICULTY?";DL
70 IF DL < 1 OR DL > 4 THEN 60
```

```
80 VTAB 13:HTAB 5:INPUT "NUMBER OF BOUNCES?";NB
90 HOME:VTAB 21:PRINT "MISSES: 0":PRINT "BOUNCES: 0"
100 HGR:HCOLOR= 3:SX = 138:BX = 138:BC = 0:MC = 0
110 BY = 10:YS = 2:IF BC + MC = NB THEN 250
120 DRAW 3 AT SX,150:DRAW 2 AT BX,BY
130 K = PEEK(-16384):POKE -16368,0:SO = 0
140 IF K = 149 THEN SO = 4
150 IF K = 136 THEN SO = -4
160 XDRAW 2 AT BX,BY:BX = BX + SO:BY = BY + YS:IF BY >
 191 THEN BY = 10
170 IF BX < 1 THEN BX = 278
180 IF BX > 278 THEN BX = 1
190 XDRAW 2 AT BX,BY
200 GOSUB 2000
210 IF BY < 138 THEN 130
220 IF BY < 140 AND ABS(BX - SX) < 14 THEN GOSUB 1000:
GOTO 110
230 IF BY < 170 THEN 130
240 PRINT CHR$(7);:MC = MC + 1:VTAB 21:PRINT "MISSES:
";MC:GOTO 110
250 TEXT:HOME:VTAB 5:PRINT "GAME STATISTICS: "
260 PC = INT((BC * 100) / NB)
270 PRINT:PRINT "NUMBER OF BOUNCES: ";NB:PRINT "PERCEN
TAGE HIT:  ";PC"%":PRINT "PERCENTAGE MISSED: ";100 - P
C;"%"
280 VTAB 12:IF PC < HP THEN 310
290 PRINT "YOU HAVE RATED AS TOP PERCENTAGE SCORER."
300 INPUT "ENTER YOUR NAME: ";HS$:HP = PC
310 VTAB 12:CALL -868
320 PRINT "CURRENT HIGHEST PERCENTAGE: ";HP;"%"
330 PRINT :CALL -868:HTAB 19:PRINT "BY":PRINT
340 HTAB 18 - LEN(HS$) / 2:PRINT "* ";HS$;" *"
350 VTAB 21:PRINT "  PLAY AGAIN (Y/N)?";
360 GET A$:IF A$ = "Y" THEN 40
370 IF A$ <> "N" THEN 360
380 END
1000 PRINT CHR$(7);:BC = BC + 1:VTAB 22
1010 XDRAW 2 AT BX,BY:XDRAW 3 AT SX,150:BY = 143:XDRAW
 2 AT BX,BY:XDRAW 1 AT SX,150
1020 CALL 897
1030 XDRAW 1 AT SX,150:XDRAW 3 AT SX,150
1040 XDRAW 2 AT BX,BY:BY = 138:XDRAW 2 AT BX,BY
1050 XDRAW 2 AT BX,BY
1060 BX = BX + SQR((BY + 30) / 10) * SGN(SO):IF BX > 2
78 THEN BX = 0
1070 IF BX < 0 THEN BX = 278
1080 BY = BY - (BY / 30)   2 - 2
1090 XDRAW 2 AT BX,BY:GOSUB 2000
1100 IF BY > 9 THEN 1050
1110 PRINT CHR$(7);:XDRAW 2 AT BX,BY:PRINT "BOUNCES: "
;BC:RETURN
2000 XDRAW 3 AT SX,150
2010 SX = SX + SS:IF SX   278 THEN SX = 0
2020 IF RND(1) > 0.8 THEN SS = RND(1) * DL * 2
2030 XDRAW 3 AT SX,150:RETURN
3000 DATA 3,0,8,0,30,0,71,0,14,45,45,40,32
3010 DATA 228,63,63,23,14,45,45,32,8,36,28,63
3020 DATA 63,23,14,45,5,0,63,63,63,23,23,45,45,45
3030 DATA 45,45,45,45,45,28,28,63,63,63,32,36
3040 DATA 36,63,191,30,23,23,45,45,45,13,45,45
3050 DATA 45,28,28,28,28,63,7,0,45,45,45,96,228
3060 DATA 28,63,63,63,63,63,23,14,45,45,45,45
3070 DATA 45,5,8,36,28,28,63,63,63,63,63,23,14
3080 DATA 45,45,45,45,45,5,8,36,28,28,63,63,63
3090 DATA 63,63,23,14,45,45,45,45,45,5,8,5,0
4000 DATA 160,255,173,48,192,152,170,202,234
4010 DATA 208,252,136,208,244,96
```

ATARI/*LUNAR KANGAROO*

400, 600XL, 800, or 800XL • 16K RAM • color TV or monitor optional • joystick (port #1)

```
10 DIM T$(1):X=ADR(T$):BASE=INT((X-512)/1024+1)*1024:O
PEN #1,4,0,"K:"
20 DIM X$(BASE-X+511),PA$(128),PB$(128),SH$(45),SPA$(5
0),SPB$(50),BLK$(128),NAME$(255)
30 HA=53248:HB=53249:CA=704:CB=705
40 BLK$=CHR$(0):BLK$(128)=BLK$:BLK$(2)=BLK$
50 SH$=BLK$:FOR X=16 TO 30:READ T:SH$(X,X)=CHR$(T):NEX
T X
60 SPA$=BLK$:FOR X=20 TO 37:READ T:SPA$(X,X)=CHR$(T):N
EXT X
70 SPB$=BLK$:FOR X=27 TO 37:READ T:SPB$(X,X)=CHR$(T):N
EXT X
80 H=0:M=0:PB$=BLK$:GRAPHICS 17:SETCOLOR 0,12,12
90 PRINT #6;"1) CADET":PRINT #6;"2) AVENGER":PRINT #6;
"3) CAPTAIN":PRINT #6;"4) COMMANDER"
100 POSITION 0,6:PRINT #6;"SELECT DIFFICULTY:";:GET #1
,LVL:LVL=LVL-48:IF LVL<1 OR LVL>4 THEN 100
110 PRINT #6;LVL:T=1:PRINT #6;"NUMBER OF BOUNCES:";:X$
=""
120 GET #1,X:IF X>47 AND X<58 THEN X$(T)=CHR$(X):T=T+1
:PRINT #6;CHR$(X);
130 IF (X<>155 AND T<>4) OR X$="" THEN 120
140 NT=VAL(X$)
150 GRAPHICS 17:POKE 623,1:POKE 54279,BASE/256:POKE 55
9,46:POKE 53277,3:POKE 704,36:POKE 53256,0
160 SETCOLOR 4,4,4:SETCOLOR 0,12,12:PRINT #6;"MISSES:
":PRINT #6;"BOUNCES:"
170 VP=5:PA$=BLK$:HAP=100
180 HBP=50
190 POKE CA,90:POKE HA,HAP:PA$(VP)=SH$:POKE CB,251:POK
E HB,HBP:PB$(80)=SPA$:POKE 53278,0
200 POSITION 8,0:PRINT #6;M:POSITION 8,1:PRINT #6;H:IF
 H+M=NT THEN 330
210 S=STICK(0):DR=0:IF S=7 THEN HAP=HAP+1:DR=1:IF HAP>
208 THEN HAP=40
220 IF S=11 THEN HAP=HAP-1:DR=-1:IF HAP<40 THEN HAP=20
8
230 HBP=HBP+(RND(0)*LVL)+(-164*(HBP>208)):POKE HB,HBP
240 IF VP>90 THEN SOUND 0,170,6,14:M=M+1:FOR D=1 TO 75
:NEXT D:SOUND 0,0,0,0:PA$=BLK$:GOTO 170
250 VP=VP+0.5:PA$(VP)=SH$:POKE HA,HAP
260 IF  NOT PEEK(53260) THEN 210
270 IF VP>75 THEN 210
280 T=0:FOR V=10 TO 0 STEP -0.3:T=T+2:PB$(80)=SPB$:FOR
 P=3 TO 10:SOUND 0,P,10,V:NEXT P
290 HAP=HAP+(T*DR)/35:IF HAP>220 THEN HAP=220
300 IF HAP<30 THEN HAP=30
310 POKE HA,HAP:PA$(VP-T)=SH$:PB$(80)=SPA$
320 FOR P=14 TO 26 STEP 12:SOUND 1,P,10,V:NEXT P:NEXT
V:PB$(80)=SPA$:H=H+1:VP=VP-T:GOTO 170
330 PA$=BLK$:PB$=BLK$:GMHP=INT((H/NT)*100):POSITION 0,
0:PRINT #6;BLK$
340 POSITION 0,0:PRINT #6;"GAME STATISTICS: ":PRINT #6
:PRINT #6;"NUMBER OF BOUNCES: ";NT
350 PRINT #6;"PERCENTAGE HIT: ";GMHP;"%":PRINT #6;"PER
CENT MISSED: ";100-GMHP;"%"
360 FOR T=80 TO 180 STEP 6:R=INT(RND(0)*15):PB$(30+R)=
SPA$:FOR D=30 TO 45:SOUND 0,INT(D+T/10),10,10:NEXT D
370 PB$(30+R)=SPB$:FOR D=1 TO 60:NEXT D:POKE HB,T:NEXT
```

```
 T:SOUND 0,0,0,0
380 IF GMHP>=CHP THEN CHP=GMHP:POSITION 0,0:PRINT #6;B
LK$:GOTO 430
390 POSITION 0,14:PRINT #6;"CURRENT HIGHEST":PRINT #6;
"PERCENTAGE: ";CHP;"%":PRINT #6;NAME$
400 POSITION 0,20:PRINT #6;" PLAY AGAIN? (Y/N)":POKE H
A,0:POKE HB,0
410 GET #1,X:IF X=ASC("Y") THEN 80
420 GRAPHICS 0:END
430 PRINT #6;"YOU ARE RATED":PRINT #6;"THE TOP PERCENT
AGE":PRINT #6;"SCORER."
440 PRINT #6;"ENTER YOUR NAME:":NAME$=""
450 GET #1,X:IF X=155 THEN 390
460 NAME$(LEN(NAME$)+1)=CHR$(X):PRINT #6;CHR$(X);:GOTO
 450
1000 DATA 24,44,78,255,24,24,24,255,114,52,60,66,165
1010 DATA 153,129,31,32,64,134,73,49,63,64,128,70,41
1020 DATA 49,79,128,142,81,63,64,31,32,71,127,32,71
1030 DATA 127,32,7,127,32
```

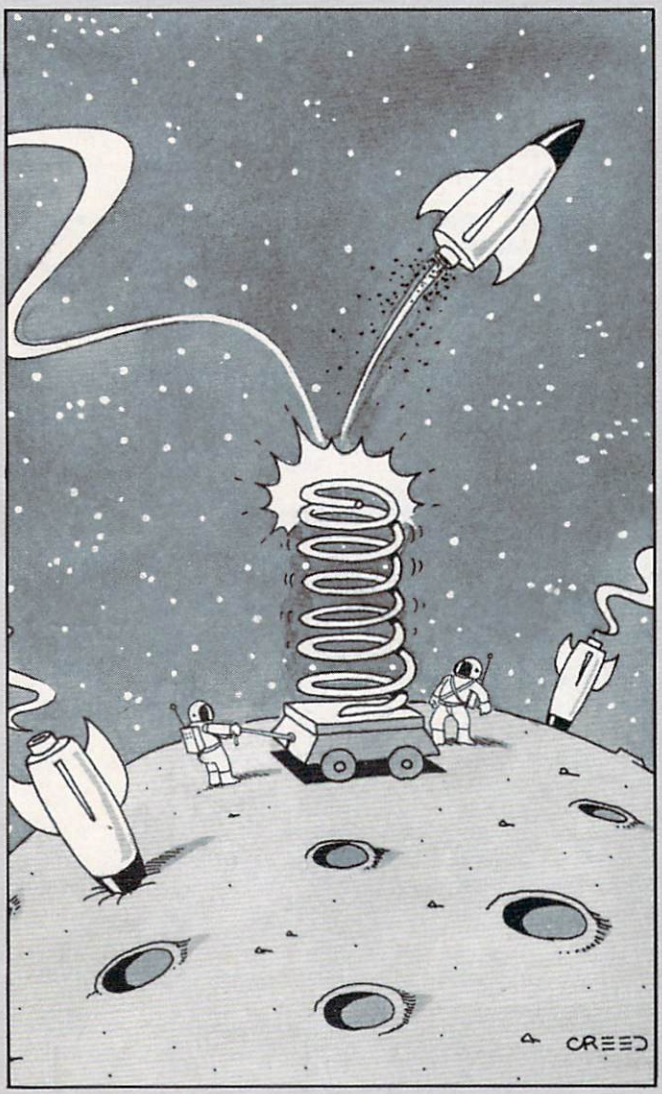


Illustration: Chris Reed

COMMODORE/*LUNAR KANGAROO*

Commodore 64 • joystick required (port #1)

```
10 CHP=0:POKE 649,1
20 PRINT CHR$(147):H=0:M=0:V=53248:POKE 53281,0:POKE V
+21,3:F1=0:F2=0
30 PRINT TAB(200) "1) CADET 2) AVENGER":PRINT:PRINT "3
) CAPTAIN 4) COMMANDER"
40 PRINT:INPUT "LEVEL OF DIFFICULTY:";LVL
50 IF LVL<1 OR LVL>4 THEN 40
60 PRINT:INPUT "NUMBER OF BOUNCES";NT
70 IF NT=0 THEN 60
80 PRINT CHR$(147)
90 POKE 2040,13:FOR N=0 TO 62:READ Q:POKE 832+N,Q:NEXT
 N
100 POKE 2041,14:FOR N=0 TO 62:READ Q:POKE 896+N,Q:NEX
T N
110 POKE 2042,15:FOR N=0 TO 62:READ Q:POKE 960+N,Q:NEX
T N
120 POKE V+29,7:POKE V+23,7
130 PRINT:PRINT "MISSES:":PRINT "BOUNCES:"
140 POKE V+0,155:POKE V+1,40:POKE V+39,1
150 POKE V+2,155:POKE V+3,213:POKE V+40,1
160 AX=PEEK(V+0):AY=PEEK(V+1):BX=PEEK(V+2):BY=PEEK(V+3
):Z=PEEK(V+30)
170 PRINT CHR$(19):PRINT TAB(48) M:PRINT TAB(8) H:IF H
+M=NT THEN 390
180 JV=PEEK(56321) AND 15
190 GET JUNK$:IF JUNK$ <> "" THEN 190
200 IF JV AND 4 THEN AX=AX+(2*LVL)
210 IF JV AND 8 THEN AX=AX-(2*LVL)
220 IF F1=0 AND AX<0 THEN POKE V+16,PEEK(V+16) OR 1:AX
=63:F1=1
230 IF AX>255 THEN POKE V+16,PEEK(V+16) OR 1:AX=1:F1=1
240 IF F1=1 AND AX>63 THEN POKE V+16,(PEEK(V+16) AND 2
54):AX=1:F1=0
250 IF F1=1 AND AX<0 THEN POKE V+16,(PEEK(V+16) AND 25
4):AX=255:F1=0
260 BX=BX+(RND(0)*(3*LVL))
270 IF BX>255 THEN POKE V+16,PEEK(V+16) OR 6:BX=1:F2=1
280 IF F2=1 AND BX>63 THEN POKE V+16,(PEEK(V+16) AND 2
49):BX=1:F2=0
290 AY=AY+LVL
300 IF AY>174 THEN M=M+1:HI=24:LO=63:GOSUB 1000:F1=0:P
OKE V+16,0:GOTO 140
310 POKE V+0,AX:POKE V+1,AY:POKE V+2,BX:POKE V+3,BY
320 IF (PEEK(V+30) AND 1) = 0 THEN 180
330 POKE V+21,(PEEK(V+21) AND 1) OR 5:POKE V+4,BX:POKE
 V+5,BY
340 HI=244:LO=103:GOSUB 1000
350 FOR Y=AY TO 40 STEP -LVL:POKE V+1,Y:POKE V+0,AX
360 IF Y<170 THEN POKE V+21,(PEEK(V+21) AND 1) OR 3
370 NEXT Y
380 H=H+1:GOTO 160
390 POKE V+21,0:PRINT CHR$(147):GMHP=((H/NT)*100):GMHP
=INT(GMHP)
400 PRINT TAB(240) "GAME STATISTICS:":PRINT:PRINT "NUM
BER OF BOUNCES:";NT
410 PRINT:PRINT
420 PRINT "PERCENTAGE HIT:";GMHP;"%"
430 PRINT "PERCENTAGE MISSED:";100-GMHP;"%"
440 POKE V+21,2
450 FOR X=0 TO 80:POKE V+2,X:POKE V+3,X*2:NEXT X
460 POKE V+21,(PEEK(V+21) AND 0) OR 4
470 POKE V+4,80:POKE V+5,160:FOR T=1 TO 10:NEXT T
```

```
480 POKE V+21,(PEEK(V+21) AND 0) OR 2
490 FOR X=80 TO 130:POKE V+2,X:POKE V+3,(PEEK(V+3)-2):
NEXT X
500 FOR X=1 TO 125
510 POKE V+2,130+X:POKE V+3,X+2
520 NEXT X
530 POKE V+21,(PEEK(V+21) AND 0) OR 4:POKE V+4,PEEK(V+
2):POKE V+5,PEEK(V+3)
540 POKE V+21,0:IF GMHP>=CHP THEN CHP=GMHP:GOTO 590
550 PRINT:PRINT "CURRENT HIGHEST":PRINT "PERCENTAGE:";
CHP;"% : ";NAM$
560 PRINT:INPUT "PLAY AGAIN (Y/N)";ANSWER$:IF ANSWER$=
"" THEN 560
570 IF ANSWER$="Y" THEN RESTORE:POKE V+16,0:GOTO 20
580 END
590 PRINT CHR$(19):FOR X=1 TO 16:PRINT TAB(40):NEXT X:
PRINT "YOU HAVE RATED AS"
600 PRINT"TOP PERCENTAGE SCORER. ENTER YOUR NAME:":INP
UT NAME$:GOTO 560
1000 POKE 54296,15:POKE 54277,128:POKE 54278,128
1010 POKE 54273,HI:POKE 54272,LO:POKE 54276,17:FOR T=1
 TO 250:NEXT
1020 POKE 54276,0:POKE 54277,0:POKE 54278,0:RETURN
2000 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,15,240,0,16
2010 DATA 248,0,32,244,0,127,254,0,3,192,0,3,192,0,3
2020 DATA 192,0,127,254,0,63,4,0,31,8,0,15,240,0,9,144
2030 DATA 0,17,136,0,63,252,0,65,130,0,195,195,0,0,240
2040 DATA 0,1,0,0,2,120,0,2,136,0,3,16,0,3,224,0,4,0,0
2050 DATA 4,120,0,4,136,0,3,16,0,3,224,0,4,0,0,4,120,0
2060 DATA 4,136,0,3,16,0,3,224,0,0,0,0,0,0,0,0,0,0,0,0
2070 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
2080 DATA 0,0,0,0,0,0,0,0,0,0,31,248,0,0,4,0,31,248,0,32
2090 DATA 0,0,31,248,0,0,4,0,31,248,0,0,0,0,0,0,0,0,0
2100 DATA 0,0,0,0,0,0,0
```

TEXAS INSTRUMENTS/*LUNAR KANGAROO*

TI-99/4A • 16K RAM • color TV or monitor optional • joystick • TI extended BASIC

```
10 CHP=0
20 CALL CLEAR :: H=0 :: M=0
30 DISPLAY AT(10,1):"1) CADET  2) AVENGER"
40 DISPLAY AT(11,2):"3) CAPTAIN  4) COMMANDER"
50 DISPLAY AT(13,1):"SELECT DIFFICULTY:"
60 ACCEPT AT(13,19)BEEP VALIDATE("1234")SIZE(1):LVL
70 DISPLAY AT(15,1):"NUMBER OF BOUNCES:"
80 ACCEPT AT(15,19)BEEP VALIDATE(DIGIT)SIZE(3):NT
90 IF NT=0 THEN 70
100 CALL CLEAR :: CALL MAGNIFY(3)
110 CALL CHAR(96,"0F10207F0303037F3F1F0F09113F41C3F0F8
FCFEC0C0C0FE0408F09088FC82C3")
120 CALL CHAR(120,"000102020303040404030304040403030F00
0788810E000788810E000788810E0")
130 CALL CHAR(124,"00000000000000000000F001F201F001F000
0000000000000000F804F800F804F8")
140 DISPLAY AT(2,1):"MISSES:  " :: DISPLAY AT(3,1):"BO
UNCES:"
150 CALL SPRITE(#1,96,5,20,100):: CALL SPRITE(#2,120,2
,160,100)
160 DISPLAY AT(2,9):M :: DISPLAY AT(3,9):H :: IF H+M=N
T THEN 260
170 CALL JOYST(1,X,Y)
180 CALL MOTION(#2,0,INT(RND*(8*LVL)))
190 CALL POSITION(#1,A,B)
200 IF A>170 THEN CALL SOUND(200,200,0):: CALL SOUND(2
00,110,0):: M=M+1 :: GOTO 150
210 CALL MOTION(#1,9,X*3.5)
220 CALL COINC(ALL,C):: IF C<>-1 THEN 170
230 CALL PATTERN(#2,124):: FOR T=45 TO 2 STEP -1.5
240 CALL MOTION(#1,-T,X*3.5):: CALL PATTERN(#2,120)::
NEXT T
250 H=H+1 :: CALL SOUND(150,400,0):: CALL SOUND(200,60
0,0):: GOTO 160
260 CALL DELSPRITE(ALL):: CALL CLEAR :: GMHP=INT((H/NT
)*100)
270 DISPLAY AT(8,1):"GAME STATISTICS:"
280 DISPLAY AT(10,1):"NUMBER OF BOUNCES:";NT
290 DISPLAY AT(11,1):"PERCENTAGE HIT:";GMHP;"%"
300 DISPLAY AT(12,1):"PERCENTAGE MISSED:";100-GMHP;"%"
310 CALL SPRITE(#2,120,2,90,8):: FOR SD=1 TO 3
320 CALL PATTERN(#2,120):: FOR T=-62 TO 46 STEP 4
330 CALL MOTION(#2,T,15):: NEXT T :: CALL PATTERN(#2,1
24)
340 CALL SOUND(-60,300,0):: CALL SOUND(-60,360,4):: NE
XT SD
350 CALL DELSPRITE(#2)
360 IF GMHP>=CHP THEN CHP=GMHP :: GOTO 410
370 DISPLAY AT(16,1):"CURRENT HIGHEST PERCENTAGE:";CHP
;"% : ";NAME$;RPT$(" ",20)
380 DISPLAY AT(20,1):"PLAY AGAIN? (Y/N)"
390 CALL KEY(2,K,S):: IF S=0 THEN 390
400 IF K=18 THEN 20 :: CALL CLEAR :: STOP
410 DISPLAY AT(16,1):"YOU HAVE RATED AS TOP"
420 DISPLAY AT(17,1):"PERCENTAGE SCORER. ENTER    YOUR
 NAME:"
430 ACCEPT AT(18,11)BEEP:NAME$ :: GOTO 370
```

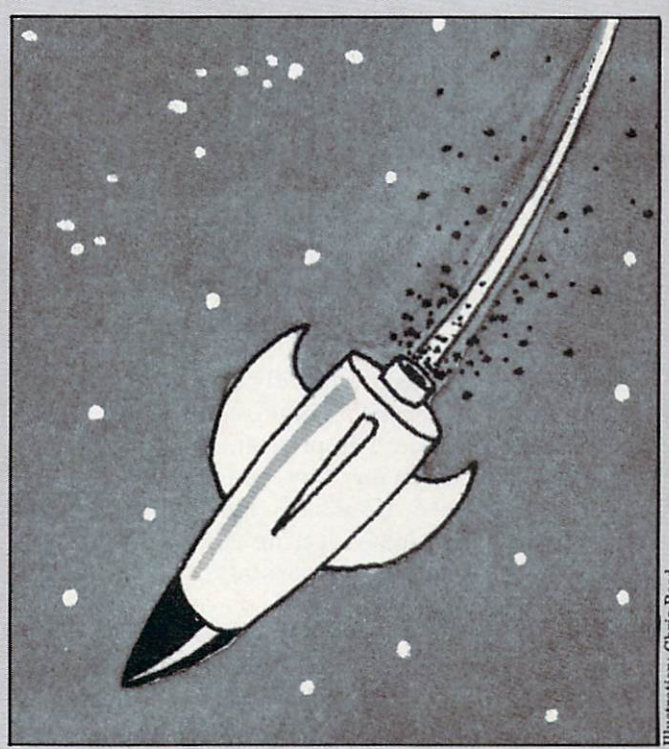
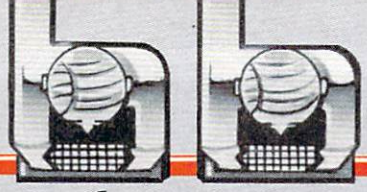


Illustration: Chris Reed



Manimation

Animation for the Timex

By Donald Guess, Jr.

If you've ever tried to do computer animation in BASIC by drawing an image on the screen, erasing it, then drawing a slightly different image in its place, you know the results aren't great.

Even the most lightning-fast interpreted BASIC can't draw and erase a series of pictures fast enough to look like smooth motion. (The speed needed can range from 15–30 draws per second.) Superfast machine-code drawing routines (Apple shape-table graphics, for example) also can't move fast enough. But there are several ways to do computer animation effectively, even with BASIC. All of these methods use hardware functions to rapidly alter preformed images on the computer screen. This way, you don't have to draw each image separately while the animation is in progress.

Using character graphics—graphics that use the character set and display functions of your computer and BASIC—is one way to do it. This month's Pixel That! shows several techniques for doing character graphics animation on the new Timex 2068 computer. But even if you don't own a TS 2068, you can adapt the techniques shown here for your computer.

The first program, *Big Flap*, shows how you can do simple animation using the 2068's built-in graphics characters, plus a little string manipulation. A character array is dimensioned to contain 130 rows of five characters each. This array is then divided into 26 "frames" that are each five rows deep by five characters wide. Graphics characters are placed in these frames to look like a bat in flight.

When these frames are rapidly printed on top of each other in the same location (see lines 90–110), the effect is dramatic. The program is designed so that if you hold down any key, you can see the animation at full speed. Hands off the keyboard makes things move more slowly, letting you see each "frame" of the animation separately.

Built-in block graphics let you do some nice tricks, but they limit the amount of detail you can put in the things you animate. The 2068 offers a way around this by letting you define new character forms. This is done by bit-mapping, discussed in Pixel That! in the February 1984 issue (*see "Roving Cupid," p. 48*). Bit-mapped characters are actually tiny, fully formed pictures made up of zeros and ones of a series of binary bytes.

In the 2068, graphics characters "A–U" can be customized. Bitmaps for these characters (eight bytes per character) are contained in RAM at the address stored at system variable UDG at 23675 decimal.

Redefining graphic characters by POKEing new values into their bitmaps lets you create a small library of custom shapes. These can be displayed almost immediately in any location by a simple PRINT statement.

The second example program, *Manimate*, defines characters "A–T" in one graphic character set as successive portions of a picture of a man walking downstairs. It defines these same characters in another character set to create a man walking to the right. By PRINTing the first set of these characters to the screen in the proper position (by the string manipulation technique demonstrated in *Big Flap*), the picture of a man walking downstairs comes to life.

Then, by suddenly switching from one character set to the other (POKEing the address of the second alternative character set to the system variable UDG), the image library is instantly shifted, and a very similar code is used to animate the man walking to the right of the screen. The program is set up so you can see the animation at full speed by holding down any key. But slow it down for observation by letting up on the keyboard.

DONALD GUESS, JR. *is a freelance illustrator/cartoonist living in Columbus, Ohio. He's a member of the Association of Timex Sinclair Users (ATSU) group.*

TIMEX SINCLAIR/*BIG FLAP*

2068 • 48K RAM

```
10 DIM B$(130,5): LET C=0
20 FOR X=0 TO 11: READ A$
30 FOR Y=1 TO LEN A$
40 LET I=INT (C/5)+1: LET J=C-I*5+6
50 IF A$(Y)="R" THEN LET C=C+4: GO TO 80
60 IF A$(Y)="Q" THEN GO TO 80
70 LET B$(I,J)=CHR$ (CODE A$(Y)+63)
80 LET C=C+1: NEXT Y: NEXT X
90 FOR I=1 TO 126 STEP 5
100 IF INKEY$="" THEN PAUSE 20
110 FOR J=0 TO 4: PRINT AT 7+J,14;B$(I+J): NEXT J:
```

```
NEXT I: GO TO 90
1000 DATA "QFAKQQFAKQQQPQQRRQGQJQQFQKQQQPQQ"
1010 DATA "RRBIQECQFQKQQQPQQRRMQQQMQGQJQQQP"
1020 DATA "QQRRRDGQJDQQPQQRRRMMQMMQQPQQRRRR"
1030 DATA "DDPDDRRRRMMPMMRRRREMPMICQQQBRRRQ"
1040 DATA "MPMQJQQQGRRRQEPIQECQBICQQQBRRQQP"
1050 DATA "QQQJQGQJQQQGRRQQPQQQJQGQFQQQKRRQ"
1060 DATA "QPQQQJQGQQKQFQRRQQPQQQFQKQQFQKQR"
1070 DATA "RQMPMQQGQJQRRRQLPHAQCQBQRRQIQEQQ"
1080 DATA "LPHQRRRQOQNQQCPBARRRQPQPQAAPAARR"
1090 DATA "REHQLIQQPQQRRRBHQLCQQPQQRRQMQMQQ"
1100 DATA "FQKQAAPAARRQGQJQQFQKQQQPQQRRQFQK"
1110 DATA "QQFQKQQQPQQRRQEDIQQFQKQQQPQQRR"
```

TIMEX SINCLAIR/*MANIMATE*

2068 • 48K RAM

```
10 CLEAR 64699:LET L=29
20 DIM D$(24,3):LET D$(1)="AB":LET D$(2)="CD":LET D$(3
)="  ":LET D$(4)="EF":LET D$(5)="GH":LET D$(6)=" I":LE
T D$(7)="JK":LET D$(8)="LM":LET D$(9)=" N":LET D$(10)=
"OP":LET D$(11)="QR":LET D$(12)="ST"
30 LET D$(13)="AB":LET D$(14)="CD":LET D$(15)="EF":LET
 D$(16)="GH":LET D$(17)="IJ":LET D$(18)="KL":LET D$(19
)="  ":LET D$(20)="MN":LET D$(21)="OP":LET D$(22)="  "
:LET D$(23)="QR":LET D$(24)="ST"
40 POKE 23675,176:POKE 23676,254:FOR Z=1 TO 2:IF Z=2 T
HEN POKE 23675,5
50 FOR I=144 TO 163:FOR J=0 TO 7:READ A:POKE USR CHR$
I+J,A:NEXT J:NEXT I:NEXT Z:POKE 23675,88:POKE 23676,25
5
60 DIM E$(24,3):LET E$(1)="AB ":LET E$(2)="CD ":LET E$
(3)="EF ":LET E$(4)="GH ":LET E$(5)="IJ ":LET E$(6)="K
L ":LET E$(7)="MN ":LET E$(8)="OP ":LET E$(9)="QR ":LE
T E$(10)="ST ":LET E$(11)=" U ":LET E$(12)=" A "
70 LET E$(13)=" B ":LET E$(14)=" C ":LET E$(15)=" D ":
LET E$(16)=" E ":LET E$(17)=" FG":LET E$(18)=" HI":LET
 E$(19)=" JK":LET E$(20)=" LM":LET E$(21)=" NO":LET E$
(22)=" PQ":LET E$(23)=" RS":LET E$(24)=" TU"
80 POKE 23675,93:POKE 23676,253:FOR Z=1 TO 2:IF Z=2 TH
EN POKE 23675,181:POKE 23676,252
90 FOR I=144 TO 164:FOR J=0 TO 7:READ A:POKE USR CHR$
I+J,A:NEXT J:NEXT I:NEXT Z
100 FOR X=1 TO 24:FOR Y=1 TO 3:IF CODE D$(X,Y)<>32 THE
N LET D$(X,Y)=CHR$ (CODE D$(X,Y)+79)
110 IF CODE E$(X,Y)<>32 THEN LET E$(X,Y)=CHR$ (CODE E$
(X,Y)+79)
120 NEXT X:NEXT Y
130 POKE 23676,254:FOR I=10 TO 18:POKE 23675,176:FOR J
=1 TO 22 STEP 3:IF J=13 THEN POKE 23675,5
140 IF INKEY$="" THEN PAUSE 20
150 PRINT AT I,2;D$(J):PRINT AT I+1,2;D$(J+1):PRINT AT
 I+2,2;D$(J+2)
160 PAUSE 7:NEXT J:NEXT I
170 POKE 23675,93:POKE 23676,253:PRINT AT 19,2;E$(1):P
RINT AT 20,2;E$(2):PAUSE 10:PRINT AT 19,2;E$(3):PRINT
AT 20,2;E$(4):PAUSE 10
180 FOR I=2 TO L:POKE 23675,93:POKE 23676,253:FOR J=5
TO 24 STEP 2
190 IF INKEY$="" THEN PAUSE 20
200 PRINT AT 19,I;E$(J):IF J=11 THEN POKE 23675,181:PO
KE 23676,252
210 PRINT AT 20,I;E$(J+1):PAUSE 7:NEXT J:NEXT I
220 POKE 23675,93:POKE 23676,253:PRINT AT 19,I;E$(3):P
```

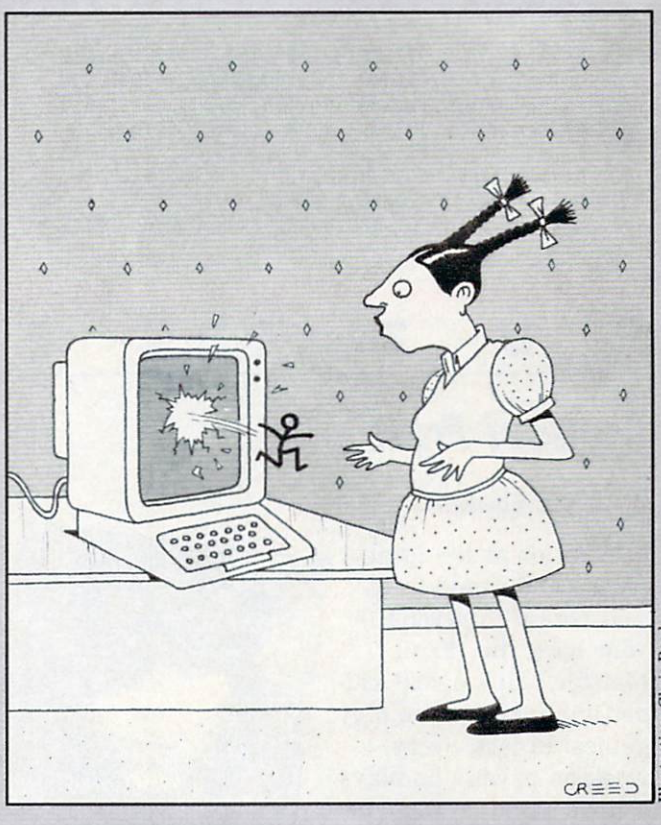


Illustration: Chris Reed

```
RINT AT 20,I;E$(4):PAUSE 5:PRINT AT 19,I;E$(1):PRINT A
T 20,I;E$(2):PAUSE 10
230 IF L=2 THEN STOP
240 LET L=L-3
250 GOTO 130
1000 DATA 0,1,2,2,1,6,10,18,0,128,64,64,128,96,80,72
1010 DATA 128,17,2,2,2,2,2,2,72,136,64,64,64,64,64,64
1020 DATA 0,0,0,1,2,2,1,6,0,0,0,128,64,64,128,96,10
1030 DATA 18,34,33,2,3,1,0,80,72,80,144,64,64,64
1040 DATA 64,64,64,0,0,0,0,0,0,0,0,0,0,1,2,2,0
1050 DATA 0,0,0,0,128,64,64,1,6,10,17,34,1,3,1
1060 DATA 128,96,80,72,80,160,64,64,64,64,64,0,0
1070 DATA 0,0,0,0,0,0,0,0,1,2,2,0,0,0,0,0,128,64
1080 DATA 64,1,6,10,18,34,33,2,3,128,96,80,72,80
1090 DATA 144,64,64,1,0,0,0,0,0,0,0,64,64,64,0,0
1100 DATA 0,0,0,0,0,0,0,0,1,2,2,0,0,0,0,0,128,64
1120 DATA 64,1,6,10,18,18,17,2,2,128,96,80,72,72
1130 DATA 136,64,64,2,2,2,0,0,0,0,0,64,64,64
1140 DATA 0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0
1150 DATA 128,2,2,1,3,10,18,10,9,64,64,128,96,80
1160 DATA 72,68,132,2,2,2,2,2,2,0,0,64,64,128,128
1170 DATA 0,0,0,0,0,1,2,2,1,6,10,18,0,128,64,64
1180 DATA 128,96,80,72,10,5,2,2,2,2,2,0,68,130
1190 DATA 192,128,0,0,0,0,0,1,2,2,1,6,10,18,0,128
1200 DATA 64,64,128,96,80,72,10,9,2,2,2,2,2,0,68
1210 DATA 132,64,192,128,0,0,0,0,1,2,2,1,6,10,0
1220 DATA 128,64,64,128,64,96,80,10,9,1,1,1,1,1,0
1230 DATA 80,144,128,128,128,128,128,0,0,1,2,2,1
1240 DATA 3,2,6,0,128,64,64,128,64,64,64,3,3,1,1
1250 DATA 1,1,1,0,64,192,0,0,0,0,0,0,0,1,2,2,1,3
1260 DATA 3,3,0,128,64,64,128,64,64,64,2,3,1,1,1
1270 DATA 1,1,0,64,160,64,64,32,32,64,0,0,0,1,1,0
```

```
1280 DATA 1,1,3,0,192,32,32,192,160,32,32,3,2,0,0
1290 DATA 1,1,1,0,48,200,160,160,16,16,16,0,0,0,0
1300 DATA 0,0,0,0,1,0,96,144,144,96,208,144,144,2
1310 DATA 2,0,0,0,1,1,0,148,98,80,80,144,16,16,0
1320 DATA 0,48,72,72,48,104,104,104,108,114,48,48
1330 DATA 80,144,144,0,0,12,18,18,12,26,26,27,18
1340 DATA 14,22,20,20,20,20,24,0,12,18,18,12,26
1350 DATA 27,27,51,61,18,18,17,17,18,0,0,6,9,9,6
1360 DATA 13,11,25,0,0,0,0,0,0,0,192,25,38,9,9,17
1370 DATA 17,17,0,64,64,0,0,0,0,0,0,0,3,4,4,3,6,5
1380 DATA 13,0,0,128,128,0,128,128,128,12,11,3,3
1390 DATA 5,9,9,0,128,128,128,0,0,0,0,0,0,1,2,2,1
1400 DATA 3,3,2,0,128,64,64,128,64,64,192,2,3,1,1
1410 DATA 3,3,3,0,192,128,0,0,0,0,0,0,0,1,2,2,1,3
1420 DATA 3,3,0,128,64,64,128,64,64,64,3,1,1,1,1
1430 DATA 1,1,0,64,128,128,128,128,128,128,0
```


Logical Fruit

By Alex Shakar

Your job at the local fruit stand would be a real bore if it weren't for your boss, the "Fruit Meister." He's a real kidder and just loves to play games. In fact, every week on payday he plays a little game he thought up. He calls it "Logical Fruit." If you win, you get a bonus. If you lose, you get zip.

Here's how it works: The Fruit Meister picks out four pieces of fruit from the six bins in the store, puts them in a secret order and hides them behind the counter. You then have to guess the fruit he picked and what order he's placed them in. Your choices include: Apples, pears, cherries, bananas, lemons, and limes. The Fruit Meister can put them in any order or in any combination. For instance, he might arrange them like this: Lemon, lemon, apple, pear. Or cherry, apple, lime, lemon. Or even just four bananas in a row. Six guesses are all you're allowed, so you have to think logically.

When you've arranged your fruit, the Fruit Meister tells you how many of your fruit match his, and how many fruit are in the correct position. That's all he'll say. Using those clues you have to make your next guess. Your brain may smoke a little, but if you think deductively you'll figure out the Fruit Meister's secret arrangement.

ALEX SHAKAR, *15, lives in Brooklyn, New York. He's a musician and wearer of funny hats.*

COMMODORE/*LOGICAL FRUIT*

VIC-20 • 5K RAM • color TV or monitor required

```
10 S3 = 36876:SC = 36879:DIM M(13),W$(13)
20 PRINT CHR$(147):PRINT TAB(4);
30 FOR I = 1 TO 13:READ M(I):NEXT I
40 FOR I = 1 TO 13:READ W$(I):NEXT I
50 POKE 36878,15:FOR K = 1 TO 13
60 POKE S3,M(K):PRINT W$(K);
70 POKE SC,INT(RND(1) * 8) + 24
80 FOR L = 1 TO 80:NEXT L:NEXT K
90 POKE S3,0:FOR L = 1 TO 300:NEXT L
100 PRINT:PRINT TAB(4) "1 PLAYER OR 2?"
110 GET P:IF P < 1 OR P > 2 THEN 110
120 FOR N = 7424 TO 7431:POKE N,0:NEXT N
130 FOR N = 7560 TO 7599:READ A:POKE N,A:NEXT N
140 PRINT CHR$(147):POKE 36869,255
145 FOR N = 7424 TO 7431:POKE N,0:NEXT N
150 IF P = 2 THEN 460
160 FOR K = 1 TO 6:Q(K) = INT(RND(1) * 6) + 1:NEXT K:P
OKE SC,8
170 PRINT CHR$(5);CHR$(18);CHR$(147);"FRUIT SORTER":PR
INT CHR$(18);"GUESS 4 FRUITS"
180 PRINT CHR$(146);CHR$(158);"1 ";CHR$(28);"2 ";CHR$(
30);"3 ";CHR$(158);"3 ";
190 PRINT CHR$(28);"4 ";CHR$(158);"5":PRINT CHR$(18);C
HR$(5);"1 2 3 4 5 6"
200 FOR Y = 1 TO 6:FOR I = 1 TO 4
210 GET U(I):IF U(I) < 1 OR U(I) > 6 THEN 210
220 POKE S3,INT(RND(1) * 106) + 135:FOR Z = 1 TO 10
230 NEXT Z:POKE S3,0:E = U(I):GOSUB 1000
240 NEXT I:C = 0:D = 0:FOR I = 1 TO 4
250 IF Q(I) = U(I) THEN D = D + 1
260 NEXT I:FOR I = 1 TO 4:FOR J = 1 TO 4
270 IF Q(I) = U(J) THEN C = C + 1:U(J) = 0:J = 4
280 NEXT J:NEXT I
290 POKE S3,135 + C * 5:PRINT CHR$(18);CHR$(28);"RIGHT
:";C
300 FOR I = 1 TO 75:NEXT I
310 POKE S3,175 + D * 5:PRINT TAB(8) CHR$(18);CHR$(31)
;"IN PLACE:";D
320 FOR I = 1 TO 75:NEXT I:POKE S3,0
330 IF D = 4 THEN 380
340 PRINT:NEXT Y:PRINT CHR$(18);CHR$(28);"YOU LOSE!"
350 FOR I = 13 TO 1 STEP -1:POKE S3,M(I):FOR J = 1 TO
```

```
100:NEXT J,I:POKE S3,0
360 PRINT:PRINT CHR$(18);CHR$(30);"THE ANSWER IS"
370 FOR I = 1 TO 4:E = Q(I):GOSUB 1000:NEXT I:PRINT:GO
TO 420
380 PRINT CHR$(18);CHR$(159);"YOU WIN!"
390 FOR I = 1 TO 3:FOR J = 1 TO 5:POKE S3,M(J):FOR K =
 1 TO 90:NEXT K,J
400 FOR L = 12 TO 13:POKE S3,M(L)
410 FOR K = 1 TO 90:NEXT K,L:FOR K = 1 TO 90:NEXT K,I:
POKE S3,0
420 PRINT:PRINT CHR$(18);CHR$(158);"PLAY AGAIN? (Y/N)"
430 GET T$:IF T$="" THEN 430
440 POKE 36869,240:PRINT CHR$(147);CHR$(31);CHR$(115);
:POKE SC,27:IF T$ = "Y" THEN RUN
450 END
460 POKE SC,8:PRINT CHR$(18);CHR$(147);"FRUIT MEISTER"
470 PRINT CHR$(18);"CHOOSE 4 FRUITS":PRINT CHR$(18);"1
 2 3 4 5 6"
480 PRINT CHR$(146);CHR$(158);"1 ";CHR$(28);"2 ";CHR$(
30);"3 ";CHR$(158);"3 ";
490 PRINT CHR$(28);"4 ";CHR$(158);"5"
500 FOR P = 1 TO 4
510 GET Q(P):IF Q(P) < 1 OR Q(P) > 6 THEN 510
520 POKE S3,INT(RND(1) * 106) + 135:PRINT CHR$(18);"*
";
530 FOR I = 1 TO 10:NEXT I:POKE S3,0
540 POKE S3,0:NEXT P:GOTO 170
570 POKE S3,INT(RND(1) * 106) + 135
580 PRINT CHR$(18);"* ";:FOR I = 1 TO 10:NEXT I:POKE S
3,0
1000 IF E = 1 THEN PRINT CHR$(158);"1 ";
1010 IF E = 2 THEN PRINT CHR$(28);"2 ";
1020 IF E = 3 THEN PRINT CHR$(30);"3 ";
1030 IF E = 4 THEN PRINT CHR$(158);"3 ";
1040 IF E = 5 THEN PRINT CHR$(28);"4 ";
1050 IF E = 6 THEN PRINT CHR$(158);"5 ";
1060 RETURN
2000 DATA 135,143,147,151,159,163,167,175,179,183,187
2010 DATA 191,195,L,O,G,I,C,A,L,**,F,R,U,I,T,8,24,48
2020 DATA 48,48,48,24,8,8,107,127,127,127,127,62,54
2030 DATA 0,60,126,255,126,60,0,0,64,32,48
2040 DATA 72,71,231,231,224,8,28,28,62,62,127,127,62
```

Illustration: Chris Reed

SCREENING ROOM

THE RATING GAME

BEACH-HEAD

For Commodore 64 (disk and cassette); joystick required. Access Software, Inc., 925 E. 900 S., Salt Lake City, UT 84105; (801) 532-1134. $34.95

GRAPHICS: ■■■■■
EXCITEMENT: ■■■■
ORIGINALITY: ■■■■■
EASE OF USE: ■■■■
CHALLENGE: ■■■■■
SHELF LIFE: ■■■

Beach-Head is no slouch when it comes to action, graphics, and sound effects. This multiscreen arcade war game is one of the most exciting programs introduced in a while. Battle is set on and around a Japanese-held island in the Pacific during World War II. It's up to you to lead a 10-ship fleet on a mission to reach and destroy the enemy fortress of Kuhn-Lin at the center of the island.

Game play consists of six separate sequences. You guide your fleet to the island, navigate each ship through a secret passage, shoot down an onslaught of enemy planes, fire your heavy guns at the enemy's fleet, get your tanks through obstacles and the enemy's defenses, and attempt to destroy Kuhn-Lin. Each stage of the game requires a joystick and a steady hand. Additional features include a pause button, one or two player option, skill selection, abort feature, sound and border color adjustments, and a top-10 scoreboard that can be saved to disk.

One of the most stunning features of this program is its sound. Machine-gun and cannon fire, shells whistling out of the air and splashing into the sea—it all sounds authentic (like what you hear in the movies).

The game is top-rate. It's very well-planned out, and will provide many hours of enjoyment, because even if you're lucky enough to destroy Kuhn-Lin once, you still get to try it on more difficult levels. If you want arcade action, strategy, realistic graphics, and plenty more, you'll find it all in *Beach-Head*.

RICH UHLIG, *17*
Toledo, OH

THE RATINGS

Software is rated on a scale of one to five in each of six categories.

■ POOR
■■ FAIR
■■■ GOOD
■■■■ VERY GOOD
■■■■■ EXCELLENT

N/A = NOT APPLICABLE

GRAPHICS: The quality and sophistication of the graphics given the computer's capabilities.

EXCITEMENT: The pace, pulse, and action of the game.

ORIGINALITY: The degree to which it's a trailblazer.

EASE OF USE: Its boot-up playability and simplicity. A low rating doesn't mean it's a poor game.

CHALLENGE: This speaks for itself.

SHELF LIFE: Its ability to maintain interest over time and not grow stale.

DROL

For Atari, 48K (disk); also for Apple, 48K (disk); Commodore 64 (disk); joystick (optional). Broderbund Software, Inc., 17 Paul Drive, San Rafael, CA 94903; (415) 479-1170. $34.95

GRAPHICS:
EXCITEMENT:
ORIGINALITY:
EASE OF USE:
CHALLENGE:
SHELF LIFE:

There's a world out there that most people don't even know about. And you can get there without even leaving your house. Where is this other world, you ask? Well, I can't tell you, because I don't know. All I know is it's called *Drol*.

Drol is an underground civilization full of long corridors, stacked one on top of the other, where dangerous creatures roam. You're roaming those corridors, too, and you have five lives. Outfitted in a space suit and jetpack, you search the hallways and try to rescue (for points, of course) a lost family and their pets.

The corridors get very crowded and dangerous. You'll need to use your gun to clear a path. If you want to avoid danger or get to a member of the family, dive through the trap doors that dot the passageways or use your jetpack.

Waiting around every corner are dangerous hopping scorpions in the first level, killer bunny-rabbits (at least that's what I think they are) in the second level, and snakes in the third level. You'll also find swords, daggers, and other assorted knives in the third level. After you complete this level, you'll see a little cartoon of the mother getting her children back, and then the game starts all over again. This time it's harder: There's more to fight and the obstacles are tougher.

Drol's graphics are awesome. The cartoons are funny, too. My one real complaint about the game is that it takes way too long after you die to come back to life and start over again. I realize that reincarnating a person takes time, but this is ridiculous!

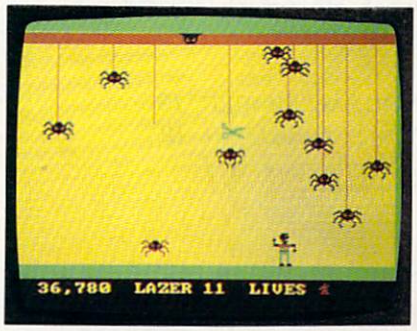
KIMBERLY GUZEMAN, *13*
Sunnyvale, CA

SPYDER

For IBM PC, 64K (disk); joystick optional. Mirror Images Software, Inc., 504 Broadway, Troy, NY 12180; (518) 274-2335. $39.95

GRAPHICS:
EXCITEMENT:
ORIGINALITY:
EASE OF USE:
CHALLENGE:
SHELF LIFE:

Are you paranoid of furry things with eight legs? Would you enjoy blasting them off your ceiling with a laser? Or stomping on them with your super stomper shoes? In this game, you're just doing your best to control a bad pest problem. But the pests aren't



your ordinary spiders. These arachnids are armored!

The scene is your living room, where you run around shooting up at the spyders that are descending from webs looking for an easy meal. If they reach the floor, they charge you and you have to stomp them.

On higher levels, some of the attacking spyders, the super spyders have tougher heads. You'll need to land two shots to kill them. You have to be a good shot, because if you hit a spyder, but miss his head, he'll lose his grip and plummet to the floor where he'll crawl toward you and try to bite. If any spyder touches any part of you except your super stomper shoes, you die. You've got five lives before the game ends.

Arachnid attacks come in waves. After successfully fending off four assaults, you enter their egg chamber where lots of spyder eggs are held suspended above you. A laser shot placed in the center of an egg will make it disintegrate. But a shot that misses the center won't prevent the egg from hatching. Eventually it falls to the floor and it'll be stomping time again.

Overall, we think *Spyder* is a good game. The graphics are sharp and the animation of the man and the spyders is clean and fluid. There is one thing, though: There's not a whole lot of variety. After playing it day after day, week after week, we did get a bit tired of it.

ERIC SABERHAGEN, *13*
TOM SABERHAGEN, *12*
Albuquerque, NM

ROCKY

For Coleco ADAM (cartridge); Super action controllers required. Coleco Industries, 99 Quaker Lane S., W. Hartford, CT 06110; (800) 842-1225. $30

GRAPHICS:
EXCITEMENT:
ORIGINALITY:
CHALLENGE:
EASE OF USE:
SHELF LIFE:

The theme from *Rocky* sounds in your ears. Your heart beats faster and sweat trickles down your face as you see Clubber heading your way! WHAP! You're dazed. You try to recover by backing off, but he keeps coming at you. A right to the head! You hit the canvas and the ref counts off: 10 . . . 9 . . . 8 . . . you lie there, stunned . . . 2 . . . 1 . . . . Looking up, you see Clubber, his arms in the air, the golden belt around his waist. You call for a rematch. After pressing a key, you're on your feet again and ready for another go at the title!

Rocky is the best boxing game I've ever seen. The graphics are very realistic, the movements of the fighters are smooth, and Clubber even looks just like Mr. T.

You get your choice of being Rocky or Clubber. And you can play a friend or the computer on any of four levels. Points are scored when a fighter lands punches and when he knocks his opponent down. If you get a lot of punches in, your opponent's "daze" indicator will show that he's just about ready to hit the canvas. There's also a "fatigue" scale that shows if you're getting hit by too many body punches. The more fatigued you are, the slower you move.

All your moves are made with a Super Action Controller. It's like

a joystick with an extra handle underneath and with more action buttons. With the controllers, you can make Rocky or Clubber dance around the ring, jab, duck, block, and more.

At the beginner skill level, the computerized competition's not so tough. But even my friends were easier to beat than the computer when it's set at the fourth level. That's one of the good things about the game. It's easy to use, but tough to master. I think I'll be playing it for a long time.

TONY HARRIS, *13*
Glencoe, IL

TYCOON

For Commodore 64 (disk); also for Apple, 64K (disk); Atari, 48K (disk); IBM PC and PCjr. 128K (disk). Blue Chip Software, Inc., 6744 Eton Ave., Canoga Park, CA 91303; (213) 346-0730. $59.95

GRAPHICS: N/A
EXCITEMENT:
ORIGINALITY:
EASE OF USE:
CHALLENGE:
SHELF LIFE:

You're a commodities investor. Start with $10,000, buy and sell combinations of 15 commodities ranging from soybeans to Japanese yen, and try to make your first $1,000,000.

You have one year to accumulate your fortune. The game has 52 turns, each representing one week. You're presented with a series of graphs each turn. The first is the commodity index, which shows the overall market picture (whether the market, on average, rose or fell). Next, graphs show the past several weeks' prices for each of the commodities you own. After that, you get news items pertaining to certain commodities, like: DUE TO FROST, THIS YEAR'S ORANGE CROP HAS BEEN DAMAGED.

Next, a list of all the commodities is displayed with prices, changes (how much they went up or down in the last week), and how much each change affects you. A menu lists your options for each turn. You then can choose to buy or sell a com-

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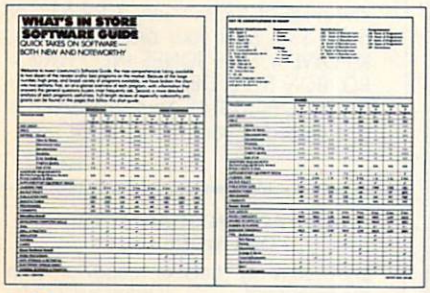

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modity future, look at a graph showing the prices of any commodity over the past several weeks, look up past news items, get a description of a commodity, or just move on to the next week.

Tycoon is almost flawless. Everything is suprisingly clear. It takes very little time to get the hang of the game . . . and it's very addictive. Before playing *Tycoon* I knew nothing whatsoever about commodities. From reading the instructions and playing the game, I learned a great deal. *Tycoon* uses all the real jargon of commodities. After a few games I was talking like a broker. *Tycoon*'s realism makes you feel as if you're really buying or selling millions of dollars worth of commodities. I know *I* felt great after making *my* first million.

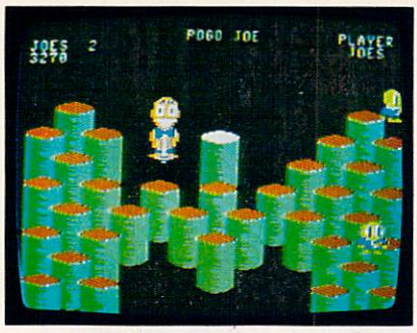
MICHAEL SANDERS, *15*
Great Neck, NY

POGO JOE

For Commodore 64 (disk and cassette); also for Atari, 48K (disk and cassette); joystick required. Screenplay, Box 3558, Chapel Hill, NC 27514; (919) 493-8596. $24.95

GRAPHICS:
EXCITEMENT:
ORIGINALITY:
EASE OF USE:
CHALLENGE:
SHELF LIFE:

The first thing you think of when you see *Pogo Joe* is *Q*bert*. It won't take long for you to realize how different the two games actually are. For one thing, *Pogo Joe* is better.



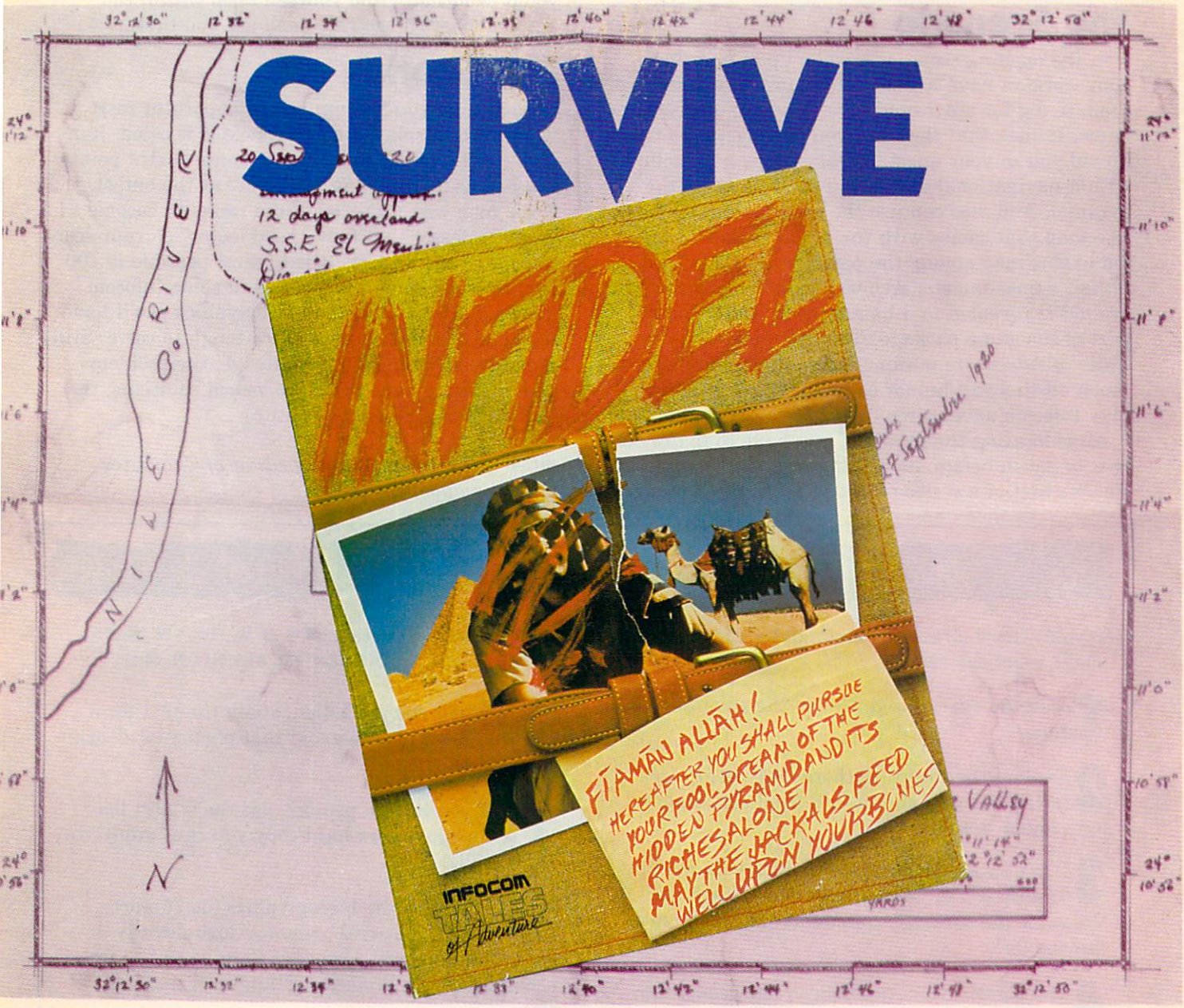
This bouncy game has 64 (!) different screens. Each has a different (and more difficult) arrangement of cylinders or disks for Pogo Joe to hop on. Up to 10 different types of creatures (some you pursue, others pursue you) hop about the screen. As Pogo Joe, you bounce from shape to shape, change the colors of every "stepping stone" on each screen, and jump on creatures for points.

Each time Pogo Joe changes all the shapes on a screen, you advance to the next array. Screens differ in more ways than just their arrangement of cylinders and disks. Some contain flashing shapes that, when stepped on, cause all the creatures on the screen to be destroyed. Some screens are full of invisible shapes that only appear after you've stepped on them.

Overall, *Pogo Joe* is great for people who'd rather jump around and step on things than play a shoot-'em-up. The graphics are excellent and everything is vivid and 3-dimensional. One word of caution, though. Watch out for the cute little *Pogo Joe* theme song. After a few minutes it really gets on your nerves.

SOREN KAPLAN, *15*
Walnut Creek, CA

SURVIVE



Beat the Sahara's scorching heat, find a lost pyramid, and uncover an ancient solid-gold sarcophagus. Sound easy? It isn't.

By Shay Addams

A pack of voracious rats gnaws at my legs as I curse the day I met that old spinster, Miss Ellington. It was her crazy idea to have me finish the expedition that killed her father back in 1920. If not for her, I'd never have trekked across the vast Egyptian wasteland to share a tomb with some unknown queen of the Nile. The snarling rodents swarm across my body and it's all over—the game, that is—a text adventure I've been playing for the past two weeks.

The first of Infocom's "Tales of Adventure" series, *Infidel* drops you off inside a computerized novel, where you're a small-time explorer who stumbles across the chance to loot a pyramid of a gold sarcophagus and a fortune in gems.

The Scenario

In the opening scene, you wake up to find that your workers have walked off because you forced them to dig for a pyramid on a holy day—thus the name, Infidel, that they call you in a parting letter. To aid you in your quest, a plane drops a parachute with a navigational device you need to locate the pyramid. You also can use the crinkly, parchment-like map that comes with the game. Miss Ellington found this map among the papers of her deceased father, a once-famous archaeologist. (This background is revealed in a handwritten letter that's part of the game package. You also get a *True Tales of Adventure* minimagazine that contains as much off-the-wall humor as helpful tips on how to play Infocom adventures.)

After locating the pyramid, you have to figure out how to get in before descending into the Chamber of Ra, the first of a series of dusty, death-filled rooms that await you. It's a treacherous trip through the pyramid's mazelike halls, because the temple priests left plenty of cleverly concealed traps to foil looters. After solving the riddles of the circular room, the cube rooms, and other brain twisters, you'll eventually find yourself deep within the antechamber (if the rats don't get you first).

The Scoring

Each time you accomplish an important task, your score (displayed at all times) is boosted. Ransacking the rooms for treasure snares extra points. Classed as a "fumbling beginner" at the outset, you work your way up through the ranks to become a "poor professor" or "fairly good looter" as your score improves. High scores (the highest possible is 400 points) won't come as easily as in some Infocom games. For instance, the hieroglyphics you'll have to decipher make puzzles extra tough to solve. Still, no matter how hard the challenge, the problems you'll face all have perfectly logical solutions, the hallmark of a classic adventure.

SHAY ADDAMS *is managing editor of* Computer Games *magazine.*

Info for the Infidel

Try out these strategies and maybe, just maybe, you'll avoid the rats.

1 Examine everything! This is the adventurer's credo.

2 Explore the campsite thoroughly before entering the pyramid. You'll need certain objects found there.

3 Don't enter the desert without a water supply (unless you're looking for a slow death and the same old sarcastic comments that Infocom's famous for).

4 The solution to a problem in one room often requires an object or clue from another room.

5 Make a map. The fewer moves it takes to get somewhere, the better.

6 If you get lost, drop an item and walk around until you see it again to get your bearings.

7 Make playing *Infidel* a group or party game. Different perspectives on a situation can make a big difference.

8 Think logically (like Spock) when analyzing each description for clues.

9 Try every direction: N, S, E, W, NW, SW, NE, SE, UP, DOWN, IN, OUT, ENTER, STAND ON, etc.

10 When you get killed, study the text for a clue on how to avoid that particular death the next time.

11 If you have a printer, use the SCRIPT feature to obtain hard copy you can "study" in study hall.

12 Decipher the hieroglyphics (don't worry, they're not real graphics, just cleverly arranged characters). Compare them with one another, and with Professor Ellington's translations.

13 Use the SAVE feature to do more than just continue a game later. Play up to a key point and SAVE it as game 0. Explore in one direction from that point and SAVE it as game 1; RESTORE game 0, then venture in another direction and SAVE it as game 2. Combine the information gathered in both when you start game 0 again, and SAVE the results as game 3.

14 Call Infocom and plead temporary insanity; they've been known to give clues to adventurers who've completely lost their way. –S.A.

K-POWER

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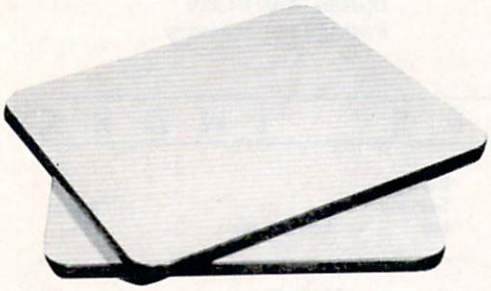
RISING STARS

HARDWARE

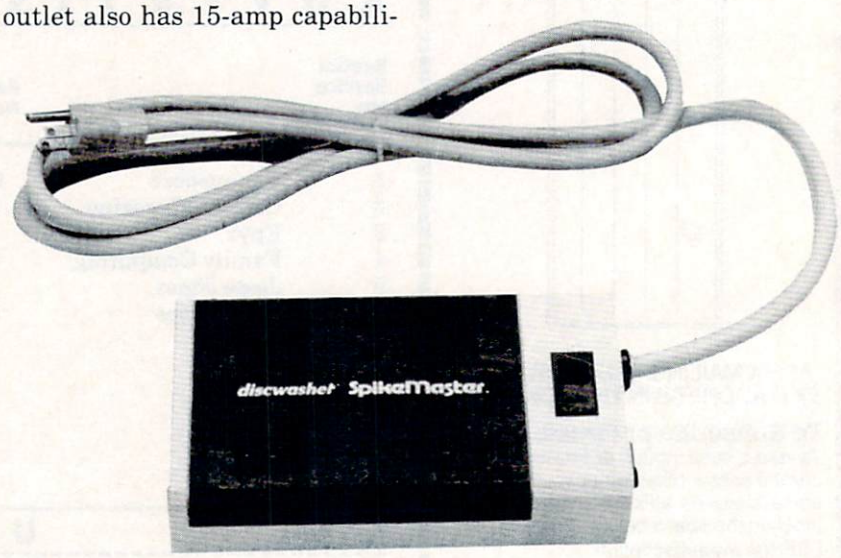


Turn, turn, turn

Avoid eyestrain and neck aches with a monitor that swivels and tilts. It only takes a touch to move your monitor up, down, left, or right. Touch-n-Turn is available in three sizes and in two colors (putty and natural walnut). The turntable is priced between $59.95 and $69.95 and is available at computer dealers or through Aztec Electronics, 12345 Westminster Ave., Santa Ana, CA 92703; (714) 554-1730.

The urge to surge

Guard your treasured computer, peripherals, and software from damaging electrical surges. The SpikeMaster provides protection with four widely-spaced sockets, a circuit breaker, and an on/off switch. The electrical outlet also has 15-amp capabilities and active surge suppression devices. Purchase the device for $79.95 at computer stores or from the manufacturer: Discwasher, 1407 N. Providence Rd., P.O. Box 6021, Columbia, MO 65205; (314) 449-0941.

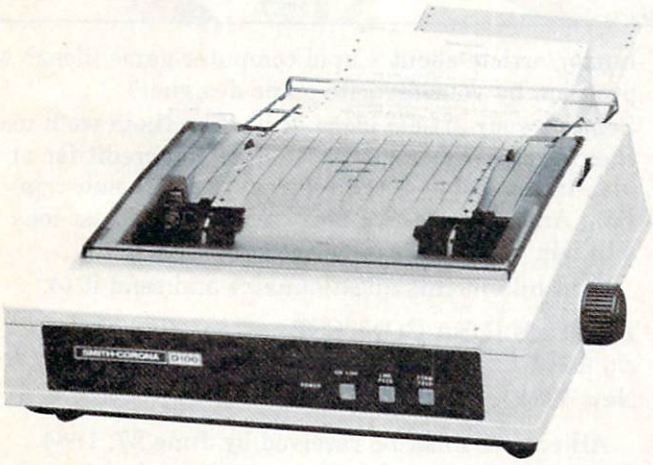


Stick out

Keep your Apple ahead of the game with the StarFighter joystick. Made especially for the Apple IIe (and Apple II and II plus with adapter cable), this joystick features a high/low sensitivity button, a throw selector, and dual left/right firing buttons. StarFighter costs $49.95 and can be purchased at computer stores, or contact: Suncom, Inc., 650 Anthony Trail, Northbrook, IL, 60062; (312) 291-9780.

Suncom draws the line

Go ahead and give graphics tablets a shot. This Suncom computer sensor pad has a variety of applications. Animation Station comes packaged with a full-menued Ultra-Graphics program. Five other graphics programs will cover areas like word-processing, education, design, and animation. Suncom also plans to make the graphics tablet compatible with competitors' software. Priced between $80 and $125, Apple IIe and IBM PC*jr* versions are scheduled for release in May, with Commodore 64 and Atari models slotted for mid-June. Additional software will sell for between $30 and $50. Animation Station will be available at computer and software dealers, or from Suncom, Inc., 650 Anthony Trail, Northbrook, IL 60062; (312) 291-9780.



Printer power

Smith-Corona thinks that powerful printers shouldn't cost you an arm and a leg. The D-100 dot-matrix printer moves at 100 characters per second with an 80-character column width. Some of the printer's neat features include choice of six pitches (six settings for numbers of characters per inch), bold-face or elongated print, and the capacity to print out high-res pictures. The Smith-Corona D-100 is available in computer stores for $395, or from Smith-Corona, 65 Locust Ave., New Canaan, CT 06840; (203) 972-1471.

Screen scribble

You don't need a lot of talent—or a lot of money—to have fun with this light pen. Plug the Edumate light pen into the joystick port of your Atari or Commodore computer, and create your own computer paintings. Four programs, including a drawing routine, games, and a disk loading utility are included with the light pen. In addition, Futurehouse's educational software is compatible with the pen. The Edumate light pen costs $34.95 and is available at computer stores or through Futurehouse, P.O. Box 3470, Chapel Hill, NC, 27514; (919) 967-0861.

Photo: Gary Kane

CONTEST

WHY DON'T YOU WRITE AN ARTICLE ABOUT IT?

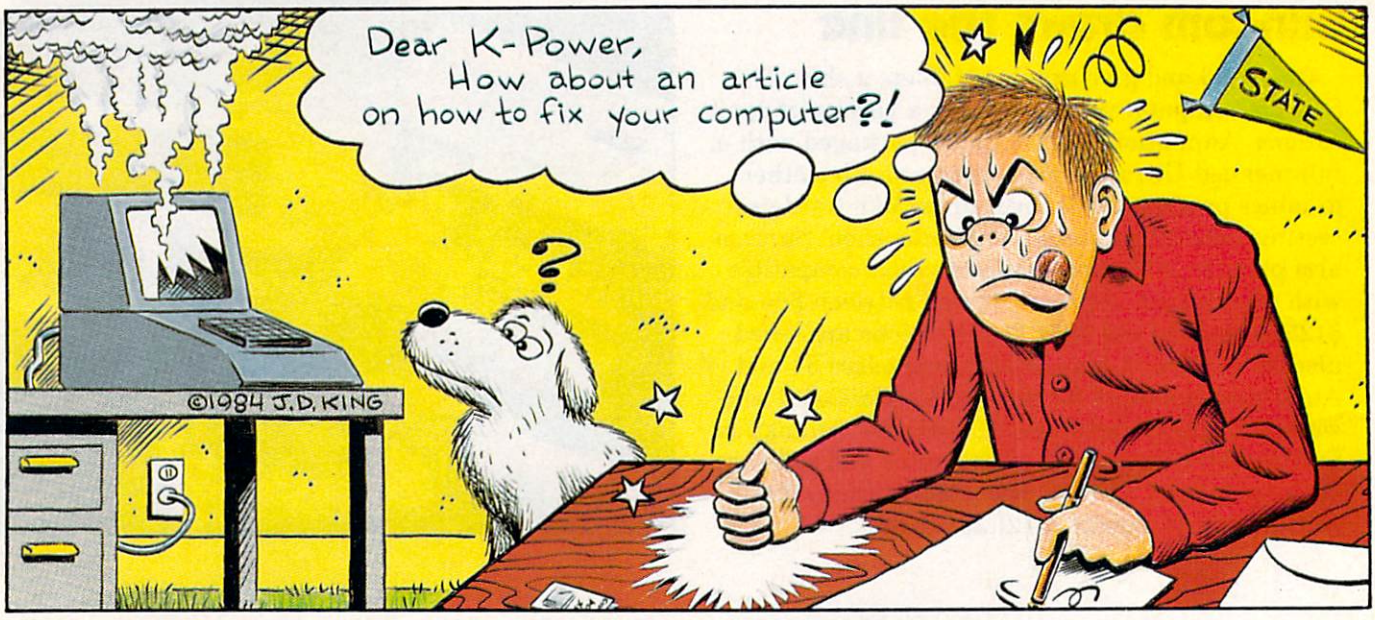


Illustration: J.D. King

The boss was screaming at us during lunch the other day, insisting that we come up with some fresh ideas for K-POWER articles. "An interview with Marla Heasley, the beautiful new 'A-Team' costar, about programming in BASIC? That's the STUPIDEST idea I've ever heard in my life!!!"

As I continued to get yelled at for trying to use my influence as a K-POWER editor to meet the girl of my dreams, it came to me. Why not have a contest where the readers tell *us* what to write about! I suggested it to the boss. "Great idea!" the boss said. "Glad I thought of it!"

So send us your story ideas! Tell us what you want us to write about. Should we write something about programming in FORTRAN? How about a humor article about stupid computer-game ideas? A program by your favorite game designer?

Send us your article ideas. If we like them we'll use them in K-POWER. We'll even give you credit for an idea in the Table of Contents. And a free subscription. And a K-POWER T-shirt. And . . . the best idea will win you a free computer game.

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5. Favorite person of all time? _____
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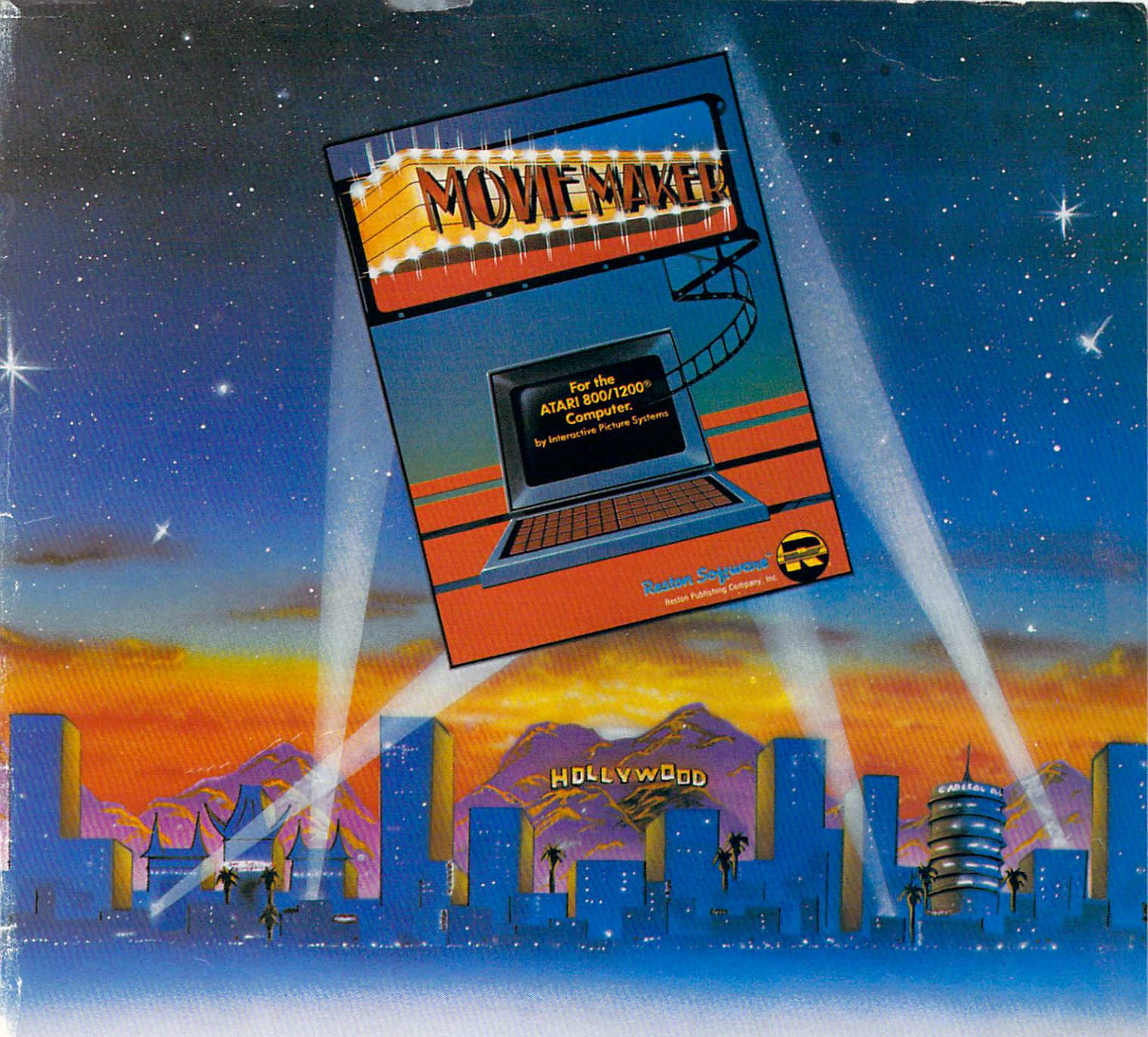

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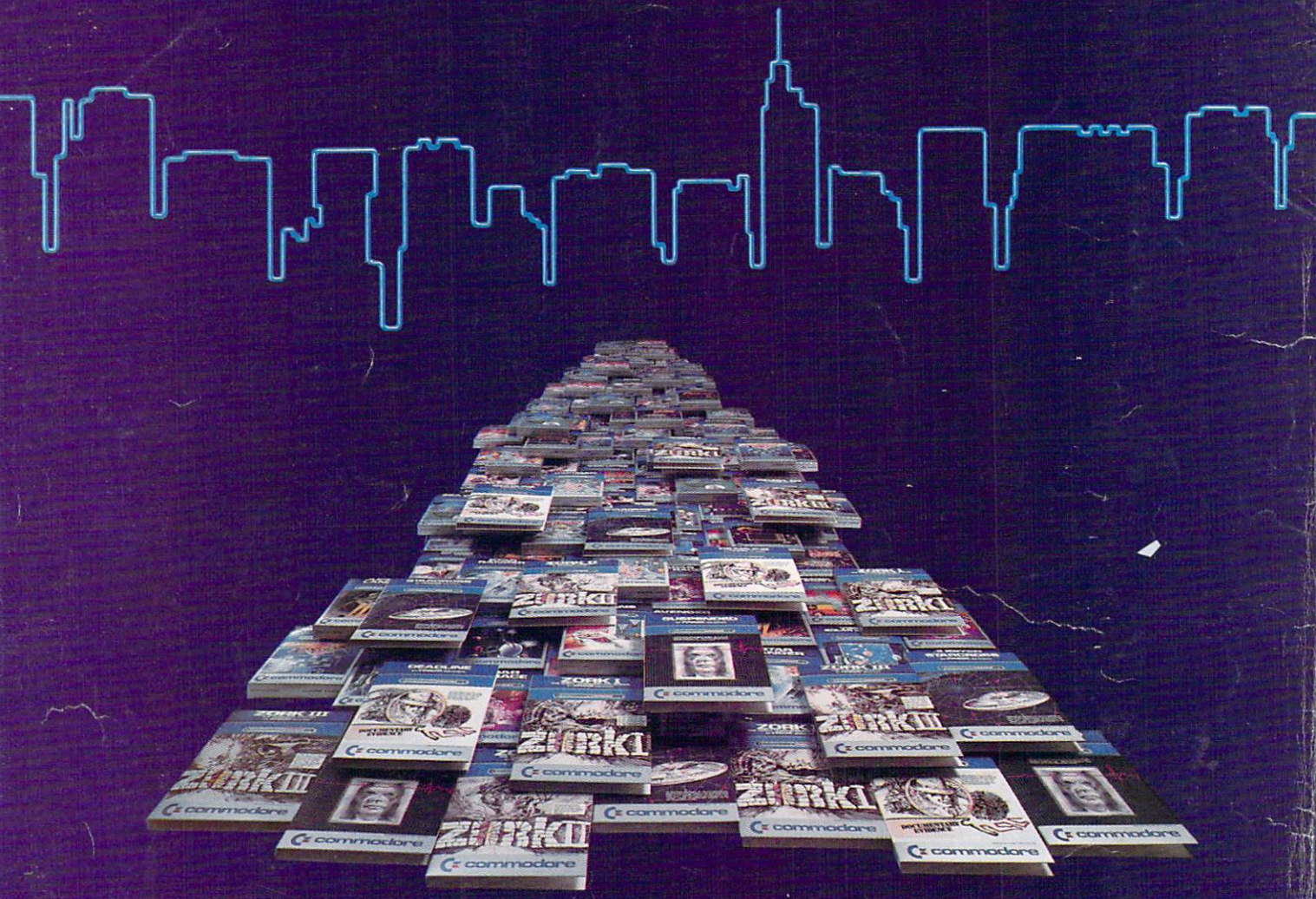

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