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**Where to
find read/write
heads and
how to program
with EPROMs**

for these first two lines.)

Line 30 prepares the screen for the first question from the magician. In line 40 the program accepts the question then moves to line 50 to see if the first letter of the item corresponds to the first letter of the question. Remember, the case must also agree if there's to be a match.

If a corresponding item is found, line 70 prints the word—after taking a dramatic pause. If there's no match, the program moves to line 80 to report that it's stumped. Either way, the program then returns to the prompt for a new question.

This is just the basic program. You can add your own bells and whistles later. You may want to save lists of items to disk, add spooky graphic effects and sounds, and so on to make the program more entertaining.

Read/Write Heads

My local Commodore service technician has advised me to replace the read/write heads in my 1571 disk drive. Distributors, meanwhile, haven't been able to suggest anything better than purchasing a new drive unit. Can you tell me how to get a read/write head set without buying an entirely new disk drive?

LODOVICO BONINSEgni
CURRIDABAT, COSTA RICA

Our information, which we got from a local service technician, is that read/write head sets have been discontinued. Instead, the closest option is to have your technician order a 1571 drive assembly (part number 252092-01). As of late 1991, it has a suggested retail price of \$148.50.

EPROMs and HEX

I would like to know how to put a program on an EPROM and then make the 64 recog-

nize the EPROM's presence. I would also like to know where I can find a cross reference to hex characters, such as those in MLX listings.

JOSEPH YARMEL
NANTICOKE, PA

Erasable programmable read only memory (EPROM) is a chip upon which a program or group of programs can be stored. To program the chip requires a piece of hardware called, naturally enough, an EPROM programmer. The chips may also be erased and reused. For the professional programmer and hobbyist alike, EPROMs allow a quality alternative to software packaging with a high level of protection from both physical and software abuse. When an EPROM cartridge board is plugged into the 64 expansion port, its contents are found from memory address 32768 (\$8000) onward.

EPROMs come in several capacities, such as 4K bytes (16 CBM disk blocks), 8K (32 blocks), 16K (64 blocks), 32K (128 blocks), and 64K (256 blocks). Code painted on the EPROM identifies its capacity. A popular series of EPROMs is the 2700 series, whose code is a 27 followed by the capacity in kilobits. For example, with the NEC D27128D EPROM you would divide the 128, indicating 128 kilobits, by 8 to discover that its capacity is 16 kilobytes or divide by 2 to find that the equivalent in disk storage is 64 blocks.

Once you've installed your program on this chip, you're ready to make your software autobooting. One of the first things the Kernal RESET routine does is check locations 32772-32776 (\$8004-08) for the string of characters CBM80 (HEX C3 C2 CD 38 30). If these exact characters aren't found, the Kernal RESET process continues.

If the CBM80 is found, the RESET routine is interrupted, and the processor immediately jumps to whatever location is specified by the cartridge cold-start vector. This vector is expected to be found at locations 32768-32769 (\$8000-01). A pointer must be placed here, in standard low byte/high byte order, directing the processor to the beginning of the cartridge code. From that point on, your cartridge software must handle all the initialization itself for any functions it will use, such as the I/O devices or Kernal or BASIC routines. The Kernal initialization routines are, of course, still available to be called upon for this. Unless you know exactly what you're doing, your cartridge should use these routines to initialize the functions it needs. For EPROM supplies, call Jason-Ranheim at (800) 421-7731.

The second part of your question is easy. Hex, short for hexadecimal, or base-16 numbering, is an easy, two-character way of representing all 256 possible values that might be contained in the 64's memory. You can't tell anything from these numbers themselves. A particular value might be a number, letter, or other kind of data. It could also be part of a machine code command or an address in a jump table. If you want to examine a program, you'll have to view it with a disassembler. You can't really tell anything from a MLX listing. However, if you want to know the text equivalents of hex codes for, say, screen printing, take a look at the table in the Commodore 64 Programmer's Reference Guide.

Send your questions and comments to Gazette Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. □

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D'IVERSIONS

Fred D'Ignazio

GOLMER THE ROBOT

Last month we announced the winners of the Design-a-Robot Contest. This month we'll point the spotlight at the grand prize winner, Gordon H. Smith of Kenosha, Wisconsin, and his robot GOLMER.

GOLMER is an unusual name, even for a robot. It stands for Gordon's Own Little Mechanical Electrical Robot. GOLMER was the most impressive contest entry that I received. The package included photographs, hardware diagrams, program listings, even an Interface Report.

Now, I'll turn the column over to Gordon Smith and let him tell you what GOLMER can do now and what's planned for the future.

GOLMER is a self-contained mobile robot with external controls. At the present

time GOLMER is slow, and his abilities are limited. He was designed to go to the refrigerator and get me something to drink. When he can do that, I will consider him useful, but he'll never be finished. There will always be upgrades.

He'll have on-board logic to avoid obstacles and will be able to communicate with an external computer through FM radio signals. This will allow him to receive complicated commands and to send status reports to the main computer.

Status reports will include distance and direction traveled, path taken, and position of each moving part on the robot. Also, there will be an adjustable light source and indicators for running time and estimated power remaining. In the future I may add to his circuits a thermometer, a smoke alarm, and an intruder detector. GOLMER could be tied into an alarm system and have his own built-in protection, such as a squirt gun. I may even install an ultrasonic pest repellent for ants, mice, mosquitoes, bees, and so on.

GOLMER's design is patterned after Johnny Five in the movie *Short Circuit*. I like this design because it can fold itself into a small package. The head is patterned after the security robots in the movie *Chopping Mall*. Much of GOLMER's design is based on a *Radio Electronics* article from 1981, "How to Build Your Own Robot for Under \$400." The main principle involves sending touch-tone frequencies over a walkie-talkie. GOLMER decodes the frequencies into functions.

GOLMER uses two basic programs, one written in 8088 assembly language and one written in C. Both do the same thing. A menu lets you sample incoming data from eight data switches or eight feedback ports, or you can send out numbers that will turn on any or all

of eight outputs. With eight binary inputs or outputs, each digit can represent a number from 0 to 255. With a microprocessor on board, this number can give you 256 separate commands. Each command could initiate a series of tasks.

I would like to use infrared light to avoid obstacles and to locate objects to pick up. Infrared could be transmitted through fiber optics to the hands to detect objects. Hall effect sensors could detect metal objects, and ultrasonics could be used to measure distances in order to map a room for future reference.

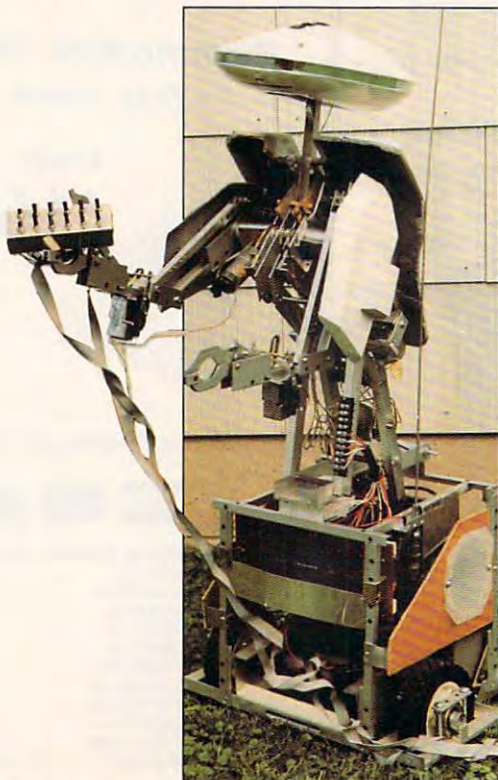
A JAEMCO speech synthesizer will be added to give GOLMER a voice. I want to give him ears, but that's much more complicated. An existing voice-detection circuit has only five commands built in: forward, reverse, left, right, and stop. It would be nice to pick up sounds with a microphone and try to compute a response to spoken language.

My interest in robots began when I was ten years old, watching *Lost in Space*. Twenty years later I tried to build the robot that appeared in the series. It looked good, but I found out I didn't know enough about the robotics. So I took a course in the subject at Gateway Technical College in Kenosha, Wisconsin. I built GOLMER as a final project.

I am trying to complete work on GOLMER so I can use it to start a robot rental business. If that works out, I would like to manufacture robots for entertainment and for useful tasks like housecleaning and aiding the handicapped.

GOLMER is a success at entertaining and making instant crowds. Children of all ages want to see GOLMER again and again. They want a robot of their own; they want to know how to get one or how to make one. Everyone needs one. □

**Gordon Smith's
GOLMER won top
prize in our
Design-a-Robot
Contest. Here
are some of its
specifications.**



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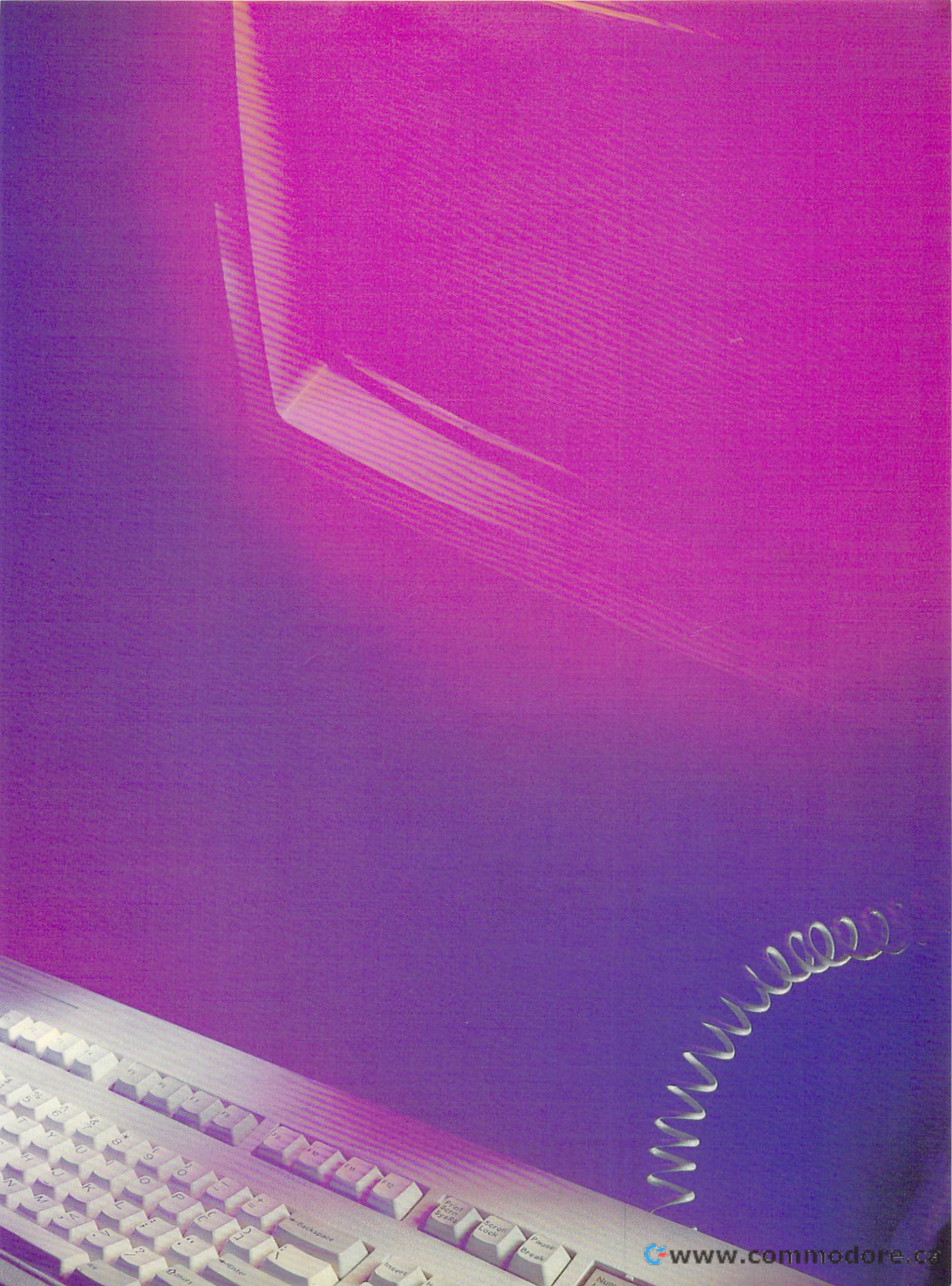


HAVE YOU EVER DELETED A CRUCIAL
FILE OR COMMITTED SOME OTHER COMPUTER
BOO-BOO? YOU AREN'T ALONE.

BITS, BYTES, AND BLOOPERS

BY JULIA L. WILKINSON

So you made a stupid mistake. Mistakes are to be expected, especially when you're learning something. Since working with computers is a continuous learning process, you should expect to make your share of blunders. Perhaps you can take some solace in the fact that other people are doing the same silly things—and some even sillier.



If you're one of those people who are berating their momentary idiocy, take heart. Worse things have been done while worshipping at that silicon altar. Take a minute to peruse these disconcerting anecdotes from the Computer Boo-Boo Hall of Fame. If you've been guilty of one of these mistakes, take comfort in the fact that you're not alone. No names have been used for obvious reasons.

On Campus

A Penn State student who'd just completed a paper using MacWrite asked the computer lab consultant how to print it. He responded that she should pull down the File menu and select Print. The ensuing blank stare told the consultant that the student didn't know how to use a pull-down menu. "See that little arrow?" he asked, pointing to the screen. "Use the mouse to move it to the word *File* at the top of the screen. Then hold the button down and drag it downward until you reach *Print*." The student then picked up the mouse, put it against the monitor, and began to move it up and down the screen.

A University of Delaware student approached a lab consultant and said, "I can't find the Any key."

"What do you mean?" asked the confused consultant.

"Oh, you know," the student said, "right here where the program instructions say, 'Hit any key to continue.'"

Mainframe computer systems at schools and universities normally permit access by students and faculty. To protect each person's files, programs, and electronic mail, however, most systems require a password from the user. A student logging on to the computer at one large university had to abort this process when it came time to select a password. He couldn't think of a six-letter word.

A Carnegie Mellon University student tried to log on to the CMU computer by entering his user identification number (USERID) from the College of William and Mary.

Another student tried to log on to the mainframe using the serial number of his PC as a USERID.

A student was told to put the system disk and one data disk into a Macintosh. She put the two 3½-inch disks on top of each other and crammed them both into the same drive. Along the same lines, another computer novice tried to jam a disk into the slight opening between the A and B drives.

Do As I Say

These mistakes may seem silly, but we should bear in mind that the instruction-

al terminology is often not accurate or specific enough. It's the old story of a person who religiously follows the directions for making a peanut butter sandwich. When instructed to place the peanut butter on the bread, the person sets the entire jar on the slice.

That might explain why when a consultant told a customer over the telephone to put the disk in the drive and close the door, he heard the sound of footsteps followed by the sound of a door slamming.

Another gentleman complained that his manual instructed him to "remove the diskette and hold for transmission." That wasn't too helpful. He held the disk for an hour and a half, and nothing happened. Many tales are told of folks who, when asked to send copies of their disks, comply by sending photocopies of them.

High-level executives aren't immune from following instructions too literally. A senior vice president of marketing called in a problem on a Saturday afternoon: "This darn thing says, 'Press f10 to continue.' I've pressed the F, the 1, and the 0 keys at least a dozen times, and nothing happens!"

A customer called a computer store and said, "I've read the book about DOS. Now what about the don'ts?"

Another person thought "take disk out of envelope" meant prying the magnetic medium from the black plastic, not taking the plastic from the sleeve.

This is not to say that users are totally at fault for these kinds of misunderstandings. As one contributor to this article wrote, "Why should we consider the use of a mouse to be intuitive or assume that someone using a word processor for the first time will know that his work will disappear if he pulls the power plug from the wall?"

That's Not What I Meant

People often take computer jargon literally. Who can blame them, when the terminology often has additional, more common meanings? One computer expert bumped into this problem when writing a memo in response to a request from 3M, asking him to explain why a certain company was having problems with disk failures.

His memo stated that the disks were failing because of head crashes, and counseled, "If the customers would just clean their heads periodically, they wouldn't have this problem."

To which the customer replied in all seriousness, "What kind of shampoo do you recommend we use?"

Disk Dilemma

Many problems stem from misunderstandings about the handling of disks.

One man who had problems with a backup called a technician, who discovered the man's disks were bent like half-moons. When the technician asked what had happened to them, the man said they always looked like that after he typed the labels on them.

One writer was told she should never write on the disk label with a ballpoint pen, so she used pencil and erased it each time she made a change. When the disk finally failed, she lost several chapters of her book. She had to rewrite them from notes and intermediate printouts.

Then there was the guy who couldn't figure out why his disks wouldn't work in his 3½-inch drive. He'd taken the larger 5¼-inch ones and trimmed them exactly to size.

Disk labels pose another problem. Not everyone realizes the label is supposed to fold over the back of the 3½-inch disk shell. One computerist had placed the label over the front side of the disk without folding it. It extended over the metal sleeve that has to slide open to access the disk itself. Another disk glitch has to do with loss of information. A woman wanted to make sure hers were safe, so she secured the disks to the side of her monitor—with magnets. Other office personnel have been known to keep their disks handy by hanging them on magnets stuck to the side of a filing cabinet.

Out of the Mouths of Babes

Sometimes it takes a child to make us realize how truly far we still have to go. One man who had just bought a 64 for his kids showed them a game which drew simple shapes on the screen. It used D for draw, M for move, C to change the color, and so on.

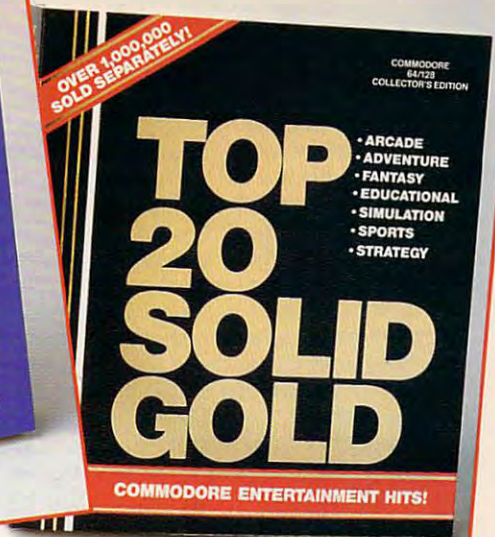
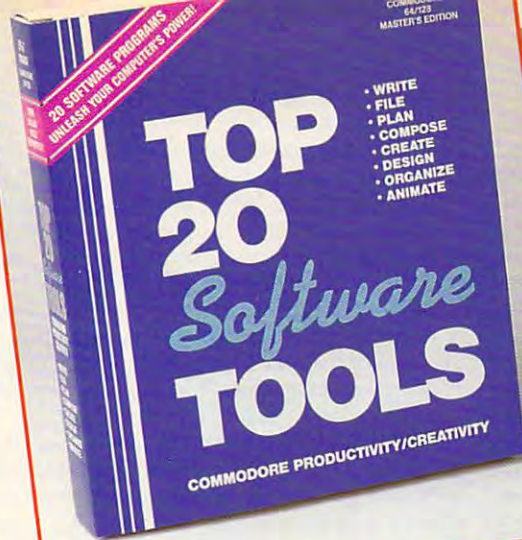
It may not be all that exciting for us, but the kids got a kick out of doing it. Imagine the man's surprise when he returned to where he had left his four-year-old son playing with the computer and saw a screen full of circles, squares, triangles, and colors, including some interesting geometric shapes that required options and functions that should've taken days to master. "Wow, that's great!" he said to the boy. "Show me how you did that!"

The young boy took hold of the keyboard with both hands and bashed his forehead into it several times.

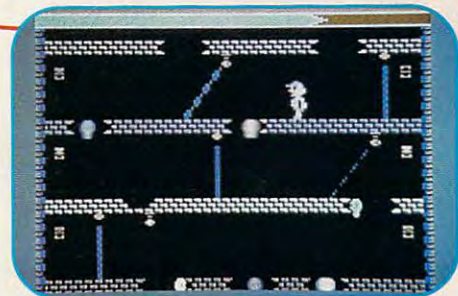
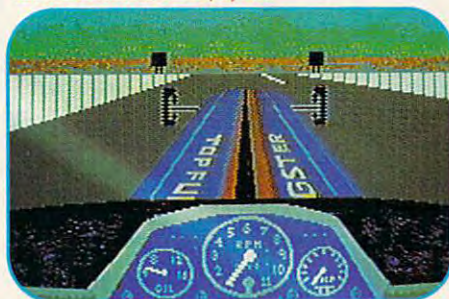
Journalistic Bloopers

Ah, the power of the media! The ability to disseminate information to millions of people can be heady stuff. Unfortunately, that power carries with it a danger as well. The wrong information sometimes slips through the system undetected—especially when comput-

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ers are used to file stories.

One journalist tells the story of a wire-service reporter in an Associated Press office who wrote a letter to her mother on the AP computer system. The letter was full of enthusiastic references to the neat new computers AP had just bought, followed by extremely disparaging remarks about the boss. She also included some comment about how you could type something there in the office and have it go from that computer to hundreds of media outlets.

Legend has it that, as you can guess, the letter was transmitted to every radio station in the state, and the author was fired. Now, AP apparently has a rule that no personal correspondence is allowed on its computers.

And speaking of radio stations, computers have been responsible for some interesting bloopers there, too. A couple of years ago, a newsman at a Seattle station read an erroneous headline over the air. It dealt with a senator who had been found naked and drunk outside a Washington, D.C., nightclub.

The headline was promptly retracted two minutes later. Apparently, a staffer who was about to resign from the station had put a set of fake headlines into the station's BASYS computer sys-

tem as a joke. Everyone thought the bogus headlines had been deleted, but a copy evidently appeared in the backup of the sports headline set.

Best—or worst—of all, among those listening to the radio broadcast at the time, in a car with his wife and family, was the senator himself.

Probably the most frequent computer glitch that afflicts reporters is losing portions of their work to the computer. There's the story of one newsman during the Carter administration who threw himself a little too much into covering the unveiling of the ephemeral Billy Beer. He returned to the newsroom after sampling more than a few bottles of the product, ready to input his magnum opus into the paper's computer.

After much fevered typing, he realized, two minutes to deadline, that he'd typed the entire story on a directory screen rather than saving it to a file. In his panic, he hit the Store button, which made the whole thing disappear forever. It's said that was the last time that particular reporter was ever sent to cover any event where alcohol was on the menu of items being served.

There are many ways to lose a story when working with computers. Another reporter spent an hour or so toiling over a long story without saving it to

disk. He leaned back in his chair and stretched, with his arms behind his head, and the chair went over backward. As the reporter tumbled, the toe of his shoe caught on the power cord and yanked it out of the wall. Good-bye, story.

Rumor has it that a certain Gazette editor has done a similar thing on more than one occasion by accidentally hitting the On/Off switch on the power strip beneath his desk.

Sometimes it's an external force that causes a user to lose work. One computerist recalls with woe an evening in his apartment when he'd been writing for four hours without saving. Just as he was about to hit the Return key to save his work, a drunken driver crashed into a pole outside the apartment, killing power to the building.

Experts Fall Victim

Even seasoned computer consultants goof up now and then. One admits to calling the repairman when his printer wouldn't print. He had it plugged into the wrong port. Another consultant once confused her modem and mouse cables.

A systems programmer beat on his machine for half an hour, screaming because it wouldn't work. Everything apparently checked out, but nothing appeared on his monitor. He had the contrast turned all the way down.

In the data-processing department of a hospital, someone thought it would be nice to have some sturdy canvas dust covers for the CRTs. Late one night, an employee was going to the snack bar and smelled something like burning electronics coming from that office. Luckily, there was no fire, but now the office staff knows it's a good idea to turn off a monitor before putting a dust cover over it for the night.

Try the Obvious

Sometimes the most obvious is the last thing tried. A computer consultant tells the story of a personnel clerk who called, explaining that her computer just showed a blank screen and wouldn't do anything. When he asked if the computer was turned on, she scolded him vehemently for impugning her integrity, informing him that she had graduated from a prestigious college and certainly had enough common sense to turn the computer on. Unfortunately, she didn't have enough common sense to plug it in.

Julia Wilkinson is a freelance writer and telecommunications junkie based in Virginia. She admits to making stupid mistakes frequently. □



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BACK TO THE FUTURE PART III

OK. So I don't play arcade games that often. To appeal to me, a game has to be really good. It has to entice me into it and make me want to continue playing. It has to be challenging enough so that I can't master it immediately, but it has to be masterable.

It has to have good sound, good graphics, and a clever plot line. If it's grounded in some other fiction or reality, such as a television show or current event, so much the better. The rules have to make a certain sense, and the program must create a reality of its own. This requires smooth programming. I want to be able to lose myself in the game, not get lost in its complexities. This is a tall order to be sure, but this is what a program needs if it's to attract me. Back to the Future Part III has what it takes.

One small confession: None of our test team, Dave and Robin (the adults) and Meaghan (the kid), was able to get past the first level of this game. We kept trying, but we couldn't get close enough to break the barrier into the second level. Of course, this means that there's a lot to the program we can't comment on. You can tell a lot about a game from its first level, however; it lets me know whether I want to play it or not.

Back to the Future Part III is based on key scenes from the movie of the same name. You don't have to have seen the movie to play, but the scenes and goals are much more meaningful if you have. In the movie, Marty McFly has to go back to 1885 where Doc has opted to live out the rest of his

days. Unfortunately, Marty has just discovered those days number only 3! So he's going to bring Doc back to the future.

Upon reaching 1885, Marty encounters Indians, a lovely schoolteacher, and bad guy Buford "Mad Dog" Tannen. Each of these encoun-



Doc must dodge Indians and other obstacles if he is to rescue Clara from a runaway buckboard that's heading for a ravine.

ters plays a part in our good guys' efforts to reach 1985.

The program takes four of the key turning points of the film as the basis of the four playing levels. Level 1 depicts the episode where Doc rescues schoolteacher Clara Clayton from the runaway buckboard before it falls into the ravine. As Doc, you try to catch the racing buckboard while galloping across rugged terrain and avoiding tumbling debris, crossfire between Indians and cavalrymen, and bank robbers.

Level 2 takes place at the celebration of the building of the clock tower where you—this time as Marty—take your turn at a newfangled shooting gallery.

Level 3 takes place later at the celebration when the bad guys are acting up and spoiling everyone's fun, espe-

cially Doc's. You (Marty) start spinning pie tins Frisbee-style at the bad guys.

Level 4 is the final run for the money. You must make your way over the roof of a moving train to supply it with enough of Doc's magic logs to get it up to the 88 mph necessary to send the De-

defeating. I always feel it's within my power to do better next time. Nothing is more frustrating than an arcade game that continually creams you, and a frustrating game is one no one wants to play for long.

One warning: Don't start this game in dim light. As copy protection, this program resorts to the trendy password printed in black on dark red paper. The print is hard to read if you have good vision and nearly invisible if you have any sort of eye trouble, particularly color blindness. There has to be a better way.

The manual is really good—probably the best combination of entertaining writing, background information, directions, and helpful hints I've seen with a program in a long time. The only thing I would add would be a listing of the maximum number of points you could accumulate at each level. This is because you can either concentrate on making a clean run (not losing a life), or you can try to make a clean run and rack up points. If you knew the maximum possible number of points, you'd know when to quit looking for point opportunities.

This brings up an interesting hitch we found. The manual tells you twice not to shoot the cavalry, but the game gives you points for doing so. I sense a subtlety here. The cavalry seems to act as a screen; the cavalrymen help to fight off the Indians and the bank robbers, giving you a little more room to maneuver. When you shoot them, you lose their help. On the other hand, I've been killed by as many cavalrymen as Indians, so. . . .

Of all the arcade games I've played, Back to the Future Part III is probably the

Lorean Time Machine back to the future!

I really appreciate the program's faithfulness to the film and the ingenuity used to adapt the situations to playable circumstances. I also have to compliment the graphics and the feel of the program. The horse on Level 1 is well drawn and graceful as it gallops across the screen. As you approach ditches and fallen suitcases, the anticipation is not unlike that of jumping a live horse. I even felt myself rise from my seat and lean forward with each jump.

Considering that my experience with arcade games isn't extensive, I suppose that what's challenging to me isn't nearly so much an obstacle to an avid player. Perhaps, but then this program gets progressively harder. What I like best is that it's not

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most fun. The pace is varied, not constantly and increasingly tense as some games are. Graphics and sound are excellent. It has humor, plot, and familiar characters. There's also something more. The game has an intangible personality of its own, something programs take on only when they're well crafted, tight, and uniformly good, which *Back to the Future Part III* is.

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GOOFY'S RAILWAY EXPRESS AND DONALD'S ALPHABET CHASE

As a mom and computer fan, I've long been satisfied with the 64's contribution to my children's education. From *Carmen Sandiego*, *World Geography*, *Scrabble*, and products from Davidson Educational Software, Commodore, and Fisher-Price on down to the Children's Television Workshop's *Sesame Street* series, there's been something at every level to keep my kids' eyes, hands, and minds glued to the computer, painlessly absorbing new concepts while being challenged in play.

Always looking for quality programs, I check out particular points when browsing. Is it attractive to my children? Does it make good use of the computer's capabilities? The 64 can manage both good graphics and good sound; a program that ignores this is too limited and

risks losing its audience. A program the kids won't use is useless. Does the program teach something specific, or can it expand my children's world? If it bears the label educational, the program had better do one of these; otherwise, it's entertainment masquerading as something else.

good friends? I'm happy to say that these programs fulfill my other requirements, too.

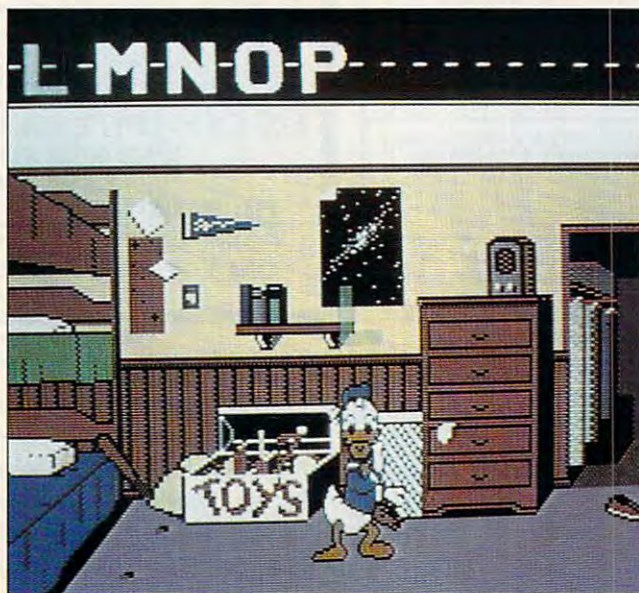
Geared for ages 2-5, these two games are an exploration of new worlds for preschoolers. In *Goofy's Railway Express*, Goofy and Mickey chug along the countryside in their train. Puffs of

time to change all the shapes on a screen. It takes several passes to catch all the shapes, thus holding the child's interest longer.

Goofy's graphics are excellently detailed, crisp, and entertaining. Sound effects are sprinkled throughout to good advantage. The interaction with the computer is kept simple—pressing the space bar—so that even the youngest child can handle this program in minutes. As children accompany Goofy and Mickey on their train ride, they learn how shapes make up the objects of our world.

Donald's *Alphabet Chase* allows children to play with the computer keyboard and experiment with recognizing letters. Donald's alphabet pets have escaped from his nephews' room and are running rampant throughout the house. He needs help catching them. When a child presses a letter, Donald goes to whatever room that letter is hiding in, waits until the letter leaves its hiding place, then picks it up and tosses it up to the top of the screen. When all the letters in a room are caught, the alphabet song plays.

The antics of these silly alphabet pets are delightful. Donald responds accordingly as they click the television on and off, stick their tongues out at him, and toss things out of the closet. There aren't a lot of sound effects, but the animation is terrific. In this game, the child is in control. Rather than asking the children to match the letters, Donald follows their directions and seeks out whatever letter they press. This allows them the freedom to explore the game and lets the parent guide children according to their abilities. Older children may be ready to



When a child presses a letter on the keyboard, Donald goes to his nephews' bedroom and other rooms to find the hiding letter.

As moms and dads the world over know, there are characters with universal appeal who have earned places in our children's Hearts of Fame. These friends include Bert and Ernie, Big Bird, Bugs Bunny, Mickey and Minnie Mouse, Goofy, and Donald Duck. Products associated with any of these characters have guaranteed attraction and appeal, but are they worthwhile on other counts?

Goofy's *Railway Express* and Donald's *Alphabet Chase* are two products from Disney Software that automatically fulfill the first requirement of child appeal. Who could resist Mickey's

smoke issue from the smokestack in all sorts of shapes. Children press the space bar to toot the whistle whenever they want to see a shape used to make a real object. In one sequence a triangle becomes a teepee; in another, it becomes a sailboat. These objects briefly become an animated part of the scenery.

Meanwhile, Goofy's train chugs on, passing through four different screens to his destination. There he reverses direction and heads back, the engine huffing and puffing more smoke shapes. Because the sequences take a little time and the train keeps moving, there isn't

locate a particular letter, while younger ones may select a letter and have Mom or Dad tell them what it is while Donald catches it.

Although these games are for the same age group, I found that, in our household, Goofy appealed more to 5-year-old Katie, who was ready to seek out the geometric shapes and the objects created from it, while Donald won over 3-year-old Michael, who laughed at the letters and sang along with the alphabet song. A lot depends on the child, naturally, but these programs work for the age group that Disney claims they will.

Disney recommends that you back up disks—an especially smart move for children's programs. There's no problem doing this since Disney's copy protection doesn't depend on the disk. Instead, at the beginning of each program you're asked to match and identify a graphic with one that appears on a sheet that accompanies the program.

Herein lies my sole complaint about these programs. Disney has printed this sheet with black ink on very dark reddish brown paper. Text is hard to read, and the graphics are difficult to see. The only reason I can see for making this so dark is so that it cannot be photocopied. My guess is borne out by the fact that Disney charges \$15 to replace a lost sheet. It will replace a damaged one free of charge, provided you send the pieces. While I hold no truck with pirating, making the sheet almost unreadable isn't the answer.

The process of creating and developing characters of the magnitude of Mickey Mouse and his companions carries a certain amount of responsibility. Any products that use these images should be closely scrutinized before they're placed on the market. Such products should be of high quality so as not to betray the trust of these characters' loyal following. As a rule, Disney is careful to meet this responsibility. It didn't let us down this time either.

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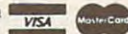
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Visible Sound Waves

This 64 program dynamically graphs the triangular waveform produced by the SID chip's Voice 3. To see Voice 3 in action, plug a joystick into port 2, and then type in and run the following listing.

```
AC 100 FOR I=679 TO 739:READ D
      :POKE I,D:C=C+D:NEXT
MP 110 IF C<>7677 THEN PRINT "
      ERROR IN DATA STATEMENT
      S":STOP
PD 120 DATA 162,0,160,0,169,50
      ,133,2,173,27,212,141,0
      ,208,173,18,208,141
FX 130 DATA 1,208,198,2,208,24
      0,173,0,220,201,126,208
      ,13,232,208,1,200,142
SH 140 DATA 14,212,140,15,212,
      76,171,2,201,125,208,21
      2,202,208,1,136,142,14
AC 150 DATA 212,140,15,212,76,
      171,2
SJ 160 PRINT CHR$(147):POKE 53
      280,0:POKE 53281,0
SJ 170 FOR I=54272 TO 54296:PO
      KE I,0:NEXT
RA 180 POKE 54296,15:POKE 5429
      1,190:POKE 54292,248:PO
      KE 54290,17
ES 190 FOR I=832 TO 894:POKE I
      ,255:NEXT
RA 200 POKE 2040,13:V=53248:PO
      KE V+21,1:POKE V+39,2:P
      OKE V,24:POKE V+1,100
XK 210 POKE 56333,127:SYS 679
```

Move the joystick up or down to change the pitch of the sound. For best visual results, tune the sound to a low pitch. When the frequency is low enough, you will see one large triangular waveform on your monitor screen. As you increase the frequency, the number of waveforms per screen increases. High-frequency tones oscillate faster than your monitor can handle, but they'll often lock into place like Lisajous patterns on an oscilloscope.

This program uses a single sprite to plot Voice 3's waveform. You might be interested to know that the machine language for the sprite-plotting code is only 15 bytes long.

```
LOOP LDA 54299
      STA 53248
      LDA 53266
      STA 53249
      JMP LOOP
```

RICHARD PENN
MONTREAL, PQ
CANADA

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BEGINNER BASIC

Larry Cotton

CHECK YOUR BANK'S MATH

Recently, I decided to run an amortization schedule on my 13-year-old home mortgage loan to see if it agreed with the bank's schedule. I wanted to see how each month's payment was apportioned to principal and interest. I also wanted to check the bank's math. Most importantly, I was interested in the balance due.

There's a certain satisfaction that comes from writing your own program while honing your BASIC skills. Let's write a simple program that does what we need. We'll start with white characters on a blue screen.

```
10 POKE53280,6:POKE646,1:
GOTO30
```

GOTO30 sends control around a subroutine in the next line, which appears early in the program to speed printing the screen. Here's the subroutine, which we'll discuss in a moment.

```
20 PRINTTAB(T1)N TAB(T2)J
TAB(T3)B:RETURN
```

Set C to 12 (more about that later) and define the tab stops to locate information in four columns on the screen. Remember that the leftmost screen position is TAB(0) and that positive numbers include a leading space.

```
30 C=12:T1=5:T2=16:T3=27
```

Rounding to dollars and cents requires two constants, 100 and .5.

```
40 H=100:D=.5
```

The next three lines gather user input and check for values less than zero. If any are found, the program just runs

from the beginning.

```
50 INPUT“(CLR){DOWN}AMOUNT
OF LOAN”;B:IFB=<0THENRUN
60 INPUT“(DOWN)ANNUAL
INTEREST RATE”;AI:I=AI/1200:
IFI=<0THENRUN
70 INPUT“(DOWN)NO. OF YEARS
ON LOAN”;Y:M=Y*12:
IFM=<0THENRUN
```

B is the amount of the loan (later, balance). Line 60 also converts annual interest rate AI to its monthly decimal equivalent I; line 70 also converts years Y to months M.

Line 80 uses the above information plus rounding constants H and D to calculate the monthly payment. The formula uses a monthly payment schedule and won't work with any other payment interval.

```
80 P=(INT(H*B*(I+1)/((I+1)^M-
1))+D)/H
```

Line 90 prints the result of the calculation.

```
90 PRINT“(DOWN)MONTHLY
PAYMENT SHOULD BE $”;P
```

If you're evaluating an existing loan and this isn't your actual payment, you have an opportunity to change it.

```
100 PRINT“(DOWN)(PRESS
RETURN TO USE ABOVE PAY
MENT)”
110 INPUT“(DOWN)ACTUAL
PAYMENT”;AP$:IFAP$=""
THEN130
120 P=VAL(AP$)
```

Offer the option of seeing a monthly or yearly picture.

```
130 PRINT“(DOWN)SEE MONTHLY
OR YEARLY (M/Y)?”
140 GETA$:IFA$<>“Y” THEN
IFA$<>“M”THEN140
```

Here's the heading of the screen-printing routine, which uses the tab stops defined in line 30.

```
150 PRINT“(CLR)”
160 PRINT“(HOLD SPACE BAR TO
SEE ENTRIES)”
170 PRINT“(DOWN) MO.”
TAB(T1)“ PRINCIPAL”
TAB(T2)“
INTEREST”TAB(T3)“ BAL
ANCE”
180 PRINT“(1 SPACE){38 -)”
```

Now we must calculate and print the monthly dollar amounts applied to interest and principal and the principal balance. For this we use a month counter, Q.

```
190 Q=Q+1
```

Just after starting the counter, we check to see if the space bar has been pressed, which causes the calculated values to be printed. (To examine a line, release the space bar.)

```
200 GETB$:IFB$<>“(
1 SPACE)”THEN200
```

The three calculations are as follows.

```
210 J=INT((I*B)*H+D)/H
220 N=INT((P-J)*H+D)/H
230 B=INT((B-N)*H+D)/H
```

Pay close attention now. J (the portion of payment applied to interest) is monthly interest times principal balance, N (the portion of payment applied to principal) is the payment less interest, and B (the new principal balance) is the old balance less the portion of payment applied to principal.

Quickly, check to see if the balance has become less than zero.

```
240 IFB<0THENEND
```

Now we check the response from line 140 to see if we want to print a monthly or yearly picture. If monthly, our subroutine at line 20 kicks in after every calculation to print

Write an amortization program to see if your figures agree with the bank's schedule.

month Q and the other variables N, J, and B. If yearly, the line 20 subroutine is used only once every 12 calculations.

```
250 IF A$="M" THEN
    GOSUB 20:GOTO 270
260 IF INT(Q/C)=Q/CTHEN
    GOSUB 20
```

Line 260 shows an interesting way to count by any value C. (C is equal to 12 in this program, as defined in line 30.) Q/C will always result in a decimal value except when Q is evenly divisible by C. If the balance on the loan is still greater than 0, then we return control of the program to line 190.

```
270 GOTO 190
```

When the amortization schedule has finished printing, we print the headings again, but in reverse order.

```
280 PRINT "{1 SPACE}{38 -}"
290 PRINT "{DOWN} MO."
    TAB(T1) " PRINCIPAL" TAB
    (T2) " INTEREST" TAB(T3) "
    BALANCE"
```

To use the program, enter the amount of the loan after any down payment (don't use commas); the annual interest rate, such as 8.5 or 10; and the number of years the loan runs. The program usually will not work with illogical values supplied.

If the calculated payment is OK, just press Return at the next question. If not, enter another payment. A payment greater than that calculated will reduce the term of the loan and vice versa; the program will end when the loan balance is less than zero.

Pressing the space bar causes the values to be displayed on either a monthly or yearly basis. Release the space bar to halt the listing.



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Steve Vander Ark

GOING WILD ABOUT FONTS

The first GEOS article I ever had published was about fonts. That was a few years ago, and since so many things have changed in the GEOS world since those days, I thought I'd attack the subject again. After all, fonts are one of the more exciting aspects of using GEOS.

To see fonts in action, just boot up your copy of geoWrite. This word processor allows for just about any kind of expressive font you can imagine. When it comes to desktop publishing, there is even more excitement on hand. GeoPublish takes fonts a step further by introducing MegaFonts and allowing you to smooth and scale your fonts.

There are literally hundreds of fonts available from various sources. In addition to FontPack Plus and International FontPack from GeoWorks, font collections from Susan Lamb (3575 East County 18th Street, Yuma, Arizona 85365), and Jim Collette's collections (6782 Junction Road, Pavilion, New York 14525-9755), there are more public domain fonts around than you can count. Parsec (P.O. Box 111, Salem, Massachusetts 01970) has released a huge collection of public domain fonts along with an 80-page booklet giving examples of each one (\$24.95 plus \$2.90 shipping and handling U.S., \$7.50 Canada). The booklet and disks put more than 550 fonts at your fingertips.

One of the prerequisites for being able to use fonts effectively is knowing when to use them. Fonts can be separated into three categories, depending on how they're used. Those that look good in large bodies of text are called body fonts. These fonts are very

readable. They're a best bet for correspondence or as the text of a newsletter. Examples of body fonts are Roma, University, Wheeler, and Haste.

Headline fonts are more decorative and have much more character. They grab a reader's attention, but they seldom work well in large sections of text. Their frills can confuse the reader's eye. Fonts such as America, Kensington, and Telegraph are usually larger in size, which is in keeping with their function: creating headlines and other short sections of text. Headline fonts, carefully selected, can give your document extra impact.

The third type of font is the specialty font, including picture fonts like Ashby or Wurster. These fonts have limited value in geoWrite but make excellent miniphoto collections for geoPaint or geoPublish.

It's fun to collect fonts, but keeping them straight can be confusing. It can be especially frustrating if you're scanning lists of fonts by name, trying to recall what each one looks like. The easiest way to keep track of different fonts is to maintain printouts of each one. Such printouts or samples are included with commercial packages like FontPack Plus, but for the most part, you'll have to make your own. A utility by Joe Buckley called Font Dump will handle the job for you; you can download it from Q-Link. Its filename is FONT DUMP 3. SFX, uploaded by Red Storm.

If you need to check out a font on the fly, however, use FontView. This utility is from RUN magazine's GEOS Power Pack II disk (80 Elm Street, Peterborough, New Hampshire 03458). FontView displays any font you select from either drive and allows you to add style effects, such as italics and boldface.

Another clever way to organ-

ize fonts is to change the icon of each to the letter F from the actual font. A file of such icon images is available on Q-Link (FNTPK+ICONS, uploaded by LadyCarmen), which includes icons for most of the fonts on FontPack Plus. You'll need an icon editor, however, to make the switch.

Each font has an individual ID number, which applications use to identify the fonts in your documents. You can also identify fonts within a file or on a disk by these numbers using Identifont, a program written by Dennis Seitz of Berkeley, California.

If the font numbers it encounters correspond to known GEOS fonts (in other words, the ones on the system disks), it'll give you the font names; otherwise, it simply lists the font ID numbers. If you've kept a list of the numbers with your different printouts, you can cross-reference the various fonts yourself.

OK, you don't keep such good records. Neither do I. That's why I always appreciate a utility that takes care of those kinds of niggling little jobs for me. That's where Jim Collette's program called Font Editor 2.5 comes in.

Yes, it's a font editor, but it's easily the best of the bunch. It's loaded with every feature you could want. It'll create megafonts, allow you to scale fonts to different point sizes or widths, and even allow you to save a point size from one font into that size in another font.

To organize the whole mess, Font Editor will also print out the font along with the name, point size, and ID number. This handy program pretty much takes care of all the font needs any GEOS user could ask for. It's available from CommPlex Software for \$21.50. (See Collette's address above.) □

Fonts are one of the more exciting aspects of using GEOS.

PROGRAMS

MILK RUN

By Gus Vakalis

Milk Run is a fast-paced two-player arcade game with animated characters and a scrolling playing field. The object of the game is to deliver milk to the customers on your route. Getting the milk bottles right on the doorstep is tough enough, but you must also contend with angry dogs who chase you and an opponent who tosses milk bottles at you.

Typing It In

Although Milk Run is written entirely in machine language, it loads and runs like a BASIC program. To type it in, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following values.

Starting address: 0801

Ending address: 1F98

Be sure to save the program to disk before you exit MLX.

Deliver the Milk

After you load and run the program, you'll be taken immediately to the title screen. From there, press the space bar to start the game.

Player 1, using joystick 1, delivers milk to the houses on the left-hand side of the road, and player 2 uses joystick 2 to deliver to the houses on the right-hand side. You must deliver milk to each house with a white porch as it comes scrolling past.

Press the fire button to launch a milk bottle in the direction that the joystick points. Try to toss the bottles to land right at the white door. Failing to do so will cost you that customer, and that porch will turn red. A counter at the top of the screen indicates how many customers each player has remaining. You'll earn 100 points for each successful delivery, and those customers will continue their patronage for another round.

Occupational Hazards

Just doing your job is not enough to win this game. You also have to worry about the competition. You and your opponent can toss milk bottles in any direction, even at each other. If you're

struck by your opponent's milk bottle, you'll lose 500 points. Dogs are another nuisance. If you're bitten by a dog, you'll lose 1000 points.

You can stop your opponent's milk bottle or a charging dog by throwing your milk bottles at them. Since you can have only one bottle in the air at a time, however, saving yourself from these threats can cost you one or more customers.

There are five levels to the game, with each level having as many dog attacks as the level number. That is, there will be one dog attack at level 1, two at level 2, and so on.

Top Employee

At the end of the fifth level or at the end of any level in which a player has lost all of his customers, an Employee of the Month board will appear, praising the winner. The winner will be the player with the highest score and not the player with the most remaining customers. So it's possible to lose all of your customers and still win the game.

Key Keys

At the bottom of the screen, you'll find a red key bar indicating the keys that are active and their functions. Pressing the Q key at any time during the game will exit the game and return you to BASIC. Pressing Run/Stop will pause the game, and pressing it again will continue the action. The Restore key will terminate the game and reset it to the beginning so you can play again.

MILK RUN

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0801:0B 08 0A 00 9E 32 30 36 2E
0809:31 00 00 00 78 A5 01 29 37
0811:FB 85 01 A2 00 BD 00 D8 9A
0819:9D 00 38 BD 00 D9 9D 00 7D
0821:39 BD 00 DA 9D 00 3A BD 0A
0829:00 DB 9D 00 3B BD 00 DC 91
0831:9D 00 3C BD 00 DD 9D 00 26
0839:3D BD 00 DE 9D 00 3E BD 6C
0841:00 DF 9D 00 3F E8 D0 CD 0A
0849:A5 01 09 04 85 01 AD 14 6D
0851:03 8D 8F 10 AD 15 03 8D 8E
0859:90 10 AD 18 03 8D 91 10 6E
0861:AD 19 03 8D 92 10 AD 28 20
0869:03 8D 93 10 AD 29 03 8D 77
0871:94 10 A9 FF 8D 8A 10 A9 65
0879:06 8D 8B 10 8D 06 14 A9 B8
0881:3C 8D 05 14 A9 01 8D 96 F7
0889:0F 8D D1 0F A9 D2 8D 14 77
0891:03 A9 0F 8D 15 03 A9 FA 4B
0899:8D 28 03 A9 F6 8D 29 03 B8
08A1:A9 EC 8D 18 03 A9 14 8D 69
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08A9:19 03 A9 00 8D 8C 10 8D 88
08B1:8D 10 8D F4 14 8D 8E 10 91
08B9:8D 95 0F 8D D0 0F 58 A2 C6
08C1:00 BD 18 1D 9D 80 35 BD 2D
08C9:B8 1D 9D 20 36 BD 58 1E AA
08D1:9D C0 36 BD F8 1E 9D 60 5F
08D9:37 E8 E0 A0 D0 E3 A2 00 41
08E1:BD 18 1B 9D D8 3A E8 E0 76
08E9:C8 D0 F5 A2 00 BD E8 19 5D
08F1:9D D8 38 E8 E0 10 D0 F5 7B
08F9:A2 00 BD F8 19 9D 80 39 1C
0901:E8 E0 50 D0 F5 A2 00 BD CE
0909:48 1A 9D 08 3A E8 E0 D0 02
0911:D0 F5 A2 00 BD E0 1B 9D A2
0919:C0 3B E8 E0 C8 D0 F5 A2 9D
0921:00 BD C0 1C 9D 08 3E E8 EE
0929:E0 08 D0 F5 A2 00 BD C8 80
0931:1C 9D 28 3E E8 E0 08 D0 4D
0939:F5 A2 00 BD D0 1C 9D 48 45
0941:3E E8 E0 08 D0 F5 A2 00 EC
0949:BD D8 1C 9D 70 3E E8 D0 FC
0951:40 D0 F5 A9 FF 8D 6B 3D 5B
0959:8D 79 3D A9 81 8D 6C 3D 2B
0961:AD 18 D0 29 F0 09 0E 8D 52
0969:18 D0 A9 FF 8D 8A 10 20 C7
0971:49 0F 20 5A 0F 20 39 0F 10
0979:A9 00 8D 09 14 8D F4 14 77
0981:8D 46 14 8D 47 14 8D 54 41
0989:11 8D C1 12 8D 03 14 8D 0F
0991:04 14 8D 8C 10 8D 8D 10 07
0999:A9 40 8D A9 0E 8D AA 0E E6
09A1:A9 31 8D 9C 0A 8D 68 18 BF
09A9:A9 01 8D 07 14 8D 08 14 ED
09B1:A9 00 AA 9D 28 13 E8 E0 08
09B9:06 D0 F8 A9 80 8D 91 02 1C
09C1:A9 93 20 D2 FF A9 06 8D FE
09C9:20 D0 A9 00 8D 21 D0 A9 91
09D1:C8 8D E2 0D A9 04 8D E3 35
09D9:0D A9 00 8D E4 0D 8D E6 13
09E1:0D A9 00 8D B7 0D A9 0E 11
09E9:8D E5 0D 20 59 0D 20 7C 97
09F1:0E 20 AC 0E 20 18 0C A9 AC
09F9:00 8D 8A 10 A2 8C A0 FF 4A
0A01:88 D0 FD CA D0 F8 20 39 DD
0A09:0D 20 B8 0D AD B7 0D C9 C3
0A11:F0 D0 03 4C 30 0A CE E3 22
0A19:0D AD E3 0D 03 20 E7 27
0A21:0D CE E5 0D AD E5 0D D0 EC
0A29:D3 20 15 0E 4C FD 09 A9 C8
0A31:10 8D 6A 0A CE E5 0D AD 74
0A39:E5 0D D0 03 20 15 0E A2 E1
0A41:F8 A0 FF 88 D0 FD CA D0 B2
0A49:F8 20 39 0D CE 6A 0A F0 FE
0A51:15 CE E5 0D AD E5 0D D0 21
0A59:E6 AD 6A 0A C9 03 90 DF 95
0A61:20 15 0E 4C 40 0A 4C 6B 7F
0A69:0A 00 A2 FF A0 FF 88 D0 BD
0A71:FD CA D0 F8 AD A9 0E F0 02
0A79:23 AD AA 0E F0 1E EE 9C 3B
0A81:0A AD 9C 0A C9 3E F0 14 57
0A89:8D 68 18 29 0F 8D 07 14 E4
0A91:8D 08 14 A9 00 8D 09 14 E7
0A99:4C D0 09 00 A9 0F 8D 8A 1C
0AA1:10 20 49 0F 18 A2 04 A0 D3
0AA9:08 20 F0 FF A2 00 BD B1 2A
0AB1:15 20 D2 FF E8 E0 E3 D0 16
0AB9:F5 A0 00 B9 28 13 D9 2B F8
0AC1:13 F0 04 B0 0A 90 0B C8 98
0AC9:C0 03 D0 EF 4C D6 0A 4C 36
0AD1:49 0B 4C 82 0B A0 00 B9 93
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PROGRAMS

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0AD9:28 13 D0 1D C8 C0 03 D0 D2
0AE1:F6 18 A2 07 A0 08 20 F0 92
0AE9:FF A2 E0 BD 94 16 20 D2 92
0AF1:FF E8 E0 42 D0 F5 4C B8 30
0AF9:0B 18 A2 07 A0 08 20 F0 B4
0B01:FF A2 00 BD 5E 17 20 D2 FD
0B09:FF E8 E0 47 D0 F5 A0 00 89
0B11:A2 00 B9 28 13 4A 4A D2
0B19:4A 09 30 9D 4A 05 B9 28 78
0B21:13 29 0F 09 30 9D 4B 05 11
0B29:B9 2B 13 4A 4A 4A 09 07
0B31:30 9D 56 05 B9 2B 13 29 AB
0B39:0F 09 30 9D 57 05 E8 E8 82
0B41:C8 C0 03 D0 CD 4C B8 0B 75
0B49:18 A2 07 A0 08 20 F0 FF A1
0B51:A2 00 BD D6 16 20 D2 FF B4
0B59:E8 E0 44 D0 F5 A0 00 A2 86
0B61:00 B9 28 13 4A 4A 4A 76
0B69:09 30 9D 50 05 B9 28 13 3B
0B71:29 0F 09 30 9D 51 05 E8 29
0B79:E8 C8 C0 03 D0 E3 4C B8 E5
0B81:0B 18 A2 07 A0 08 20 F0 3E
0B89:FF A2 00 BD 1A 17 20 D2 64
0B91:FF E8 E0 44 D0 F5 A0 00 E1
0B99:A2 00 B9 2B 13 4A 4A 8B
0BA1:4A 09 30 9D 50 05 B9 2B 34
0BA9:13 29 0F 09 30 9D 51 05 A5
0BB1:E8 E8 C8 C0 03 D0 E3 AD 6C
0BB9:8E 10 F0 03 4C C8 0B AD B2
0BC1:F4 14 F0 F3 4C 6B 09 20 F6
0BC9:49 0F A9 C0 8D 1B D4 8D 8D
0BD1:15 D0 85 C6 3D 91 02 AD 28
0BD9:18 D0 29 F0 09 04 8D 18 EF
0BE1:D0 A9 06 8D 21 D0 A9 0E 12
0BE9:8D 20 D0 8D 86 02 78 AD 9C
0BF1:8F 10 8D 14 03 AD 90 10 C6
0BF9:8D 15 03 AD 91 10 8D 18 57
0C01:03 AD 92 10 8D 19 03 AD DD
0C09:93 10 8D 28 03 AD 94 10 2B
0C11:8D 29 03 58 4C 94 E3 AD 4A
0C19:9C 0A C9 31 F0 01 60 18 B2
0C21:A2 04 A0 08 20 F0 FF A2 87
0C29:00 BD F5 14 20 D2 FF E8 E5
0C31:E0 BC D0 F5 A5 C5 C9 3E 78
0C39:F0 19 C9 3C D0 F6 20 B6 66
0C41:0C A5 C5 C9 40 D0 FA A9 03
0C49:00 8D 8C 10 8D 8D 10 8D A7
0C51:F4 14 60 68 68 4C C8 0B 8C
0C59:18 A2 00 A0 00 20 F0 FF 92
0C61:A2 00 BD A5 17 20 D2 FF BB
0C69:E8 E0 84 D0 F5 18 A2 16 37
0C71:A0 01 20 F0 FF A2 00 BD 75
0C79:29 18 20 D2 FF E8 E0 7D 40
0C81:D0 F5 A9 02 8D E7 DB A9 42
0C89:0A 8D E7 07 A9 03 8D 51 88
0C91:D8 8D 52 D8 A9 04 8D 75 3F
0C99:D8 8D 76 D8 A2 00 A9 1B 61
0CA1:9D 78 04 A9 1C 9D 48 07 B0
0CA9:A9 06 9D 78 D8 9D 48 DB FC
0CB1:E8 E0 28 D0 E9 A9 00 85 45
0CB9:F7 85 F9 A9 04 85 F8 A9 DA
0CC1:D8 85 FA A0 00 B9 A6 18 5D
0CC9:91 F7 20 FA 0C 91 F9 C8 BF
0CD1:C0 28 D0 F1 18 A5 F7 69 3E
0CD9:28 85 F7 A5 F8 69 00 85 B3
0CE1:F8 18 A5 F9 69 28 85 F9 C1
0CE9:A5 FA 69 00 85 FA C9 DB 48
0CF1:D0 D1 A5 F9 C9 48 D0 CB 18
0CF9:60 C9 63 F0 32 C9 64 F0 A2
0D01:2E C9 6D 90 1B C9 6F 90 CA
0D09:1A C9 6F F0 19 C9 72 90 05
0D11:18 C9 74 90 1D C9 78 90 D2
0D19:1C C9 A0 F0 0F A9 00 60 56
0D21:A9 08 60 A9 04 60 A9 0C B9
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0D31:02 60 A9 01 60 A9 07 60 C1
0D39:A9 F8 85 F7 85 FB A9 06 0C
0D41:85 F8 A9 20 85 F9 85 FD B0
0D49:A9 07 85 FA A9 DA 85 FC 1B
0D51:A9 DB 85 FE A0 00 AD 8E C6
0D59:10 F0 05 68 68 4C C8 0B EF
0D61:AD F4 14 F0 05 68 68 4C 08
0D69:6B 09 AD 8C 10 D0 E7 B1 3F
0D71:FB 91 FD B1 F7 91 F9 C8 8B
0D79:C0 28 D0 DA A5 FB 85 FD EB
0D81:A5 FC 85 FE A5 F7 85 F9 60
0D89:A5 F8 85 FA 38 A5 F7 E9 47
0D91:28 85 F7 A5 F8 E9 00 85 6F
0D99:F8 38 A5 FB E9 28 85 FB A9
0DA1:A5 FC E9 00 85 FC A5 F7 6E
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0DB9:E2 D0 A2 00 B9 A6 18 9D 13
0DC1:A0 04 20 FA FC 9D A0 D8 D1
0DC9:C8 E8 E0 28 D0 EE 38 AD 81
0DD1:E2 D0 E9 28 8D E2 D0 C9 3C
0DD9:D8 D0 05 A9 C8 8D E2 D0 1F
0DE1:60 00 00 00 00 00 A9 06 85
0DE9:8D E3 D0 AC E4 D0 B9 96 95
0DF1:19 29 F0 F0 0A A9 01 8D 96
0DF9:A3 D8 A9 72 8D A3 04 B9 35
0E01:BE 19 29 F0 F0 0A A9 01 FA
0E09:8D C4 D8 A9 73 8D C4 04 32
0E11:EE E4 D0 60 A9 06 8D E5 EB
0E19:0D AC E6 D0 B9 96 19 2C 1B
0E21:AB 0E F0 26 29 0F D0 1D 5B
0E29:A9 00 99 96 19 A9 02 8D B7
0E31:33 DA A9 96 18 D 33 06 F8 47
0E39:38 AD A9 0E E9 01 8D A9 0B
0E41:0E D8 4C 4B 0E A9 F0 99 6B
0E49:96 19 B9 BE 19 2C AB 0E F8
0E51:F0 26 29 0F D0 1D A9 0E D3
0E59:99 BE 19 A9 02 8D 54 DA 79
0E61:A9 64 8D 54 06 F8 38 AD 94
0E69:AA 0E E9 01 8D AA 0E D8 B7
0E71:4C 79 0E A9 F0 99 BE 19 F2
0E79:EE E6 D0 AD A9 0E 4A 4A A7
0E81:4A 4A 09 30 8D 51 04 AD E0
0E89:A9 0E 29 0F 09 30 8D 52 8A
0E91:04 AD AA 0E 4A 4A 4A 4A AB
0E99:09 30 8D 75 04 AD AA 0E 89
0EA1:29 0F 09 30 8D 76 04 60 E8
0EA9:00 00 F0 A9 00 8D 15 D0 AF
0EB1:8D 10 D0 A9 D0 8D F8 07 6B
0EB9:A9 DF 8D F9 07 A9 09 8D 72
0EC1:27 D0 8D 28 D0 A9 33 8D FA
0EC9:1C D0 A9 01 8D 25 D0 A9 B9
0ED1:06 8D 26 D0 A9 80 8D 00 90
0ED9:D0 A9 9A 8D 01 D0 A9 8D 6C
0EE1:8D 02 D0 A9 9A 8D 03 D0 DB
0EE9:A9 D9 8D FA 07 A9 D6 8D CC
0EF1:FB 07 A9 01 8D 29 D0 8D 53
0EF9:2A D0 A9 78 8D 04 D0 A9 E3
0F01:94 8D 05 D0 A9 E3 8D 06 78
0F09:D0 A9 94 8D 07 D0 A9 DB 10
0F11:8D FC 07 A9 DA 8D FD 07 C0
0F19:A9 09 8D 2B D0 8D 2C D0 98
0F21:A9 81 8D 0B D0 A9 C8 8D F2
0F29:09 8D 8D 0B D0 A9 D9 8D D0
0F31:0A D0 A9 33 8D 15 D0 60 B3
0F39:A2 00 A9 F0 9D 96 19 9D 04
0F41:BE 19 E8 E0 28 D0 F5 60 01
0F49:A2 00 8A 9D 00 D4 E8 E0 E9
0F51:18 D0 F8 A9 0F 8D 18 D4 1D
0F59:60 20 49 0F A9 FF 8D 0E 40
0F61:D4 8D 0F D4 A9 80 8D 12 F8
0F69:D4 60 AD 95 0F 49 FF 8D 44
0F71:95 0F F0 15 A9 95 8D 01 4D
0F79:D4 A9 30 8D 06 D4 A9 81 A3
0F81:8D 04 D4 A9 01 8D 96 0F 17
0F89:60 A9 00 8D 04 D4 A9 04 E5
0F91:8D 96 0F 60 00 00 AD 03 62
0F99:14 D0 08 AD 04 14 D0 03 E6
0FA1:4C C3 0F AD D0 0F 49 FF E8
0FA9:8D D0 0F F0 15 A9 B5 8D FB
0FB1:08 D4 A9 30 8D 0D D4 A9 35
0FB9:81 8D 0B D4 A9 01 8D D1 E8
0FC1:0F 60 A9 00 8D 0B D4 A9 A0
0FC9:03 8D D1 0F 60 00 00 00 FA
0FD1:00 A5 C5 C9 3E D0 08 A9 9D
0FD9:FF 8D 8E 10 4C 31 EA AD D8
0FE1:8A 10 F0 03 4C 31 EA AD 42
0FE9:8D 10 F0 0B A5 91 C9 7F 28
0FF1:F0 26 A9 00 8D 8D 10 A5 AF
0FF9:91 C9 7F D0 1B AD 8C 10 09
1001:49 FF 8D 8C 10 A9 00 8D F4
1009:04 D4 8D 95 0F 8D 0B D4 05
1011:8D D0 0F A9 FF 8D 8D 10 0A
1019:AD 8C 10 F0 03 4C 31 EA DA
1021:20 9E 13 20 95 10 20 FD 88
1029:11 20 C3 12 20 48 14 CE 8C
1031:96 0F D0 03 20 6B 0F CE 46
1039:D1 0F D0 03 20 97 0F CE 9C
1041:8B 10 F0 03 4C 31 EA A9 20
1049:06 8D 8B 10 AD F8 07 49 EA
1051:01 8D F8 07 AD F9 07 49 91
1059:01 8D F9 07 AD FC 07 49 C5
1061:01 8D FC 07 AD FD 07 49 32
1069:01 8D FD 07 AD FA 07 C9 CE
1071:D6 F0 09 CE FA 07 EE FB 15
1079:07 4C 31 EA A9 D9 8D FA CF
1081:07 A9 D6 8D FB 07 4C 31 09
1089:EA 00 00 00 00 00 00 00 1F
1091:00 00 00 00 AD 54 11 F0 83
1099:5A AD 55 11 4A B0 06 4A 79
10A1:B0 0E 4C D8 10 CE 04 D0 49
10A9:AD 04 D0 C9 2C F0 41 60 0B
10B1:EE 04 D0 AD 04 D0 C9 D4 00 60
10B9:F0 08 AD C2 12 C9 02 F0 E2
10C1:07 60 20 56 11 4C F1 10 94
10C9:AD 04 D0 CD 06 D0 B0 01 8E
10D1:60 20 DF 11 4C F1 10 EE 70
10D9:05 D0 AD 05 D0 C9 C8 F0 E6
10E1:0F CD 09 D0 90 14 A9 C8 1C
10E9:8D 09 D0 A9 00 8D 03 14 18
10F1:20 C4 11 AD 01 CD 29 10 2E
10F9:F0 01 60 AD 01 DC 29 0F 96
1101:38 E9 0F 4A B0 09 4A B0 2F
1109:2A 4A B0 03 4A B0 12 A9 FB
1111:01 8D 55 11 A9 78 8D 04 21
1119:D0 A9 94 8D 05 D0 4C 46 C3
1121:11 A9 02 8D 55 11 A9 8B 1D
1129:8D 04 D0 A9 94 8D 05 D0 7D
1131:4C 46 11 A9 04 8D 55 11 D9
1139:A9 82 8D 04 D0 A9 94 8D A6
1141:05 D0 4C 46 11 AD 15 D0 42
1149:09 04 8D 15 D0 A9 FF 8D AE
1151:54 11 60 00 00 AD 2B 13 0E
1159:D0 0E AD 2C 13 29 F0 D0 CF
1161:07 AD 2C 13 C9 06 90 14 C4

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1169:F8 38 A0 02 B9 2B 13 F9 E4
1171:C1 11 99 2B 13 88 D0 F4 EF
1179:D8 4C BD 11 A9 00 8D 2B 77
1181:13 8D 2C 13 8D 2D 13 4C DA
1189:BD 11 AD 28 13 D0 0E AD AC
1191:29 13 29 F0 D0 07 AD 29 68
1199:13 C9 06 90 14 F8 38 A0 17
11A1:02 B9 28 13 F9 C1 11 99 FB
11A9:28 13 88 D0 F4 D8 4C BD 24
11B1:11 A9 00 8D 28 13 8D 29 71
11B9:13 8D 2A 13 20 31 13 60 8B
11C1:00 05 00 AD 15 D0 29 3B 79
11C9:8D 15 D0 A9 00 8D 54 11 9C
11D1:8D 55 11 A9 78 8D 04 D0 9F
11D9:A9 94 8D 05 D0 60 AD 15 70
11E1:D0 29 37 8D 15 D0 A9 00 B5
11E9:8D C1 12 8D C2 12 8D 10 E7
11F1:D0 A9 E3 8D 06 D0 A9 94 97
11F9:8D 07 D0 60 AD C1 12 F0 4E
1201:62 AD C2 12 4A B0 06 4A A6
1209:B0 16 4C 48 12 EE 06 D0 42
1211:AD 06 D0 F0 05 C9 2F F0 55
1219:47 60 A9 08 8D 10 D0 60 5D
1221:CE 06 D0 AD 06 D0 C9 87 B1
1229:F0 08 AD 55 11 C9 02 F0 77
1231:07 60 20 8B 11 4C 61 12 3C
1239:AD 04 D0 CD 06 D0 B0 01 02
1241:60 20 C4 11 4C 61 12 EE 42
1249:07 D0 AD 07 D0 C9 C8 F0 7B
1251:0F CD 0B D0 90 14 A9 C8 CF
1259:8D 0B D0 A9 00 8D 04 14 0E
1261:20 DF 11 AD 00 DC 29 10 60
1269:F0 01 60 AD 00 DC 29 0F 02
1271:38 E9 0F 4A B0 06 4A B0 95
1279:27 4A B0 12 A9 01 8D C2 2A
1281:12 A9 E3 8D 06 D0 A9 94 C9
1289:8D 07 D0 4C B3 12 A9 92 50
1291:8D C2 12 A9 D0 8D 06 D0 A3
1299:A9 94 8D 07 D0 4C B3 12 0B
12A1:A9 04 8D C2 12 A9 DA 8D F3
12A9:06 D0 A9 94 8D 07 D0 4C F9
12B1:B3 12 AD 15 D0 09 08 8D 83
12B9:15 D0 A9 FF 8D C1 12 60 C9
12C1:00 00 AD 04 D0 C9 2D D0 B4
12C9:15 AD 0B 06 C9 72 D0 0E 6D
12D1:AC E6 0D B9 96 19 09 0F 7D
12D9:99 96 19 20 04 13 AD 10 6D
12E1:D0 F0 1C AD 06 D0 C9 2E 3E
12E9:D0 15 AD 2C 06 C9 73 D0 43
12F1:0E AC E6 0D B9 BE 19 09 F9
12F9:0F 99 BE 19 20 16 13 20 15
1301:31 13 60 F8 18 A0 02 B9 21
1309:28 13 79 2E 13 99 28 13 7C
1311:88 10 F4 D8 06 F8 18 A0 63
1319:02 B9 2B 13 79 2E 13 99 89
1321:2B 13 88 10 F4 D8 60 00 7F
1329:00 00 00 00 00 01 00 51
1331:AD 28 13 29 0F 09 30 8D B7
1339:9B 07 AD 29 13 4A 4A 4A D7
1341:4A 09 30 8D 9C 07 AD 29 33
1349:13 29 0F 09 30 8D 9D 07 AF
1351:AD 2A 13 4A 4A 4A 4A 09 F8
1359:30 8D 9E 07 AD 2A 13 29 A4
1361:0F 09 30 8D 9F 07 AD 2B CF
1369:13 29 0F 09 30 8D B7 07 04
1371:AD 2C 13 4A 4A 4A 4A 09 99
1379:30 8D B8 07 AD 2C 13 29 10
1381:0F 09 30 8D B9 07 AD 2D C2
1389:13 4A 4A 4A 4A 09 30 8D 1E
1391:BA 07 AD 2D 13 29 0F 09 C3

1399:30 8D BB 07 60 CE 05 14 7F
13A1:F0 01 60 A9 3C 8D 05 14 5D
13A9:EE 09 14 AD 07 14 F0 26 77
13B1:AC 46 14 AD 09 14 D9 0A 73
13B9:14 90 1B C8 D9 0A 14 F0 0E
13C1:07 AD 1B D4 C9 20 B0 0E C5
13C9:CE 07 14 A9 FF 8D 03 14 86
13D1:EE 46 14 EE 46 14 AD 08 58
13D9:14 F0 26 AC 47 14 AD 09 C4
13E1:14 D9 28 14 90 1B C8 D9 2B
13E9:28 14 F0 07 AD 1B D4 C9 05
13F1:23 B0 0E CE 08 14 A9 FF 68
13F9:8D 04 14 EE 47 14 EE 47 09
1401:14 60 00 00 00 00 00 00 4B
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1411:10 14 1F 23 30 05 0E 12 20
1419:1A 1E 26 2A 32 03 0A 0E FC
1421:15 19 21 25 2A 2E 32 0F 0E
1429:28 0A 19 1E 2D 05 10 14 9E
1431:1F 23 30 05 0E 12 1A 1E 13
1439:26 2A 32 03 0A 0E 15 19 41
1441:21 25 2A 2E 32 00 00 CE CB
1449:06 14 F0 01 60 A9 06 8D EA
1451:06 14 AD 03 14 F0 17 CE C8
1459:09 D0 AD 09 D0 C9 A6 D0 4C
1461:0D 20 8C 14 A9 C8 8D 09 7F
1469:D0 A9 00 8D 03 14 AD 04 05
1471:14 F0 17 CE 0B D0 AD 0B B1
1479:D0 C9 A6 D0 0D 20 BA 14 D0
1481:A9 C8 8D 0B D0 A9 00 8D CD
1489:04 14 60 AD 28 13 D0 07 D5
1491:AD 29 13 29 F0 F0 14 F8 3C
1499:38 A0 02 B9 28 13 F9 E9 4D
14A1:14 99 28 13 88 D0 F4 D8 BA
14A9:4C E5 14 A9 00 8D 28 13 28
14B1:8D 29 13 8D 2A 13 4C E5 42
14B9:14 AD 2B 13 D0 07 AD 2C 18
14C1:13 29 F0 F0 14 F8 38 A0 80
14C9:02 B9 2B 13 F9 E9 14 99 31
14D1:2B 13 88 D0 F4 D8 4C E5 FB
14D9:14 A9 00 8D 2B 13 8D 2C 3C
14E1:13 8D 2D 13 20 31 13 60 1A
14E9:00 0A 00 48 A9 FF 8D F4 76
14F1:14 68 40 00 92 05 20 2F
14F9:20 20 20 20 20 CD C9 27
1501:CC CB 20 D2 D5 CE 20 20 FF
1509:20 20 20 20 20 1D 1D 2A
1511:1D 1D 1D 1D 1D 1D 1D 3B
1519:1D 1D 1D 1D 1D 20 20 4C
1521:20 20 C2 D9 20 C7 D5 48
1529:D3 20 D6 C1 CB C1 CC C9 05
1531:D3 20 20 20 20 1D 1D 2C
1539:1D 1D 1D 1D 1D 1D 1D 63
1541:1D 1D 1D 1D 1D 20 20 74
1549:20 20 20 20 20 20 20 73
1551:20 20 20 20 20 20 20 7B
1559:20 20 20 20 20 1D 1D 7A
1561:1D 1D 1D 1D 1D 1D 1D 8B
1569:1D 1D 1D 1D 1D 20 20 9C
1571:1C D0 D2 C5 D3 D3 20 D3 96
1579:D0 C1 C3 C5 20 D4 CF 20 65
1581:C2 C5 C7 C9 CE 2E 20 1D A0
1589:1D 1D 1D 1D 1D 1D 1D B3
1591:1D 1D 1D 1D 1D 1D 1F BD
1599:5B 5B 5B 5B 5B 5B 5B C3
15A1:5B 5B 5B 5B 5B 5B 5B CB
15A9:5B 5B 5B 5B 5B 5B 5B D3
15B1:92 05 20 20 20 20 20 4E
15B9:20 20 CD C9 CC CB 20 D2 FA
15C1:D5 CE 20 20 20 20 20 72

15C9:20 20 1D 1D 1D 1D 1D 36
15D1:1D 1D 1D 1D 1D 1D 1D FB
15D9:1D 1D 20 20 C5 CD D0 CC B3
15E1:CF D9 C5 C5 20 CF C6 20 6D
15E9:D4 C8 C5 20 CD CF CE D4 8B
15F1:C8 20 1D 1D 1D 1D 1D B2
15F9:1D 1D 1D 1D 1D 1D 1D 24
1601:1D 1D 20 20 20 20 20 EA
1609:20 20 20 20 20 20 20 35
1611:20 20 20 20 20 20 20 3D
1619:20 20 1D 1D 1D 1D 1D 87
1621:1D 1D 1D 1D 1D 1D 1D 4D
1629:1D 1D 20 20 20 20 20 13
1631:20 20 20 20 20 20 20 5D
1639:20 20 20 20 20 20 20 65
1641:20 20 1D 1D 1D 1D 1D AF
1649:1D 1D 1D 1D 1D 1D 75
1651:1D 1D 20 20 20 20 20 3B
1659:20 20 20 20 20 20 20 85
1661:20 20 20 20 20 20 20 8D
1669:20 20 1D 1D 1D 1D 1D D7
1671:1D 1D 1D 1D 1D 1D 1D 9D
1679:1D 1D 1F 5B 5B 5B 5B 6F
1681:5B 5B 5B 5B 5B 5B 5B AD
1689:5B 5B 5B 5B 5B 5B 5B B5
1691:5B 5B 5B 1C 20 20 20 51
1699:20 20 20 20 20 20 20 C5
16A1:20 20 20 20 20 20 20 CD
16A9:20 20 20 20 1D 1D 1D A8
16B1:1D 1D 1D 1D 1D 1D 1D DD
16B9:1D 1D 1D 1D 20 20 D9 CC
16C1:CF D5 27 D2 C5 20 C2 CF 61
16C9:D4 C8 20 C6 C9 D2 C5 C4 EC
16D1:21 21 20 20 13 9F 20 20 54
16D9:20 20 20 20 20 00 CC C1 C3
16E1:D9 C5 D2 20 CF CE C5 20 2E
16E9:20 20 20 20 20 20 1D 0D
16F1:1D 1D 1D 1D 1D 1D 1D 1E
16F9:1D 1D 1D 1D 1D 90 20 10
1701:20 20 20 20 20 20 20 2F
1709:05 30 30 30 30 30 20 71
1711:20 20 20 20 20 20 20 3F
1719:13 9C 20 20 20 20 20 DF
1721:20 D0 CC C1 D9 C5 D2 20 F4
1729:D4 D7 CF 20 20 20 20 95
1731:20 20 1D 1D 1D 1D 1D A1
1739:1D 1D 1D 1D 1D 1D 1D 67
1741:1D 1D 90 20 20 20 20 3B
1749:20 20 20 20 05 30 30 0F
1751:30 30 20 20 20 20 20 8B
1759:20 20 20 13 9F 20 D0 CD
1761:CC C1 D9 C5 D2 20 CF CE 83
1769:C5 20 20 9C D0 CC C1 D9 67
1771:C5 D2 20 D4 07 CF 20 1D E3
1779:1D 1D 1D 1D 1D 1D 1D A7
1781:1D 1D 1D 1D 1D 1D 90 23
1789:20 20 20 05 30 30 30 F6
1791:30 90 20 20 20 20 20 E3
1799:20 05 30 30 30 30 20 E4
17A1:20 20 20 13 92 1F 20 20 8E
17A9:C3 CF D0 D9 D2 C9 C7 C8 7B
17B1:D4 20 31 39 39 31 20 20 FA
17B9:C3 CF CD D0 D5 D4 C5 20 32
17C1:D0 D5 C2 CC C9 C3 C1 D4 8A
17C9:C9 CF CE D3 20 20 1D 1D C0
17D1:1D 1D 1D 1D 1D 1D 05 E7
17D9:BD B9 20 BC 20 BE 20 20 FE
17E1:12 41 42 92 20 20 20 20 BC
17E9:12 45 46 92 20 12 49 4A 8A
17F1:92 20 12 4D 4E 92 1D 1D 9C

PROGRAMS

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17F9:1D 1D 1D 1D 1D 1D 1D 1D 28
1801:1D 1D 1D 1D 1D 1D 1D 1D 31
1809:BA BB 20 BD 20 BF 12 40 C9
1811:92 20 12 43 44 92 20 20 D5
1819:20 20 12 47 48 92 20 12 F6
1821:4B 4C 92 20 12 4F 50 92 5F
1829:9F D0 CC C1 D9 C5 D2 20 BE
1831:CF CE C5 20 20 20 20 99
1839:20 20 05 CC C5 D6 C5 CC D0
1841:20 20 20 20 20 20 9C D0 1B
1849:CC C1 D9 C5 D2 20 D4 D7 80
1851:CF 20 20 20 20 05 30 30 1D
1859:30 30 30 20 20 20 20 97
1861:20 20 20 20 20 20 31 A2
1869:20 20 20 20 20 20 20 99
1871:20 20 30 30 30 30 20 85
1879:20 20 20 1C 12 20 20 D1 AA
1881:2D D1 D5 C9 D4 20 D2 4E
1889:D5 CE 2F D3 D4 CF D0 2D 30
1891:D0 C1 D5 D3 C5 20 20 D2 54
1899:CC D3 D4 CF D2 C5 2D D2 14
18A1:C5 D3 C5 D4 13 A0 A0 AC
18A9:A0 A0 A0 A0 A0 6F A0 70 E4
18B1:20 20 20 20 20 20 20 71 33
18B9:A0 A0 70 20 20 20 20 54
18C1:20 20 71 A0 6F A0 A0 22
18C9:A0 A0 A0 A0 A0 A0 5B 5C 2B
18D1:5D A0 A0 A0 A0 6F A0 70 6B
18D9:20 20 20 20 20 20 71 5B
18E1:A0 A0 70 20 20 20 20 7C
18E9:20 20 71 A0 6F A0 A0 4A
18F1:A0 5E 5F 60 A0 A0 61 62 A8
18F9:63 6D 6D 6D 6D 6F A0 70 96
1901:20 20 20 20 20 20 71 84
1909:A0 A0 70 20 20 20 20 A5
1911:20 20 71 A0 6F 6E 6E 6E 14
1919:6E 64 65 66 A0 A0 67 68 6D
1921:69 A0 A0 A0 A0 6F A0 70 C2
1929:20 20 20 20 20 20 71 AC
1931:A0 A0 70 20 20 20 20 CD
1939:20 20 71 A0 6F A0 A0 9B
1941:A0 6A 6B 6C A0 A0 A0 FB
1949:A0 A0 A0 A0 A0 6F A0 70 86
1951:20 20 20 20 20 20 71 D4
1959:A0 A0 70 20 20 20 20 F5
1961:20 20 71 A0 6F A0 A0 C3
1969:A0 A0 A0 A0 A0 A0 A0 9B
1971:A0 A0 A0 A0 A0 6F A0 70 AE
1979:20 20 20 20 20 20 71 FC
1981:A0 A0 70 20 20 20 20 1E
1989:20 20 71 A0 6F A0 A0 EB
1991:A0 A0 A0 A0 A0 F0 F0 F5
1999:F0 F0 F0 F0 F0 F0 F0 CB
19A1:F0 F0 F0 F0 F0 F0 F0 D3
19A9:F0 F0 F0 F0 F0 F0 F0 DB
19B1:F0 F0 F0 F0 F0 F0 F0 E3
19B9:F0 F0 F0 F0 F0 F0 F0 EB
19C1:F0 F0 F0 F0 F0 F0 F0 F3
19C9:F0 F0 F0 F0 F0 F0 F0 FB
19D1:F0 F0 F0 F0 F0 F0 F0 04
19D9:F0 F0 F0 F0 F0 F0 F0 0C
19E1:F0 F0 F0 F0 F0 55 55 7D
19E9:00 00 00 00 FF FF FF 1C
19F1:FF 00 00 00 00 00 00 24
19F9:3C 66 6E 76 66 3C 00 3D
1A01:18 38 18 18 18 7E 00 00 8E
1A09:3C 66 0C 30 60 7E 00 00 76
1A11:3C 66 1C 06 66 3C 00 00 05
1A19:1C 3C 6C 7E 0C 0C 00 70
1A21:7E 60 7C 06 66 3C 00 00 C0

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1A29:3C 60 7C 66 66 3C 00 00 AD
1A31:7E 66 0C 18 18 18 00 00 62
1A39:3C 66 3C 66 66 3C 00 00 37
1A41:3C 66 3E 06 66 3C 00 00 79
1A49:00 3C 66 7E 66 66 00 00 0E
1A51:00 7C 66 7C 66 7C 00 00 5E
1A59:00 3C 66 60 66 3C 00 00 93
1A61:00 78 6C 66 6C 78 00 00 EC
1A69:00 7E 60 78 60 7E 00 00 CD
1A71:00 7E 60 78 60 60 00 00 5D
1A79:00 3C 60 6E 66 3C 00 00 D3
1A81:00 66 66 7E 66 66 00 00 D0
1A89:00 3C 18 18 18 3C 00 00 03
1A91:00 1E 0C 0C 6C 38 00 00 D3
1A99:00 66 6C 7C 6C 66 00 00 79
1AA1:00 60 60 60 60 7E 00 00 FC
1AA9:00 63 77 7F 6B 63 00 00 86
1AB1:00 66 76 7E 6E 66 00 00 43
1AB9:00 3C 66 66 66 3C 00 00 54
1AC1:00 7C 66 66 7C 60 00 00 AD
1AC9:00 3C 66 66 6E 3C 06 00 B0
1AD1:00 7C 66 66 7C 66 00 00 D5
1AD9:00 3E 60 3C 06 7C 00 00 8F
1AE1:00 7E 18 18 18 18 00 00 5B
1AE9:00 66 66 66 66 3C 00 00 0F
1AF1:00 66 66 66 3C 18 00 00 35
1AF9:00 63 6B 7F 77 63 00 00 B5
1B01:00 66 3C 18 3C 66 00 00 55
1B09:00 66 66 3C 18 18 00 00 8A
1B11:00 7E 0C 18 30 7E 00 00 65
1B19:3F 5E 6E 77 7F 7D 4E 00 3A
1B21:FE 3D BB 77 EF DF B9 00 87
1B29:00 00 F0 F8 F8 F8 00 00 B8
1B31:00 00 0F 1F 1F 1F 00 00 B0
1B39:7F BC DD EE F7 FB 9D 00 F3
1B41:FC 7A 76 EE DE BE 72 57 80
1B49:57 4F 7F 7F 4F 57 57 75 E2
1B51:75 79 7F 7F 79 75 75 7C 91
1B59:7C 7C 7E 7E 7C 7C 7C 3E B1
1B61:3E 3E 7E 7E 3E 3E 3E AE 14
1B69:AE 9E FE FE FE 9E AE AE EA 66
1B71:EA F2 FE FE F2 EA EA EA 11
1B79:7D 7B 77 6E 5E 3F 00 B9 CC
1B81:DF EF 77 BB 3D FE 00 00 34
1B89:F8 F8 F8 F0 00 00 00 A8
1B91:1F 1F 1F 00 00 00 9D 91
1B99:FB F7 EE DD BC 7F 00 72 DD
1BA1:BE DE EE 76 7A FC 00 00 FB
1BA9:E0 E6 06 60 6E 00 00 7C
1BB1:07 67 60 06 76 70 00 00 27
1BB9:7E 7E 7E 7E 7E 7E 06 D1
1BC1:60 60 60 60 60 60 60 9D
1BC9:06 06 06 06 06 06 7C 76
1BD1:7C 7C 7E 7E 7C 7C 3E 2A
1BD9:3E 3E 7E 7E 3E 3E F8 D6
1BE1:FC 7E 7F 7F 7B 79 78 1F EF
1BE9:3F 7E FE FE DE 9E 1E 78 55
1BF1:78 78 F8 F8 00 00 00 1E 4F
1BF9:1E 1E 1F 1F 00 00 00 7E 1B
1C01:7E 3C 3C 3C 3C 3C 3C 5A
1C09:3C 3C 7E 7E 00 00 00 7E A4
1C11:7E 3C 3C 3C 3C 3C 3C 6A
1C19:3C 3F 7F 7F 00 00 00 27
1C21:1C FC FC FC 00 00 00 F8 0F
1C29:FC 79 7B 7F 7F 7F 7C 19
1C31:FC F0 E0 C0 80 80 C0 7B 4F
1C39:79 78 F8 F8 00 00 00 E0 DB
1C41:FC F8 7C 7C 00 00 00 FF 87
1C49:FF 78 78 78 78 7F 7F 8F 8F
1C51:FC 1E 0E 0E 1E FC F8 78 81

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1C59:78 78 F8 F8 00 00 00 78 13
1C61:3C 1E 0F 0F 00 00 00 7C 8E
1C69:7C 3C 3C 3C 3C 3C 3C C3
1C71:3E 3C 3C 3C 3C 3C 3C AA
1C79:3C 3F 3F 1F 00 00 00 3C B5
1C81:3C FC FC F8 00 00 00 F8 3F
1C89:F8 7C 7E 7F 7F 7F 7B 3E 54
1C91:3E 3C 3C 3C BC FC FC 79 90
1C99:78 78 F8 F8 00 00 00 FC D7
1CA1:FC 7C 3E 3E 00 00 00 FF 23
1CA9:FF FF FF FF FF FF FF FF E1
1CB1:FF FF 81 FF FF FF FF FF 1A
1CB9:F9 F3 E7 CF 9F 3F FF FF DF
1CC1:FF C3 99 81 99 99 FF FF 69
1CC9:FF 81 9F 87 9F 81 FF FF D1
1CD1:FF C3 E7 E7 E7 C3 FF FF C4
1CD9:FF 99 89 81 91 99 FF FF B4
1CEL:FF C3 99 99 99 C3 FF FF B3
1CE9:FF 83 99 99 83 9F FF FF 6A
1CF1:FF C3 99 99 91 C3 F9 FF 77
1CF9:FF 83 99 99 83 99 FF FF 62
1D01:FF C1 9F C3 F9 83 FF FF B9
1D09:FF 81 E7 E7 E7 E7 FF FF FD
1D11:FF 99 99 99 99 C3 FF 00 5A
1D19:00 00 00 00 00 00 00 53
1D21:00 00 00 00 00 00 00 5B
1D29:00 00 00 00 00 00 00 63
1D31:F4 00 00 FC 00 00 F4 00 9F
1D39:00 00 00 00 00 00 00 73
1D41:00 00 00 00 00 00 00 7B
1D49:00 00 00 00 00 00 00 83
1D51:00 00 00 00 00 00 00 8B
1D59:00 00 00 00 00 00 00 93
1D61:00 00 00 00 00 00 00 9B
1D69:00 00 00 00 00 70 00 65
1D71:70 00 00 70 00 00 20 2B
1D79:00 70 00 00 00 00 00 CF
1D81:00 00 00 00 00 00 00 BB
1D89:00 00 00 00 00 00 00 C3
1D91:00 00 00 00 00 00 00 CB
1D99:00 00 00 00 00 00 00 D3
1DA1:00 00 00 00 00 00 00 DB
1DA9:00 00 00 00 00 00 01 E4
1DB1:78 00 01 F8 00 01 78 00 CC
1DB9:00 00 00 00 00 00 00 F3
1DC1:00 00 00 00 00 00 00 FB
1DC9:00 00 00 00 00 00 00 04
1DD1:00 00 00 00 00 00 00 0C
1DD9:00 00 00 00 00 00 00 14
1DE1:00 00 00 00 00 00 00 1C
1DE9:00 00 00 00 70 00 00 E5
1DF1:20 00 00 70 00 00 70 24
1DF9:00 70 00 00 00 00 00 50
1E01:00 00 00 00 00 00 00 3D
1E09:00 00 00 00 00 00 00 45
1E11:00 00 00 00 00 00 00 4D
1E19:00 00 00 00 00 00 00 55
1E21:00 20 00 00 A8 00 00 98 43
1E29:00 00 20 00 00 20 00 02 EB
1E31:9A 00 00 A4 00 00 A8 00 56
1E39:00 68 00 00 A8 00 00 20 F4
1E41:00 02 22 00 00 00 00 42
1E49:00 00 00 00 00 00 00 85
1E51:00 00 00 00 00 00 00 8D
1E59:00 00 00 00 00 00 00 95
1E61:00 20 00 00 A8 00 00 98 83
1E69:00 02 22 00 00 20 00 00 EA
1E71:98 00 00 A4 00 00 A8 00 95
1E79:02 6A 00 00 A8 00 00 20 B6
1E81:00 00 20 00 00 00 00 C1

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1E89:00 00 00 00 00 00 00 00 C5
1E91:00 00 00 00 00 00 00 00 CD
1E99:28 00 00 AA 00 00 69 00 67
1EA1:00 14 00 00 FC 40 03 FF D1
1EA9:C0 0F 3F 00 04 3C 00 00 03
1EB1:38 00 15 EC 00 17 FC 00 D1
1EB9:03 0C 00 00 CC 00 02 8C 71
1EC1:00 00 08 00 00 0A 00 00 27
1EC9:00 00 00 00 00 00 00 00 06
1ED1:00 00 00 00 00 00 00 00 0E
1ED9:28 00 00 AA 00 00 69 00 A7
1EE1:00 14 40 00 3F C0 00 FF 28
1EE9:00 03 FC 00 0F 3C 00 04 F3
1EF1:38 00 00 2F 00 15 3F C0 D0
1EF9:15 30 C0 00 33 00 00 32 B0
1F01:80 00 20 00 00 A0 00 00 06
1F09:00 00 00 00 00 00 00 00 47
1F11:00 00 00 00 00 00 00 00 4F
1F19:28 00 00 AA 00 00 69 00 E8
1F21:00 14 00 01 3F 00 03 FF 74
1F29:C0 00 FC F0 00 3C 10 00 87
1F31:2C 00 00 3B 54 00 3F D4 2F
1F39:00 30 C0 00 33 00 00 32 67
1F41:80 00 20 00 00 A0 00 00 46
1F49:00 00 00 00 00 00 00 00 87
1F51:00 00 00 00 00 00 00 00 8F
1F59:28 00 00 AA 00 00 69 00 29
1F61:01 14 00 03 FC 00 00 FF 3D
1F69:00 00 3F C0 00 3C F0 00 6E
1F71:2C 10 00 F8 00 03 FC 54 B3
1F79:03 0C 54 00 CC 00 02 8C BD
1F81:00 00 08 00 00 0A 00 00 E8
1F89:00 00 00 00 00 00 00 00 C7
1F91:00 00 00 00 00 00 00 00 CF

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Gus Vakalis drinks his milk every day in Jamaica, New York.

TURBO POKER

By Mark Neri

Turbo Poker brings the classic game of poker into the computer age. No longer is poker a game of leisurely thought. Turbo Poker requires a fast hand on the joystick and an even faster mind to arrange a relentless storm of cards.

Turbo Poker is written entirely in machine language, but it loads and runs like a BASIC program. To type in Turbo Poker, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following.

Starting address: 0801

Ending address: 0E59

Be sure to save a copy of the program before you exit MLX.

When you are ready to play, type LOAD "TURBO POKER", 8 and press Return. When the cursor reappears, type RUN and press Return again. The Tur-

bo Poker screen will appear.

Playing the Game

Once the program has begun, select the level you want to play. To choose your level, use a joystick in port 2. Move the stick left and right to move the black level meter. When the needle is toward the left, the game is quite slow. As you move the needle to the right, the speed of the game increases. When the needle is on the far right, the game is extremely fast and quite difficult.

After you've selected a level, press the fire button to begin the game. A card will appear at the left side of the screen and begin to slide across to the right. When the card has gone about halfway across the screen, it will stop, and a new card will enter from the left. The object of the game is to form winning poker hands by guiding the cards with the joystick.

For those unfamiliar with poker, winning hands as well as their point values are shown below.

Two Pair. Two pairs of cards with matching numbers. 5 points.

Three of a Kind. Three cards of the same number. 10 points.

Straight. Five cards with consecutive numbers, of any suit. 20 points.

Flush. Five cards, all of the same suit. 30 points.

Full House. Two cards of one number and three of another number. 40 points.

Four of a Kind. Four cards of the same number. 50 points.

Straight Flush. Five cards with consecutive numbers, all of the same suit. 75 points.

Royal Flush. Ace, king, queen, jack, and 10, all of the same suit. 100 points.

In Turbo Poker, seven hands of five cards are formed vertically. A hand must contain five cards in order for it to be counted.

As cards slide across the screen, try to position them so that they'll form winning hands. If you try to put a card where there's already a card, the card that's already there will slide right, pushing along any cards that were there before. If any card ends up being pushed off the screen, the game is over. After each card is placed, any winning hands will be removed, and points will be awarded. The cards to their right will fill in the spaces that the removed cards leave. By forming hands and causing them to be removed, you can stop the cards from reaching the right edge of the screen and ending the game. Note that any of the seven columns is a hand, and a winning combination in any of them will be removed.

For each winning hand, your score will increase. The amount by which your score increases depends both on the hand you managed to form and the level you're playing. When you've removed a certain number of hands, your level will increase, and the cards will slide faster.

TURBO POKER

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0801:0B 08 C7 07 9E 32 30 36 56
0809:31 00 00 00 20 17 0C 20 47
0811:7F 0D A9 00 85 1C 85 1D 1E
0819:85 1E 85 1F 20 5F 0D 20 CE
0821:CC 0C A0 80 A9 FF 99 FF 37
0829:BF 88 D0 FA 20 67 0B A9 63
0831:00 85 06 85 09 85 0B 85 B5
0839:0A A5 1B 49 0F 85 1A E6 59
0841:1A 20 86 0C 20 85 0B 85 AA
0849:0E 29 0F 85 07 A5 0E 4A 1A
0851:4A 4A 4A 85 08 A5 02 85 1B
0859:04 A5 03 85 05 A5 0B F0 53
0861:05 C6 0B 4C A0 08 AE 00 4E
0869:DC 8A 29 01 D0 15 A5 06 EB
0871:F0 11 C6 06 A9 04 85 0B EA
0879:A5 02 38 E9 78 85 02 B0 11
0881:02 C6 03 8A 29 02 D0 17 57
0889:A5 06 C9 04 F0 11 E6 06 07
0891:A9 04 85 0B A5 02 18 69 A7
0899:78 85 02 90 02 E6 03 8A CC
08A1:29 08 D0 06 85 0A A9 01 6B
08A9:85 1A A5 0A F0 05 C6 0A 8B
08B1:4C C0 08 A5 1A 85 0A E6 55
08B9:09 E6 02 D0 02 E6 03 20 27
08C1:EB 0B 20 A2 0B 20 63 09 61
08C9:A5 09 C9 11 F0 03 4C 56 BB
08D1:08 20 F4 08 A4 1A 20 63 3E
08D9:09 88 D0 FA 20 F4 08 A4 E3
08E1:1A 20 63 09 88 D0 FA 20 A1
08E9:F4 08 20 37 09 20 6E 09 9C
08F1:4C 30 08 A5 02 85 16 A5 87
08F9:03 18 69 D4 85 17 A0 3D 13
0901:B1 02 C8 91 02 88 B1 16 4A
0909:C8 91 16 88 88 C0 FF D0 47

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PROGRAMS

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0911:EF A9 A0 A0 00 91 02 A0 8E
0919:28 91 02 A0 17 91 02 A0 91
0921:18 91 02 A9 05 A0 00 91 BA
0929:16 A0 28 91 16 A0 17 91 7F
0931:16 A0 18 91 16 60 A5 06 16
0939:0A 0A 0A 85 0C A9 C0 85 7A
0941:0D A0 06 B1 0C C9 FF F0 56
0949:05 68 68 4C 0A 0D A0 06 95
0951:B1 0C C8 91 0C 88 88 C0 C5
0959:FF D0 F5 A5 0E A0 00 91 3D
0961:0C 60 AD 11 D0 10 FB AD C4
0969:11 D0 30 FB 60 A9 00 85 2D
0971:0F A0 04 A9 00 85 10 99 1E
0979:3F C0 88 D0 FA A0 16 99 99
0981:43 C0 88 D0 FA A4 0F B9 C5
0989:00 C0 20 E9 09 B9 08 C0 6E
0991:20 E9 09 B9 10 C0 20 E9 98
0999:09 B9 18 C0 20 E9 09 B9 22
09A1:20 C0 20 E9 09 A5 10 D0 66
09A9:36 20 03 0A 20 1B 0A 20 81
09B1:40 0A A6 13 E0 00 F0 07 5C
09B9:20 2F 0D CA 4C B5 09 A5 E6
09C1:13 C9 00 F0 1A 20 BE 0A B7
09C9:E6 1F A5 1F C9 0C D0 0F EC
09D1:A5 1B C9 0F F0 09 E6 1B 3C
09D9:20 F0 0C A9 00 85 1F E6 91
09E1:0F A5 0F C9 08 D0 8A 60 5C
09E9:C9 FF F0 11 48 29 0F AA BF
09F1:FE 44 C0 68 4A 4A 4A 8D
09F9:AA FE 40 C0 60 4A 01 85 66
0A01:10 60 A9 00 85 11 A0 04 20
0A09:B9 3F C0 C9 05 D0 07 A9 A1
0A11:01 85 11 4C 1A 0A 88 D0 C8
0A19:EF 60 A9 00 85 12 AA AD E9
0A21:50 C0 F0 01 E8 A0 0D B9 59
0A29:43 C0 F0 08 E8 00 05 F0 73
0A31:09 4C 37 0A A2 00 88 D0 5B
0A39:EE 60 A9 01 85 12 60 A5 FC
0A41:11 F0 1D A5 12 F0 14 AD 42
0A49:52 C0 F0 0A AD 44 C0 D0 46
0A51:05 A9 64 4C AD 0A A9 4B D7
0A59:4C AD 0A A9 1E 4C AD 0A 62
0A61:A5 12 F0 05 A9 14 4C AD 1F
0A69:0A A9 04 20 B0 0A E0 01 DF
0A71:D0 05 A9 32 4C AD 0A A9 5E
0A79:03 20 B0 0A E0 01 D0 0E 88
0A81:A9 02 20 B0 0A E0 01 D0 A0
0A89:05 A9 28 4C AD 0A A9 03 40
0A91:20 B0 0A E0 01 D0 05 A9 30
0A99:0A 4C AD 0A A9 02 20 B0 62
0AA1:0A E0 02 D0 05 A9 05 4C 65
0AA9:AD 0A A9 00 85 13 60 A0 26
0AB1:0D A2 00 D9 43 C0 D0 01 52
0AB9:E8 88 D0 F7 60 A4 0F B9 6B
0AC1:00 C0 20 97 0B B9 08 C0 93
0AC9:20 97 0B B9 10 C0 20 97 2C
0AD1:0B B9 18 C0 20 97 0B B9 18
0AD9:20 C0 20 97 0B B9 01 C0 AD
0AE1:99 00 C0 B9 09 C0 99 08 FC
0AE9:C0 B9 11 C0 99 10 C0 B9 43
0AF1:19 C0 99 18 C0 B9 21 C0 67
0AF9:99 20 C0 C8 C0 88 D0 DD 2D
0B01:A9 FF 8D 06 C0 8D 0E C0 17
0B09:8D 16 C0 8D 1E C0 8D 26 91
0B11:C0 A9 05 85 0D 85 15 A9 3D
0B19:D9 85 17 85 19 A9 A6 85 FA
0B21:0C 85 16 A9 A3 85 14 85 DC
0B29:18 A2 0E A5 0F 0A 18 65 46
0B31:0F A8 B1 0C 91 14 B1 16 46
0B39:91 18 C8 C0 15 D0 F3 CA E1

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0B41:F0 21 A5 0C 18 69 28 85 C9
0B49:0C 85 16 90 04 E6 0D E6 4F
0B51:17 A5 14 18 69 28 85 14 6B
0B59:85 18 90 04 E6 15 E6 19 FC
0B61:4C 2C 0B C6 0F 60 A2 40 F5
0B69:A9 01 9D 83 C0 CA D0 FA 4E
0B71:A0 04 A9 00 99 8F C0 99 34
0B79:9F C0 99 AF C0 99 BF C0 6A
0B81:88 D0 F1 60 AD 1B D4 29 01
0B89:3F AA BD 84 C0 F0 F5 A9 49
0B91:00 9D 84 C0 8A 60 C9 FF 15
0B99:F0 06 AA A9 01 9D 84 C0 E1
0BA1:60 A5 02 85 16 A5 03 18 4F
0BA9:69 D4 85 17 A4 07 B9 DA 5B
0BB1:0B A0 00 91 02 A0 29 91 05
0BB9:02 A4 08 B9 E7 0B A0 28 6B
0BC1:91 02 A0 01 91 02 A5 08 2D
0BC9:29 02 A0 00 91 16 C8 91 11
0BD1:16 A0 28 91 16 C8 91 16 46
0BD9:60 32 33 34 35 36 37 38 7F
0BE1:39 14 0A 11 0B 01 41 58 23
0BE9:5A 53 A5 04 85 16 A5 05 CB
0BF1:18 69 D4 85 17 A9 A0 A0 A2
0BF9:00 91 04 C8 91 04 A0 28 87
0C01:91 04 C8 91 04 A9 05 A0 86
0C09:00 91 16 C8 91 16 A0 28 23
0C11:91 16 C8 91 16 60 A9 01 30
0C19:8D 21 D0 A9 06 8D 20 D0 6C
0C21:A2 01 A0 18 A9 8E 85 14 31
0C29:85 16 A9 03 85 15 A9 D7 9A
0C31:85 17 A9 A0 91 14 A9 05 46
0C39:91 16 C8 D0 F5 CA F0 07 89
0C41:E6 15 E6 17 4C 33 C0 A0 48
0C49:A0 B9 B9 0D 99 FF 03 A9 A4
0C51:06 99 FF D7 99 27 D8 A9 15
0C59:00 99 C7 D8 A9 20 99 C7 27
0C61:04 88 D0 E5 A0 05 B9 7B 1E
0C69:0C 99 FB 04 B9 80 C0 99 2F
0C71:0B 05 88 D0 F1 A9 30 8D 92
0C79:39 05 60 0C 05 16 05 0C D2
0C81:13 03 0F 12 05 AD 1B D4 D0
0C89:29 07 C9 05 B0 F7 85 06 F7
0C91:85 02 A9 00 85 03 06 02 68
0C99:06 02 06 02 A5 02 85 16 6C
0CA1:A5 03 85 17 06 02 06 02 B5
0CA9:06 02 26 03 06 02 26 03 C1
0CB1:A5 02 38 E5 16 85 02 A5 F2
0CB9:03 E9 00 85 03 A5 02 18 F0
0CC1:69 90 85 02 A5 03 69 05 94
0CC9:85 03 60 A0 00 AE 00 DC 13
0CD1:8A 29 04 D0 05 C0 00 F0 23
0CD9:01 88 8A 29 08 D0 05 C0 C6
0CE1:0F F0 01 C8 8A 29 10 D0 54
0CE9:03 84 1B 60 84 1B 20 F8 D7
0CF1:0C 20 63 09 4C 0E C0 A2 6D
0CF9:10 A9 A0 9D 1D 05 CA D0 D5
0D01:FA A4 1B A9 DD 99 1E 05 56
0D09:60 A0 09 B9 25 0D 99 D7 A0
0D11:04 88 D0 F7 AD 00 DC 29 39
0D19:10 D0 F9 AD 00 DC 29 10 5F
0D21:F0 F9 4C 0D 08 07 01 0D F7
0D29:05 20 0F 16 05 12 48 8A 9C
0D31:48 98 48 20 A4 0D A5 1B 60
0D39:18 69 01 C9 0A 90 03 18 27
0D41:69 06 F8 18 65 1C 85 1C F4
0D49:A5 1D 69 00 85 1D A5 1E B4
0D51:69 00 85 1E D8 20 5F 0D C5
0D59:68 A8 68 AA 68 60 A2 03 96
0D61:A0 00 B5 1B 48 4A 4A 7E
0D69:4A 18 69 30 99 33 05 C8 4B

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0D71:68 29 0F 18 69 30 99 33 DF
0D79:05 C8 CA D0 E5 60 A9 FF B2
0D81:8D 0E D4 8D 0F D4 A9 80 F8
0D89:8D 12 D4 A9 8F 8D 18 D4 DB
0D91:A9 14 8D 00 D4 8D 01 D4 EA
0D99:A9 08 8D 05 D4 A9 00 8D 67
0DA1:06 D4 60 A9 10 8D 04 D4 2E
0DA9:20 63 09 A9 11 8D 04 D4 04
0DB1:A2 05 20 63 09 CA D0 FA A8
0DB9:60 A0 C3 F2 C9 D5 F2 C3 23
0DC1:C9 F0 C9 A0 D5 C9 A0 69 C0
0DC9:20 20 5F A0 69 20 20 5F 5D
0DD1:A0 20 A0 69 E9 A0 20 20 21
0DD9:20 20 A0 69 20 20 5F A0 97
0DE1:A0 A0 A0 C2 C2 C2 EB F2 A0
0DE9:CB EB F1 C9 C2 C2 A0 20 42
0DF1:A0 A0 20 A0 20 A0 A0 20 77
0DF9:A0 20 69 E9 A0 A0 20 E2 E2
0E01:E2 A0 A0 20 A0 A0 20 A0 35
0E09:A0 A0 A0 CB CA CB CA 56
0E11:C3 F1 C3 F1 F1 CB A0 20 43
0E19:20 20 E9 A0 20 A0 A0 20 79
0E21:A0 20 DF 5F A0 A0 20 62 B1
0E29:62 A0 A0 20 20 20 E9 A0 AA
0E31:A0 A0 A0 A0 A0 A0 A0 4D
0E39:A0 A0 A0 A0 A0 A0 A0 20 D4
0E41:A0 A0 A0 A0 DF 20 20 E9 9D
0E49:A0 20 A0 DF 5F A0 20 20 AD
0E51:20 20 A0 20 A0 DF 5F A0 7F
0E59:A0 20 00 00 00 00 00 00 CD

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Mark Neri is a card shark who lives in Longwood, Florida.

FILE LORD

By Daniel Lightner

There's no end to the data you can manage with this database program for the 64, and it's easy to create and access files with hundreds of records. With File Lord you can keep track of business contacts, birthdays, phone numbers, record collections, friends' addresses, and much more. Plus, File Lord allows you to specify the number of fields and their names in each record. You can also specify the length of each field.

Getting Started

File Lord is written entirely in machine language; enter it with MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following values.

Starting address: 0801

Ending address: 19AF 14C8

After you've finished typing in the program, be sure to save a copy to disk under the name of File Lord.

Using the Program

File Lord is easy to use. You just load and run it as you would any BASIC program. When you first run the program, you must load a file or create a new one. To create a file, choose option 7 of the File Lord menu. Note that you must use the Shift key with all of the options below option 6. After you have selected an option, the computer prompts you to make sure. If the label displayed is correct, press the Y key; if not, press N.

Number of Fields

If you chose option 7, you'll be prompted for a filename. Enter the name you wish to call the file and press Return. Next, you'll be asked for the number of fields that you wish each record to contain. For example, if you want the file to contain addresses, you'd want to include people's names. So Name would be one field. You'd also want street addresses, so that's two. You'd also want the city, state, and ZIP code for each person. If you want each of these to be a separate field, it might look something like this.

Name	Field 1
Street	Field 2
City	Field 3
State	Field 4
ZIP code	Field 5

In this example there are five fields. So to answer the prompt, you would press the 5 key. File Lord allows up to nine fields.

In the example above, the Name field could've been replaced by three fields to record a person's first name, middle name, and last name. That would've left two fields remaining. We could then include a telephone number and perhaps a field for notes.

Field Names

When you've entered the number of fields you want, File Lord will ask you to name them. At the prompt, give the name for each field indicated.

Field Size

When you've finished naming the fields, File Lord will prompt you for the maximum number of characters you want for each field. File Lord will ac-

cept up to 18 characters for each field. If you don't need that many, however, don't enter that many. For example, in a field for telephone numbers, you would only need 3 for the area code, 1 for a dash, 3 more for the prefix, 1 for another dash, and then 4 for the final four digits. It might look like this: 409-555-1212. In this case, you would choose 12 characters. You can abbreviate the states with two-letter postal codes.

When you've finished entering the required data to set up a file, File Lord displays the information and asks if everything is correct. Press N if you wish to make changes in the format.

Write a Record

Now that you've created a file, let's write a record by selecting option 2. Notice that File Lord prompts you with your field names. You simply enter the required information at the prompt. If you don't know all the correct data, simply enter something fictitious; it can easily be deleted later.

Read a Record

Select option 1 to read a record. File Lord tells you how many records you have and asks for a number to read. Enter a record number to read it. If several files are available, you can scroll through them by selecting option 4.

If you wish to read a record but can't remember its number, you can select option 5 to search for a string. Suppose you want the file on John Jones. Select option 5 and enter John Jones at the prompt. File Lord will scan the records until it finds that string or reaches the end of the records. When it finds a match, it will display that record onscreen. If it finds more than one record, it will display them one at a time, in the order that they were found.

Delete a Record

You can delete unwanted information quite easily. Find the record number you wish to delete and then select option 3. When a record is deleted, all the record numbers that are higher will be decreased by one.

Print a Record

Use option 6 to dump a record to the printer. Make sure your printer is

turned on and ready before choosing this feature.

Other Options

If you select Delete a File, this option will scratch from the disk the file currently in memory. Use this option if you're modifying a file; scratch the old file before saving the new version.

Save This File will save the file currently in memory, with the filename that you specified when you created it.

Load a file by entering the corresponding option number and following the prompts.

You can view a disk directory by pressing the Shift key and the 4 key simultaneously. To stop a directory listing, press f7. Restart the listing by pressing f5.

Press Shift-Q when you wish to exit File Lord and return to BASIC.

FILE LORD

```
0801:0B 08 70 17 9E 32 34 30 6E
0809:37 00 00 00 20 20 20 96
0811:20 20 20 20 20 A0 C4 B9 06
0819:3C 08 99 F8 00 B9 FD 08 F6
0821:99 33 03 88 D0 F1 A0 09 4C
0829:B9 0C 08 99 FF 03 88 D0 A1
0831:F7 A9 B0 85 2D A9 19 85 DD
0839:2E 4C 00 01 0D 60 01 B0 2D
0841:19 33 13 B9 6E 09 99 E8 5C
0849:07 C8 D0 F7 EE 02 01 EE 19
0851:05 01 C6 F9 D0 ED A2 03 23
0859:20 34 03 F0 33 C9 07 D0 95
0861:16 A2 01 20 34 03 D0 0A A0
0869:A2 04 20 34 03 18 69 07 65
0871:10 05 A2 0A 20 34 03 85 1D
0879:A8 A5 A7 85 A9 A5 FE 85 FB
0881:F7 A5 FF 85 F8 20 6C 03 73
0889:A5 F8 85 FF A5 F7 85 FE 72
0891:E8 20 34 03 D0 1E A2 08 21
0899:20 34 03 A0 02 84 A8 85 2A
08A1:A6 18 A5 FC 65 A6 85 F7 58
08A9:A5 FD 65 A7 85 F8 20 6C EF
08B1:03 4C 13 01 E8 20 34 03 FB
08B9:D0 1C A0 03 84 A8 E8 20 36
08C1:34 03 F0 08 A2 08 20 34 F4
08C9:03 4C 5C 01 A2 0C 20 34 C3
08D1:03 E6 A7 4C 5C 01 E8 20 AF
08D9:34 03 D0 0A E8 20 34 03 B2
08E1:18 69 04 A8 D0 D6 E8 20 37
08E9:34 03 D0 0A D0 02 20 34 21
08F1:03 18 69 06 D0 ED A2 08 A2
08F9:20 34 03 D0 E6 A9 00 85 F7
0901:A7 A4 FB F0 0C 06 FA 2A 37
0909:26 A7 C6 FB CA D0 F2 A8 D8
0911:60 48 B1 FE 85 FA A9 08 FE
0919:85 FB 68 A4 FE D0 02 C6 4A
0921:FF C6 FE C0 E7 D0 DE A4 B5
0929:FF C0 07 D0 D8 A9 37 85 BA
0931:01 58 4C D0 08 A4 A8 F0 49
0939:22 A5 F7 38 E5 A8 B0 03 7E
0941:C6 F8 38 85 F7 A5 FC E5 8A
```

PROGRAMS

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0949:A8 B0 02 C6 FD 85 FC B1 3A
0951:F7 88 91 FC 98 D0 F8 C4 42
0959:A9 F0 0A B1 F7 C6 FD C6 76
0961:F8 C6 A9 10 EC 60 78 E6 98
0969:01 4C 16 08 60 00 0B 08 73
0971:C8 07 9E 32 30 36 31 00 5D
0979:00 00 E6 9F 78 A5 01 29 E7
0981:FE 85 01 A9 C1 8D 18 03 A6
0989:A9 34 8D 14 03 58 C5 75 EA
0991:BA A2 D5 8D EF B4 DC 79 C2
0999:0F A8 D3 99 00 D4 F0 4E F4
09A1:11 F6 A9 09 8D 05 97 E1 51
09A9:8D 02 D4 A9 0E 20 00 78 A1
09B1:6E F2 93 E4 23 1B 02 27 29
09B9:F0 2F C9 D1 F0 31 C9 32 78
09C1:F0 30 C9 31 F0 32 C9 34 BC
09C9:F0 39 C9 33 F0 3B C9 35 4C
09D1:CF E0 49 93 36 F0 3F C9 24
09D9:29 F0 46 C9 CC F0 48 C9 A6
09E1:28 F0 4A C9 24 F0 4C 4C F3
09E9:4E EE 08 50 0D 84 4C D7 CF
09F1:50 41 2B C8 1C 28 C0 C7 39
09F9:20 1F 0A 5E 41 1C 4E C1 E3
0A01:AC 0B 4C 5E 41 56 0C A5 BE
0A09:90 DF 0C D5 38 1A 05 30 A0
0A11:39 0B BE 0E 5B 05 98 39 9C
0A19:05 CE 0F 4C 46 08 BB 78 4C
0A21:83 3B 63 11 06 F0 E0 8D 86
0A29:85 E5 4C E2 FC A7 A9 92 9D
0A31:21 DD 02 14 B3 B1 A7 41 6C
0A39:39 85 CD 20 0B 61 A1 FC 25
0A41:08 93 4E 11 0D 3B 60 F5 25
0A49:AC 06 42 11 56 0C 10 F3 85
0A51:00 07 75 31 1F 87 31 94 F6
0A59:44 80 EB 3C 1E 15 1E EF 62
0A61:C1 E1 C9 D0 90 03 4C 19 57
0A69:09 C1 2D 52 C3 A9 E7 8C 5E
0A71:E4 AE B2 02 F3 49 0C 14 0B
0A79:F0 49 0C 86 82 2F F6 70 72
0A81:9C 86 A9 F1 1B 20 1C 95 01
0A89:A1 C3 01 54 46 A9 1D CC A4
0A91:AF B0 06 91 FB C8 4C 9D BC
0A99:09 18 81 38 03 10 A8 0B 46
0AA1:18 20 F4 78 0C 8A 3C 23 8E
0AA9:00 72 CF EC 9B E8 EC 1C 99
0AB1:E5 94 43 55 10 E7 80 15 D1
0AB9:44 3A 10 40 7A 51 13 1A DD
0AC1:E9 05 60 4C 2B 09 4C 38 2B
0AC9:0F 4C 2C 06 71 01 B4 0B 61
0AD1:4C 5E 0C 4C 42 12 4C E7 C4
0AD9:0C E4 6E C5 02 23 30 CE 23
0AE1:87 CE E3 9E 4F F3 2C 8A 01
0AE9:38 10 04 AD E9 18 5F D0 B8
0AF1:D7 03 6D 15 20 D6 CD 57 01
0AF9:01 CE 42 02 F0 BF 47 52 12
0B01:BE 4C 11 C0 C9 05 F0 AD A9
0B09:20 01 12 3C 23 E4 9F 20 81
0B11:A0 0E D4 2C B6 87 18 09 65
0B19:8D 1B D1 C9 30 90 28 C9 71
0B21:3A B0 24 C8 E2 32 82 EF 66
0B29:20 19 14 99 3D 13 4F F6 7D
0B31:15 3C D9 0D 4C 8D 0A 73 0D
0B39:06 F0 8B 6E 21 60 08 3A BB
0B41:10 51 42 18 15 12 90 52 E1
0B49:B8 38 A9 AF ED 94 0E A9 81
0B51:19 ED 79 0E 1B 7E B5 C0 7E
0B59:F0 A0 6D B6 02 5E 1F 60 51
0B61:10 00 C2 AD E9 10 00 5D 9F
0B69:B3 73 00 31 D0 DB D4 02 EA
0B71:B2 02 D0 D3 98 50 61 E1 63
0B79:41 1A 84 A6 C9 07 D0 F5 B3
0B81:A9 99 FB 6D AE F4 E8 6C B0
0B89:64 0A F1 76 00 D0 05 78 BF
0B91:14 A3 F1 08 11 F0 18 B5 8B
0B99:CF 63 1D 39 40 E1 61 56 4A
0BA1:20 80 88 87 73 CD 43 90 5B
0BA9:51 40 32 45 6B 90 33 02 19
0BB1:B0 CD 02 B0 03 4C A5 82 F5
0BB9:3D 97 92 04 60 1D F0 2D 6D
0BC1:C9 9D F3 42 08 0D F0 9F BC
0BC9:4C 6A 0B ED C9 02 B0 07 9F
0BD1:50 3E 14 2F C5 60 41 00 47
0BD9:83 45 ED 46 65 46 4C 84 86
0BE1:14 3B 0B 20 16 0B 4C 1C C5
0BE9:0B 08 4F 02 95 D4 C6 79 98
0BF1:64 C0 C4 D7 47 06 5C 3C C7
0BF9:36 0A 19 FE 60 C8 4C 05 84
0C01:0C BA D5 8C 66 C0 80 F6 7F
0C09:6D 78 85 FD E8 85 FE 87 69
0C11:5E E7 E4 79 9D DC 07 02 F6
0C19:08 A0 C9 88 C3 D0 88 28 B9
0C21:28 38 05 19 44 D0 0B 28 31
0C29:21 3E 19 C4 1C 9A 84 60 85
0C31:E9 35 0C EB 38 7A 0D 18 A9
0C39:87 AE 69 F9 C8 AD 21 69 36
0C41:10 8E 0C 44 03 41 9C 12 33
0C49:E7 7F ED 9E AC E2 09 44 24
0C51:AE 1A 05 28 F3 6C EA 41 D2
0C59:07 34 30 81 28 CD 91 23 DE
0C61:90 56 A9 AF CC 00 82 10 03
0C69:14 81 14 62 8A 22 50 80 92
0C71:7C B1 FB DD BB F0 27 27 A8
0C79:4E B0 87 34 08 AD 13 0C 42
0C81:00 14 2C 20 36 0C CD AC 50
0C89:FA DE AD AD 02 CD AB 19 1F
0C91:D0 D6 80 78 2C BB 30 1C 2C
0C99:98 0C E8 EC 18 D5 DD B4 75
0CA1:0A A0 34 98 00 88 44 0C AD
0CA9:4C B5 0C 60 A9 04 08 87 D1
0CB1:0A 61 79 0C 42 ED 20 4E 6F
0CB9:0A CE B7 8D B2 94 11 4A AE
0CC1:4F 4E F0 D5 C9 59 D0 6E 84
0CC9:3D A5 FB ED AA 19 35 2F 9B
0CD1:E9 1C F3 22 10 E6 1A 95 6C
0CD9:80 01 A2 04 A0 07 B7 31 C8
0CE1:E0 A2 01 7A 88 C3 07 E0 1D
0CE9:00 A2 11 57 C9 C9 25 BA BC
0CF1:02 A9 01 CC B9 20 FE 45 F3
0CF9:41 A7 6E EC C8 04 8C 47 EF
0D01:00 E7 20 79 0F 7C 04 0B 96
0D09:20 6C AF 02 B0 63 F5 53 B6
0D11:36 F1 1B E2 42 20 88 CA C2
0D19:22 1F 08 93 99 EE 18 BD CB
0D21:92 F4 A9 E8 BD 5A 16 85 8E
0D29:A0 A2 09 20 CE 0E 20 5E AC
0D31:D7 12 45 BA EE 72 B0 05 B7
0D39:63 0B 1A CC 1A 30 D0 F5 01
0D41:AA 81 16 A9 1D 91 FD C8 62
0D49:4C C8 E0 E9 E0 52 CE F6 5B
0D51:70 12 31 4A E5 11 70 61 A8
0D59:02 71 06 FA 40 8C 17 C5 69
0D61:84 71 0B C5 84 E1 A9 3F 16
0D69:D5 3E 76 0C 01 7B 1C 11 CC
0D71:90 CF C9 3A B0 CB D9 1E 2B
0D79:D0 3B DA E0 C9 31 D0 BD A6
0D81:81 32 C9 30 90 B6 C9 39 51
0D89:B0 B2 0D 2F 26 AC B2 AA 31
0D91:9B 02 F0 1B AD 34 BF 49 D0
0D99:A3 A3 18 6D 0A 2A 7C 60 9A
0DA1:95 E0 F0 12 4C EF 0D AD E7
0DA9:36 E0 C4 84 18 69 0A 99 0C
0DB1:A1 19 4C 53 C3 39 B9 72 8A
0DB9:12 7C 13 20 23 71 63 3C 42
0DC1:0F 4C 7F 0E 3C BD 81 A0 C3
0DC9:AD B5 02 B7 F5 60 4C 50 FD
0DD1:0D AE 16 AD 5E E0 21 14 88
0DD9:20 8A 12 38 75 CC 09 02 5F
0DE1:0D 8F 5D D0 E0 01 0D D0 15
0DE9:F6 3C 46 C0 B8 87 FF 22 69
0DF1:7B E4 48 20 0D 84 B1 FB E7
0DF9:C9 2A D0 F2 20 0B 09 8A 96
0E01:97 10 11 06 72 4C D2 B4 8E
0E09:3C 49 20 34 11 A9 10 8D B9
0E11:A7 05 97 E9 10 1F 34 09 42
0E19:35 A0 03 35 9F 0C A0 9F B9
0E21:79 08 17 20 D5 0A 29 C4 CE
0E29:05 8D BA 02 4C 1F 0A 20 B5
0E31:83 8B 7F CD 55 F3 55 80 64
0E39:A2 EE 55 62 71 58 66 C8 B5
0E41:81 A9 E9 85 FB 18 A2 09 AC
0E49:FC AE A5 AC 21 1C FB 20 A0
0E51:D8 9D 07 20 E0 70 01 06 F4
0E59:D0 A9 AF 8D AD 49 00 07 B0
0E61:AE 19 C4 AA D4 2C E9 88 12
0E69:00 68 8D FE 18 8D AB 19 A8
0E71:8D AC 19 60 20 F5 11 20 2D
0E79:98 12 48 B7 0D F0 20 D9 45
0E81:12 18 AD EA 18 69 03 A2 20
0E89:EB A0 18 9E CF 0F E4 CC 02
0E91:0F 34 33 0F 4C 73 19 17 13
0E99:48 E0 BB 4C AD 0E A7 B4 F7
0EA1:20 D0 8D 21 D0 DB 2A 1A 2A
0EA9:A2 A2 92 A0 10 20 BD EC 7D
0EB1:A2 08 59 B9 20 BA 90 C0 B5
0EB9:83 10 08 20 B4 18 6F 85 09
0EC1:B9 20 96 87 92 00 C1 BE E6
0EC9:20 A5 FF C9 30 D0 B7 20 50
0ED1:AB FF A2 2E 77 00 B8 E2 0B
0ED9:57 E0 60 DA 20 C9 78 00 AC
0EE1:9A 40 D0 2F AD B2 07 5C 0B
0EE9:85 F3 29 28 0C 86 38 0D 65
0EF1:B0 A8 20 3F 65 A0 AA 51 DC
0EF9:20 93 A8 38 A0 32 30 05 D3
0F01:82 F0 23 22 C9 50 10 A5 78
0F09:CB C9 03 F0 0F C9 06 E3 7E
0F11:5F 70 90 C1 07 07 71 74 D4
0F19:B1 02 4C 2C E2 01 81 85 16
0F21:4C 26 10 1E 20 C6 FF A9 98
0F29:02 20 C3 19 70 00 D1 34 B5
0F31:4C 44 12 24 D5 8E 68 12 D6
0F39:A2 09 8E 2C A0 B0 85 20 72
0F41:DD 1A 08 AD 39 FD BD 10 3A
0F49:9D C0 1E F0 02 AD 2B FD CD
0F51:DA 10 8D F1 02 C8 D0 E3 6A
0F59:98 CA F0 11 C9 B0 F0 03 9B
0F61:8D B0 2E 2C F2 02 30 05 FF
0F69:AD EF 02 F0 05 29 7F A0 16
0F71:9C AC CA 10 C4 60 01 00 0D
0F79:0A 00 64 00 E8 03 10 27 C3
0F81:E7 18 45 A9 0F 0D F9 A9 27
0F89:FF 8D 00 94 04 14 8D 01 E0
0F91:46 41 20 1D 85 4A A1 00 91
0F99:30 60 FF D0 FB 63 11 40 C4
0FA1:00 11 CB 4D 4B D0 EE A9 77
0FA9:40 8D 04 04 70 1C AD 21 7C
0FB1:00 50 0C 02 C9 02 D0 06 DD
0FB9:A9 00 8C 18 D4 60 A9 07 62
0FC1:4C F4 60 3A 5C 9B 4E 0A EA
0FC9:C0 E1 9B 11 92 D5 50 C6 98
0FD1:17 03 3B D4 0F 44 12 3C DA

```

```

0FD9:10 A7 F7 40 C4 13 03 71 D6
0FE1:BA 0F 44 86 47 4C C7 CE DB
0FE9:43 0D 3C 42 09 F5 40 C4 FD
0FF1:18 E3 95 41 BE 33 43 7E A3
0FF9:07 09 2C 71 ED EC 65 78 E0
1001:E8 81 E4 AC C4 11 B3 54 83
1009:F0 4F 43 19 3C 0D 24 F1 BF
1011:F4 C4 53 A3 16 29 8F 43 39
1019:0A 3C 2F 62 F3 40 C4 0F 92
1021:03 B1 E1 91 92 E3 11 15 DF
1029:8F 47 77 3D 1E 71 58 15 22
1031:66 A2 11 B9 52 78 15 10 99
1039:CF 51 D9 B3 04 A8 17 58 55
1041:1B 48 3B 0D 20 72 03 48 52
1049:20 F5 34 C4 DC D3 10 0B 2B
1051:4F 43 C0 3C 0D 1C F1 74 F6
1059:14 0F A5 16 D5 C3 1B CE 20
1061:4C E5 10 83 0D 00 21 33 39
1069:00 C0 08 D0 F5 9A 40 7A DC
1071:12 84 36 C9 59 F0 07 C9 85
1079:4E F0 06 4C 9B 1F 77 01 CB
1081:11 08 00 D9 A5 FD 69 12 D3
1089:40 05 A5 FE 0A 02 FE 60 66
1091:A9 FF 85 FD A9 18 85 FE CE
1099:8E D7 14 09 18 AD 15 01 AC
10A1:A0 02 B2 02 60 17 5B FC 1C
10A9:6E 1C 4C EC 2C 14 DE 19 E8
10B1:9F A9 05 44 90 3E 43 90 85
10B9:91 9D 91 01 C4 20 E4 FF BC
10C1:C9 0A 96 F9 8D 90 C9 81 89
10C9:B0 5A C9 14 F0 3D C9 0D 70
10D1:F0 24 C9 20 F0 E6 C9 22 84
10D9:F0 E2 C9 2C F0 DE C9 7B 39
10E1:B0 DA AD BC 02 87 0F 1E FC
10E9:A2 CC A7 02 F0 CF 95 CA 60
10F1:49 13 F2 28 28 00 F0 BF 3F
10F9:F2 2E 8A 84 0C 0F EE 60 93
1101:06 60 AC A8 C0 01 B0 C1 8B
1109:1C 32 54 38 9A DF E9 E6 E2
1111:02 4C 04 13 08 80 80 4C CF
1119:12 13 71 1A 08 FB E4 19 EB
1121:5A 0A 20 C1 12 6D A4 93 36
1129:9E 91 38 52 B9 EE 18 0C F0
1131:6A EA 27 F4 A9 0D CE 1A B0
1139:0A 43 48 A9 96 67 A2 20 8C
1141:DC 12 BD A1 19 8D 0E 32 1B
1149:00 B1 FD C9 1D F0 4F C2 42
1151:23 C0 12 D0 F2 99 46 B0 BF
1159:AD BA 50 35 04 F0 05 A9 F5
1161:60 0D FF 30 66 10 11 32 C1
1169:B1 FE 20 D2 FF 37 1C 38 E1
1171:D0 EE AD B9 02 C9 01 F0 33
1179:0E 18 A5 FB 6D B3 02 85 E0
1181:FB A5 FC 69 00 85 FC E8 3A
1189:20 B3 12 20 CF 12 CD FE 4E
1191:18 D0 95 60 A9 20 4C C0 D3
1199:40 E1 09 2E 4C E4 13 A9 1E
11A1:00 18 A6 B0 29 AE 0A 2E EF
11A9:90 3C A2 00 BD E5 38 E9 57
11B1:21 22 40 18 BD 88 B1 02 EB
11B9:D0 BD 8D 14 8D C0 05 A0 C0
11C1:00 4C 59 14 95 81 02 6D 87
11C9:B0 42 AD 02 AD B0 02 6D 4C
11D1:B1 02 8D AE 02 C8 CC AF 66
11D9:02 D0 E7 E8 E0 E7 21 C7 6D
11E1:60 A0 05 88 B9 3C C8 99 6F
11E9:40 09 88 C0 00 D0 F3 A9 60
11F1:30 8D 35 03 18 AD CA 09 7C
11F9:69 01 8D 34 03 C9 05 D0 20
1201:DF 4C 28 14 27 03 00 00 B3
1209:00 10 E8 64 0A 01 93 5C 6C
1211:F0 E3 40 96 0F 34 D8 9A AD
1219:2E 2E 47 50 59 41 7F E0 7D
1221:2E 31 39 39 32 D3 8E CC 2E
1229:C3 4F 4D 50 55 BB D0 55 42
1231:42 4C 49 43 41 54 49 4F 24
1239:4E 56 F2 0F C9 21 87 09 54
1241:CC 54 FA 00 90 0B 1C C1 EA
1249:AF C2 0C 95 C0 53 D1 53 1B
1251:68 88 56 45 44 11 11 B5 29
1259:63 C3 31 A7 73 E3 03 34 26
1261:3C 4E 32 7C 3C D7 1A 13 CD
1269:D1 F8 58 F1 33 11 AD F0 09
1271:00 87 8E 38 3C 36 34 7C 6C
1279:3C 32 0C 04 8E 9C 53 78 10
1281:42 36 35 7C 08 33 10 04 F3
1289:3C 1E 66 D3 60 2A 43 23 F7
1291:64 C3 36 27 A4 D2 81 0A 8F
1299:D4 4F 20 D0 52 78 F7 43 B4
12A1:E3 63 C3 37 E7 A3 C3 91 63
12A9:07 CE 78 E4 81 00 19 F1 92
12B1:38 D9 CA 10 08 38 A8 36 6B
12B9:3C 46 3C 9C C1 D3 41 83 42
12C1:70 83 D4 59 03 8C 8D 11 A5
12C9:CC 9F 8D 82 08 4A 81 C1 44
12D1:C1 D9 F0 D8 F0 24 F1 28 1D
12D9:08 20 32 C4 98 4C B0 01 F4
12E1:82 09 88 A6 A2 A3 C2 E3 12
12E9:9A 20 C5 C3 98 61 C6 44 74
12F1:84 00 CC 67 11 0D 11 A8 EF
12F9:81 8C 00 38 96 28 37 2D 76
1301:D1 D1 75 D5 53 C2 D3 90 6E
1309:34 A8 20 D7 49 B3 35 20 98
1311:CB 45 59 0D 00 A6 00 4E 53
1319:1C A1 0D 8D 61 06 A1 79 10
1321:71 20 73 A2 25 88 29 AC EA
1329:F2 96 11 80 F4 68 4F 57 52
1331:8E AD 4E C1 86 87 8D 41 9E
1339:3F 96 AA CC 39 29 0D 4B 9A
1341:8C 6E 41 4D 8F 3F 49 32 84
1349:20 54 4D 3E 43 4F 4E BA D0
1351:02 48 52 44 AC 0C 4F 55 A2
1359:52 AC A0 18 46 93 82 49 38
1361:58 AC 83 73 45 56 EE B4 9C
1369:30 65 49 47 48 40 83 6E 57
1371:86 1D A4 48 05 03 1E 80 2C
1379:B8 65 10 44 D0 70 02 40 28
1381:6D 41 58 49 4D 4D 00 8D 7B
1389:6E 55 4D 42 39 DF 80 88 DC
1391:63 48 41 52 2A 23 20 52 39
1399:4E 50 80 20 2B BA 61 07 1B
13A1:65 41 B0 64 00 49 07 11 6B
13A9:D6 28 31 2D 31 38 29 98 93
13B1:19 04 9A 44 63 69 87 00 CC
13B9:EE 63 76 36 C0 43 45 1C 1C
13C1:C0 2E 0E 0B 99 A9 6F 55 ED
13C9:A0 39 6F 46 20 6D 45 4D 6F
13D1:EE 59 20 21 21 21 1C 62 04
13D9:09 50 6E 4F 24 8D 38 A6 C9
13E1:45 53 45 2C 0A 3E 00 04 38
13E9:00 43 6F 7C 92 C1 7C 63 8E
13F1:2E 23 01 20 98 67 72 65 C6
13F9:73 73 14 70 61 63 65 20 C3
1401:62 61 72 12 0E 39 C7 45 4C
1409:89 C7 E9 86 48 A7 28 43 02
1411:51 3F 1C 20 79 2F 6E DD 7A
1419:55 77 D0 CD 3F 20 93 0D 6F
1421:1C 1D 1D 12 2A 20 71 55 6D
1429:CB 2D 00 63 52 82 3E E0 B2
1431:A1 6E 45 57 A3 9B 77 A7 06
1439:09 5E 36 3C 0C E0 6A 03 C3
1441:E4 43 52 4F 4C 4C DE 88 C5
1449:53 79 A4 EE A0 00 8E 39 58
1451:68 45 41 52 43 48 F4 04 75
1459:1E 20 A4 73 54 82 47 68 08
1461:24 72 45 43 4F 52 14 74 75
1469:4F 20 70 52 49 4E 02 B8 B4
1471:52 88 30 6C 4F 41 44 20 D9
1479:C3 73 41 56 7D 06 61 12 C6
1481:31 64 45 D7 54 82 24 64 DA
1489:49 53 4B 20 66 49 4C 45 CC
1491:20 2A 0D 0D 96 38 BF 53 2F
1499:30 3A 35 D1 11 0F A8 51 93
14A1:8F 93 28 8F 89 14 8F 84 B4
14A9:0A 0F 82 0D 81 2A 2A 2A EE
14B1:CE 60 0E 81 22 00 00 00 44
14B9:C0 00 00 00 00 00 00 00 42

```

Daniel Lightner has had numerous programs published in Gazette. His most recent was File Copier (November 1991). He manipulates his files in Sidney, Montana.

PIXEL MOVER

By Hong Pham

One of the many interesting features of the VIC-II chip is its ability to support smooth scrolling, both vertically and horizontally. With a single POKE to location \$D011 or \$D016 (53265 and 53270, respectively), the screen will smoothly scroll in a vertical or horizontal direction—but only for seven pixels.

When the seven-pixel limit is reached, a program is required to scroll the screen's contents one character further. BASIC is too slow, however, to move the contents fast enough to prevent annoying jitters.

With Pixel Mover, you can smoothly scroll the entire screen pixel by pixel in eight different directions without any jitters. Or if you like, you can scroll up to eight pixels at a time. Best of all, with Pixel Mover installed, you can do it quite easily with just one powerful SYS command from your BASIC program.

Getting Started

Because Pixel Mover is written entirely in machine language, use MLX, our machine language entry program, to type it in. See "Typing Aids" elsewhere in this section. When prompted for starting and ending addresses, respond with the following values.

Starting address: CAB0

Ending address: D001

PROGRAMS

When you've finished typing in Pixel Mover, be sure to save it to a work disk under the given name because Relocator and Demo, a demonstration program, search for that name.

To activate Pixel Mover, enter the following commands: LOAD "PIXEL MOVER",8,1; NEW; and SYS 51888.

SYS and POKE Parameters

Because Pixel Mover is totally relocatable, a fixed address should not be used. Instead, use a variable to represent the starting address and use offsets of the variable to access subroutines or memory locations within the program. The default base or starting address is \$CAB0 (51888). For example, if you let SA equal starting address 51888, then SYS 52013 would be written as SYS SA + 125.

SYS SA

Use this SYS with a variable set to Pixel Mover's starting address to activate the program. An important interrupt program that is necessary for Pixel Mover's subroutines to work is activated once this command is made.

SYS SA + 51

This SYS will disable Pixel Mover and restore the former interrupt vector.

SYS SA + 125, *direction, amount*

This scrolls the screen in a direction specified by the first parameter. The following figure illustrates the directional values.

```
7 0 1
 \ | /
6- -2
 / | \
5 4 3
```

The second parameter, a value between 1 and 320, indicates how many pixels to scroll in that direction.

If you are calling this routine from machine language, use JSR SA + \$70 (112). Use the X register to indicate the direction of the scroll, the Y register to indicate the LSB of the amount to scroll, and the accumulator to represent the MSB.

POKE/PEEK (SA + 87)

This is the shadow location for the VIC-II 53270 location. Read and write to this location instead of the standard 53270 location. For example, to switch to multicolor mode, use POKE SA + 87, PEEK(SA + 87) OR 16 instead of POKE 53270, PEEK(53270) OR 16.

POKE/PEEK (SA + 92)

Poke or peek to this location instead of using 53265. For example, to switch to hi-res mode, use POKE SA + 92, PEEK(SA + 92) OR 32 instead of POKE 53265, PEEK(53265) OR 32.

POKE/PEEK (SA + 97)

To change the screen memory or the character memory, poke to this location instead of the standard VIC-II 53272 location.

POKE 648, *page number*

If you are switching to a new screen memory location, set the corresponding page number to location 648. To determine the page number, divide the screen memory location by 256. The default value for this location is 4 (screen memory set at 1024).

Make sure that the screen location is within the VIC-II's 16K video bank. If there's a need to access memory locations beyond this 16K bank, change the bank accordingly (it's beyond the scope of this article to explain how).

POKE SA + 700

Poke to this location to set the page number of the buffer screen location. This is the secondary screen where the text is manipulated and then transferred back to the default screen.

When Pixel Mover scrolls the screen by one character, the contents of the default screen are transferred to the secondary screen and then manipulated. Pixel Mover relocates the screen memory to the secondary screen and then transfers the contents in the secondary screen back to the default screen. After this is finished, Pixel Mover defaults back to the original screen memory. Like the default

screen, the secondary screen must be placed in the same bank. When writing large BASIC programs, it's advisable to relocate the VIC-II video bank and screen memory to prevent Pixel Mover from corrupting the BASIC program.

The default value for the location of the secondary screen is \$3C, or decimal 60 (screen memory is at \$3C00, or 15360).

POKE SA + 706

Set the page number of the color memory buffer location. Pixel Mover copies the contents of the color memory at \$D800 (55296) to a buffer area where the contents are manipulated, and then Pixel Mover recopies them back to the original color memory. Because the color memory can't be relocated and because of the 64's slow speed, colors may smear a bit as the screen scrolls. This problem is easily observed when adjacent contrasting colors are scrolled. Unlike the buffer screen, the color memory buffer can be set to any location in memory provided that it starts on a page. The default value for this location is \$40, or decimal 64 (the buffer location is at \$4000, or 16384).

POKE SA + 375

Use this command to adjust the vertical scroll delay counter. Slow down or speed up the scrolling speed by increasing or decreasing the delay value (the lower the value, the faster the scrolling speed, and vice versa). The default value is 18.

POKE SA + 372

This will adjust the horizontal scroll delay counter. The default value is 18.

POKE SA + 1335

This location adjusts the diagonal scroll speed. The default value is 22.

POKE SA + 599

Poking this location will set the horizontal scroll wrap on or off. If the argument is a 0, any character that is about to be scrolled off the screen will wrap around and be placed on the next line. Any oth-

er arguments will disable this feature.

POKE SA + 211

If a 0 is poked to this location, Pixel Mover will scroll the screen one pixel at a time. If any other value is poked to this location, then Pixel Mover will scroll the screen eight pixels at a time.

Jump Vectors

For every eight pixels scrolled, Pixel Mover performs a JMP to an RTS instruction. You can take advantage of this setup by setting the JMP instruction to jump to your own scrolling routine, such as when you want to display a new line. Be sure to write the new line to the buffer screen and terminate the routine with an RTS. There are four such JMP instructions for the four basic scroll directions: left, right, up, and down. Write the new JMP address to the following offset in low byte, high byte order.

- SA + 608 to move left
- SA + 688 to move right
- SA + 1168 to move up
- SA + 1243 to move down

A Demonstration

To see what Pixel Mover can do, type in and run Demo. It will demonstrate how different commands can be used to create various effects in your own programs. Demo is written entirely in BASIC. To help avoid typing errors, enter it using The Automatic Proofreader. See "Typing Aids" again. After you've finished typing, be sure to save it to a disk containing Pixel Mover, or the program will crash when you try to run it. If you saved Pixel Mover with some other filename, be sure to use that name in line 40 of Demo.

A New Location

Pixel Mover was designed to be compatible with other programs, but it resides in an area that's very popular with many other ML programs, such as fast loaders. When Pixel Mover and other ML programs try to use the same memory area, disaster can occur.

Relocator solves this potential problem by relocating Pixel Mover to another area in memory. Since Relocator is written in machine language, type it in

with MLX. At the prompts, respond with the following values.

Starting address: 0801
Ending address: 0EC8

To relocate Pixel Mover, simply load and run Relocator. When Relocator prompts for a new starting address for Pixel Mover, enter the desired address in hexadecimal. If you know the decimal value but not the hexadecimal value, the following program will convert any decimal value to a hexadecimal equivalent.

```

PE 10 HS = "0123456789ABCDEF": B = 16:
B1 = 2 ↑ B
FP 20 INPUT "ENTER DECIMAL VALUE";N: IF
ABS (N) > B1 - 1 THEN 20
PP 30 NS = " ": IF N < 0 THEN N = B1 + N
FF 40 FOR I=1 TO B/4:T = N - (INT (N/16) *
16): NS = MID$(HS,T + 1,1) + NS: N = N/
16
CG 50 NEXT: PRINT NS

```

After Relocator relocates Pixel Mover, insert a work disk to save the new version. If the save is successful, you may exit to BASIC or relocate another copy of Pixel Mover.

PIXEL MOVER

```

CAB0:78 A9 7F 8D 0D DC A9 81 66
CAB8:8D 1A D0 AD 11 D0 29 7F 2E
CAC0:8D 11 D0 AD 14 03 AE 15 75
CAC8:03 8D 1E CB 8E 1F CB A9 F5
CAD0:FC A2 CA 8D 14 03 8E 15 9E
CAD8:03 AD 18 D0 8D 11 CB 58 0C
CAE0:4C 76 CD 78 A9 81 8D 0E F6
CAE8:DC A9 00 8D 1A D0 AD 1E BD
CAF0:CB AE 1F CB 8D 14 03 8E 0A
CAF8:15 03 58 60 AD 19 D0 8D EB
CB00:19 D0 29 01 F0 17 A9 C8 8D
CB08:8D 16 D0 A9 1B 8D 11 D0 A2
CB10:A9 15 8D 18 D0 A9 01 8D B1
CB18:12 D0 8D BF CC 4C 31 EA 7F
CB20:8E 58 CB 84 27 85 28 20 96
CB28:62 CD 4C 43 CB 20 62 CD 93
CB30:20 F1 B7 8E 58 CB 20 8E 74
CB38:E2 20 8A AD 20 F7 B7 84 4A
CB40:27 85 28 20 57 CB A5 27 30
CB48:D0 02 C6 28 C6 27 A5 28 6A
CB50:D0 F1 A5 27 D0 ED 60 A2 95
CB58:FF F0 15 CA F0 15 CA F0 DD
CB60:21 CA F0 12 CA F0 18 CA 8F
CB68:F0 0F CA F0 0F 4C 95 CC 46
CB70:4C 08 CC 4C 71 CC 4C 7D 63
CB78:CC 4C 89 CC 4C DC CB 4C 41
CB80:45 CC A9 00 F0 0C 20 B9 D4
CB88:CC 20 12 CD 20 26 CC 4C 2D
CB90:D0 CB AD 07 CB 29 07 C9 84
CB98:07 F0 06 EE 07 CB 4C 26 C5

```

```

CBA0:CC 20 12 CD AD 07 CB 29 10
CBA8:F8 8D 07 CB 38 08 20 D0 B0
CBB0:CB 28 B0 0E AD 24 CC C9 90
CBB8:15 90 14 38 E9 14 AA 4C 46
CBC0:2B CC AD 27 CC C9 19 90 99
CBC8:06 38 E9 18 4C BE CB 60 85
CBD0:20 A1 CC 20 B9 CC 20 8D 4B
CBD8:CF 4C AD CC AD 83 CB F0 F1
CBE0:09 20 B9 CC 20 C3 CC 4C FE
CBE8:8C CB AD 07 CB 29 07 F0 E1
CBF0:06 CE 07 CB 4C 26 CC 20 91
CBF8:C3 CC AD 07 CB 29 F8 09 C9
CC00:07 8D 07 CB 38 4C AD CB 38
CC08:AD 83 CB F0 0C 20 B9 CC 03
CC10:20 F7 CE 20 23 CC 4C D0 49
CC18:CB AD 0C CB 29 07 F0 14 9C
CC20:CE 0C CB A9 12 2C A9 12 DE
CC28:AA F0 08 A0 00 88 D0 FD 20
CC30:CA D0 FA 60 20 F7 CE AD F4
CC38:0C CB 29 F8 09 07 8D 0C 0B
CC40:CB 18 4C AD CB AD 83 CB 12
CC48:F0 09 20 B9 CC 20 42 CF 77
CC50:4C 13 CC AD 0C CB 29 07 32
CC58:C9 07 F0 06 EE 0C CB 4C A2
CC60:23 CC 20 42 CF AD 0C CB FF
CC68:29 F8 8D 0C CB 18 4C AD 4C
CC70:CB 20 DA CF 20 08 CC 20 2B
CC78:82 CB 4C F4 CF 20 DA CF A3
CC80:20 82 CB 20 45 CC 4C F4 31
CC88:CF 20 DA CF 20 45 CC 20 3A
CC90:DC CB 4C F4 CF 20 DA CF E8
CC98:20 08 CC 20 DC CB 4C F4 83
CCA0:CF AD 11 CB 29 0F 0D CF DB
CCA8:CD 8D 11 CB 60 AD 11 CB 13
CCB0:29 0F 0D C6 CD 8D 11 CB 43
CCB8:60 A9 00 8D BF CC A9 00 4A
CCC0:F0 FC 60 A2 00 BD 01 FF 41
CCC8:9D 00 FF BD 01 FF 9D 00 50
CCD0:FF BD 01 FF 9D 00 FF BD A4
CCD8:01 FF 9D 00 FF BD 01 D8 78
CCE0:9D 00 FF BD 01 D9 9D 00 CF
CCE8:FF BD 01 DA 9D 00 FF BD 6A
CCF0:01 DB 9D 00 FF E8 D0 CD C8
CCF8:A9 20 8D E7 FF AD 86 02 65
CD00:8D E7 FF 20 CE CF A9 00 67
CD08:F0 05 A2 27 20 D3 CE 4C 5E
CD10:FE CF A2 00 BD FF FF 9D FE
CD18:00 FF BD FF FF 9D 00 FF E1
CD20:BD FF FF 9D 00 FF BD FF EF
CD28:FF 9D 00 FF BD FF D7 9D 66
CD30:00 F6 BD FF D8 9D 00 FF 7E
CD38:BD FF D9 9D 00 FF BD FF 43
CD40:DA 9D 00 FF E8 D0 CD A9 80
CD48:20 8D 00 FF AD 86 02 8D 70
CD50:00 FF 20 CE CF AD 07 CD ED
CD58:F0 05 A2 00 20 D3 CE 4C 3C
CD60:FE CF AD 88 02 C9 FF D0 B5
CD68:0D A9 FF C9 3C D0 07 A9 6E
CD70:FF C9 40 D0 01 60 AD 88 01
CD78:02 8D 66 CD 85 27 AD 6C B2
CD80:CD 85 28 A5 27 C9 3F 90 33
CD88:0A 38 A5 27 E9 40 85 27 E0
CD90:4C 83 CD A5 28 C9 3F 90 BE
CD98:0A 38 A5 28 E9 40 85 28 02
CDA0:4C 93 CD A5 27 F0 0D 38 AA
CDA8:A5 27 E9 04 85 27 EE C6 CB
CDB0:CD 4C A3 CD A5 28 F0 0D 54
CDB8:38 A5 28 E9 04 85 28 EE F2
CDC0:CF CD 4C B4 CD A9 00 0A AB
CDC8:0A 0A 8A 8D C6 CD A9 00 C6

```

PROGRAMS

```

CDD0:0A 0A 0A 0A 8D CF CD AD CA
CDD8:18 D0 8D 11 CB 20 AD CC 7E
CDE0:AE 6C CD 8E CA CC 8E 19 51
CDE8:CD 8E FE CE 8E 49 CF 8E A3
CDF0:91 CF 8E 4B CD 8E 7D CF 43
CDF8:8E 6A CD 8E 8E D0 CC 8E 9E
CE00:1F CD 8E 04 CF 8E 4F CF D9
CE08:8E 97 CF 8E 8E D6 CC 8E 53
CE10:25 CD 8E 0A CF 8E 55 CF 59
CE18:8E 9D CF 8E 8E DC CC 8E FC
CE20:2B CD 8E 10 CF 8E 5B CF D8
CE28:8E A3 CF 8E FC CC 8E 32 43
CE30:CF 8E D5 CF 8E C6 CF AE EE
CE38:72 CD 8E E2 CC 8E 31 CD 53
CE40:8E 16 CF 8E 61 CF 8E A9 9E
CE48:CF 8E 83 CF 8E 70 CD 8E 3F
CE50:51 CD 8E 8E 8E CC 8E 37 DE
CE58:CD 8E 1C CF 8E 67 CF 8E 41
CE60:AF CF 8E 8E EE CC 8E 3D D4
CE68:CD 8E 22 CF 8E 6D CF 8E 2A
CE70:B5 CF 8E 8E F4 CC 8E 43 1E
CE78:CD 8E 28 CF 8E 73 CF 8E 13
CE80:BB CF 8E 38 CF 8E 02 CD CF
CE88:AE 88 02 CA 8E 16 CD 8E 83
CE90:46 CF 8E 8E C7 CC 8E FB D5
CE98:CE 8E 94 CF 8E 1C CD 8E DF
CEA0:4C CF 8E 8E CD CC 8E 01 1E
CEA8:CF 8E 9A CF 8E 22 CD 8E 49
CEB0:52 CF 8E 8E D3 CC 8E 07 67
CEB8:CF 8E A0 CF 8E 28 CD 8E 32
CEC0:58 CF 8E 8E D9 CC 8E 0B B0
CEC8:CF 8E A6 CF 8E C9 CF 8E 8D
CED0:D2 CF 60 A0 18 AD 6C CD FF
CED8:8D E4 CE A9 00 8D E3 CE B7
CEE0:A9 20 9D FF FF 18 AD E3 AE
CEE8:CE 69 28 8D E3 CE 90 03 A4
CEF0:EE E4 CE 88 10 EA 60 A2 31
CEF8:00 BD 28 FF 9D 00 FF BD B5
CF00:28 FF 9D 00 FF BD 28 FF AE
CF08:9D 00 FF BD 28 FF 9D 00 CE
CF10:FF BD 28 D8 9D 00 FF BD 5C
CF18:28 D9 9D 00 FF BD 28 DA 18
CF20:9D 00 FF BD 28 DB 9D 00 56
CF28:FF E8 D0 CD A2 27 A9 20 1E
CF30:9D C0 FF AD 86 02 9D C0 E1
CF38:FE CA 10 F2 20 CE CF 4C 63
CF40:FE CF A2 00 BD D8 FF 9D 96
CF48:00 FF BD D8 FF 9D 00 FF A3
CF50:BD D8 FF 9D 00 FF BD D8 33
CF58:FF 9D 00 FF BD D8 D7 9D FD
CF60:00 FF BD D8 D8 9D 00 FF 82
CF68:BD D8 D9 9D 00 FF BD D8 86
CF70:DA 9D 00 FF E8 D0 CD A2 AD
CF78:27 A9 20 9D 00 FF AD 86 D5
CF80:02 9D 00 FE CA 10 F2 20 15
CF88:CE CF 4C FE CF A2 00 BD C3
CF90:00 FF 9D 00 FF BD 00 FF DA
CF98:9D 00 FF BD 00 FF 9D 00 1E
CFA0:FF BD 00 FF 9D 00 FF BD 5A
CFA8:00 FF 9D 00 D8 BD 00 FF B9
CFB0:9D 00 D9 BD 00 FF 9D 00 71
CFB8:DA BD 00 FF 9D 00 DB E8 C2
CFC0:D0 CD A2 07 BD F8 FF 9D 70
CFC8:F8 FF CA 10 F7 60 A2 07 CC
CFD0:BD F8 FF 9D F8 FF CA 10 D4
CFD8:F7 60 AD 27 CC AE 24 CC EA
CFE0:8D F5 CF 8E F7 CF A9 16 10
CFE8:4A AA E8 E8 E8 8D 27 CC 9C
CFF0:8E 24 CC 60 A9 FF A2 FF 13
CFF8:8D 27 CC 8E 24 CC 60 00 C0

```

DEMO

```

DA 10 REM PIXEL MOVER DEMO
DR 20 REM COPYRIGHT 1992 - COM
PUTE PUBLICATIONS INTL L
TD - ALL RIGHTS RESERVED
JD 30 REM
KJ 40 A=A+1:IF A=1 THEN LOAD"P
IXEL MOVER",8,1
PM 50 SA= 51888:EN= SA+125:XP=
SA+87:YP= SA+92:D1= SA+
375:D2= SA+372:WR= SA+59
9
AS 60 SP= SA+211:TK= SA+51:B1=
53280:B2= 53281:SC= PEE
K(648)*256
PR 70 EF= -65536:P= 1000:S2= 5
1700:C= 0:CK =C:X= 782:Y
= 781
RJ 80 SP$="{22 SPACES}":REM 22
SPACES
HA 90 REM ---- ML CHROUT WEDGE
----
AH 100 REM (TOTALLY RELOCATABL
E; SET S2 TO START ADDR
ESS OF WEDGE)
HR 110 DATA 141,-16,142,-18,14
0,-20,165,154,201,3,240
,9,169,0,162,0,160,0,76
EP 120 DATA 202,241,173,-16,20
1,13,240,4,201,17,208,2
36,164,214,192,24,208,2
30
QD 130 DATA 169,0,170,160,8,32
,-112,198,214,32,16,22
9,76,-15,-65536
CB 140 REM ----
AJ 150 READA:ZA=ABS(A):IFA=EFT
HEN220
QH 160 CK=CK+ZA:IFSGN(A)=-1THE
N180
JR 170 POKES2+C,A:C=C+1:POKE B
1,A:GOTO150
MM 180 IFZA>1000THENZZ=SA+ZA-1
000:GOTO200
CC 190 ZZ=S2+ZA
FG 200 HI=INT(ZZ/256):LO=ZZ-HI
*256:POKES2+C,LO:POKES2
+C+1,HI:C=C+2:GOTO150
DF 210 REM ----
JF 220 IF CK<>7031THEN PRINT"E
RROR IN DATA STATEMENTS
!":STOP
AF 230 SYS TK:SYS 65418:SYS SA
MP 240 HI=INT(S2/256):LO=S2-HI
*256:POKE 806,LO:POKE 8
07,HI:REM SET NEW VECTO
R
DQ 250 POKE B1,0:POKE B2,0:POK
E 648,224:PRINT"{4}
{CLR}":POKE648,SC/256
PQ 260 POKE SP,0:POKE YP,23:RE
M ENTER 24 ROW MODE
RR 270 POKE D2,18:SYS EN,0,200
:POKE D2,30
MA 280 PRINT"{8}{CLR}":GOSUB11
10
BE 290 PRINT SPC(14)"{13 P}"

```

```

ES 300 PRINT SPC(14)"{5}{RVS}
{SPACE}PIXEL MOVER "
KE 310 PRINT SPC(14)"{4}{13 Y}
{8}"
JX 320 PRINT:PRINT "{2 SPACES}
COPYRIGHT 1992 BY COMPU
TE PUBLICATIONS"
RD 330 PRINT:PRINT "{3 SPACES}
WELCOME TO PIXEL MOVER,
THE SMOOTH"
CR 340 PRINT"SCROLLING PROGRAM
FOR THE COMMODORE 64!"
GM 350 PRINT"WITH PIXEL MOVER,
YOU CAN SMOOTHLY"
AG 360 PRINT"SCROLL THE WHOLE
{SPACE}SCREEN ONE PIXEL
AT A"
CC 370 PRINT"TIME IN ALL EIGHT
DIRECTIONS, EVEN"
CK 380 PRINT"FROM BASIC!{YEL}"
GD 390 PRINT:PRINTSPC(6)"PRESS
A KEY TO CONTINUE...."
EC 400 SYS EN,0,40
DP 410 GETA$:IF A$="" THEN410
MD 420 SYS EN,0,152
SE 430 POKE WR,1:POKE D1,19:PO
KE D2,19:POKE XP,192:PO
KE YP,19
FM 440 PRINT"{5}{CLR}":GOSUB11
20
GP 450 X1=9:Y1=8:GOSUB1170:PRI
NTLEFT$(SP$,21);
XB 460 PRINT SPC(19)" {6}PRESS
A NUMBER FROM{5} ";
RG 470 PRINT SPC(19)" {6}1 TO
{SPACE}8 FOR A
{7 SPACES}{5} ";
JK 480 PRINT SPC(19)" {6}DIFFE
RENT SCROLL{3 SPACES}
{5} ";
XD 490 PRINT SPC(19)" {6}DIREC
TION. PRESS C {5} ";
GD 500 PRINT SPC(19)" {6}TO CO
NTINUE....{4 SPACES}{5}
";
HC 510 PRINT SPC(19)LEFT$(SP$,
21);
KH 520 GETA$:IFA$="C"THEN580
XX 530 IF A$="" THEN520
AF 540 V= VAL(A$):IF V<1 OR V>
8 THEN520
GR 550 IF V=3 THEN SYS EN,2,32
0:GOTO440
RF 560 IF V=7 THEN SYS EN,6,32
0:GOTO440
AE 570 SYS EN,V-1,200:GOTO440
KQ 580 PRINT "{5}{CLR}":GOSUB1
110:POKE YP,23:POKE D2,
30
XG 590 PRINT"{4 SPACES}THE HOR
IZONTAL AND VERTICAL"
SB 600 PRINT" SCROLLING SPEED
{SPACE}CAN BE CHANGED"
FA 610 PRINT"FOR....":SYS EN,
0,40
ES 620 POKE D1,1:POKE D2,1:REM
ADJUST DELAY TIMING VA
LUE

```

```

KR 630 PRINT SPC(11)"FASTER SC
ROLLING...."
FJ 640 SYS EN,0,88:SYS EN,2,32
0
QX 650 POKE D1,40:POKE D2,40
BX 660 PRINT SPC(8)"OR SLOWER
{SPACE}SCROLLING...."
DB 670 SYS EN,0,88:SYS EN,6,24
0
JQ 680 POKE YP,19:POKE D1,18:P
OKE D2,18:POKE WR,0:PRI
NT"{5}{CLR}";:GOSUB1120
JH 690 X1=11:Y1=10:GOSUB1170
RB 700 PRINT "{6}YOU CAN ALSO
{SPACE}HAVE{5} ";
AP 710 PRINT SPC(21)" {6}HORIZ
ONTAL SCROLL{5} ";
CH 720 PRINT SPC(21)" {6}WRAP
{SPACE}ON....{6 SPACES}
{5} ";
RF 730 SYS EN,2,320
PD 740 X1=11:Y1=14:GOSUB1170:P
RINT "{YEL}{2 SPACES}HI
T A KEY.... {5}
{2 SPACES}"
PM 750 GET A$:IF A$="" THEN750
MH 760 X1=19:Y1=13:GOSUB1170:P
RINT "{6} OR OFF."
FQ 770 X1=11:Y1=14:GOSUB1170:P
RINT "{5}++++++"
JR 780 POKE WR,1:SYS EN,6,320
XH 790 POKE SP,1:REM SET TO 8
{SPACE}PIXEL SCROLLING
BB 800 POKE D1,30:POKE D2,30
HB 810 PRINT "{5}{CLR}":GOSUB11
20
AM 820 X1=9:Y1=9:GOSUB1170
XQ 830 PRINT "{6}YOU CAN SCROL
L EIGHT{5} ";
KB 840 PRINTSPC(18)" {6}PIXELS
AT A TIME... {5} ";
AQ 850 PRINTSPC(18)" {6}ENTER
{SPACE}A NUMBER
{6 SPACES}{5} ";
KQ 860 PRINTSPC(18)" {6}BETWEE
N 1 AND 8.{4 SPACES}{5}
";
DA 870 PRINTSPC(18)" {6}PRESS
{SPACE}C TO CONTINUE.
{5} "
EQ 880 GET A$:IF A$="C"THEN930
XS 890 V=VAL(A$):IF V<1 OR V>8
THEN880
CR 900 IF V=3 THEN SYS EN,2,40
:GOTO810
PF 910 IF V=7 THEN SYS EN,6,40
:GOTO810
CX 920 SYS EN,V-1,25:GOTO810
CK 930 POKE YP,23:POKE SP,0:PO
KE D1,18:POKE D2,18:POK
E XP,200
QA 940 PRINT "{5}{CLR}":GOSUB11
10:POKE D2,30
GJ 950 PRINT "{5 SPACES}PIXEL M
OVER SUPPORTS THESE"
KP 960 PRINT "{2 SPACES}FEATUR
E S FOR OPTIMAL COMPATIBI

```

```

LITY"
CE 970 PRINT "{2 SPACES}AND FLE
XIBILITY:";PRINT
JG 980 PRINT "{2 SPACES}{4}*{8}
YOU CAN CHANGE THE SCR
EEN MEMORY"
DR 990 PRINT "{4 SPACES}OR THE
{SPACE}VIDEO BANK AND P
IXEL MOVER"
XF 1000 PRINT "{4 SPACES}WILL A
DAPT TO THESE CHANGES.
"
CB 1010 PRINT:PRINT "{2 SPACES}
{4}*{8} THE {3}PIXEL M
OVER RELOCATOR{8} WILL
"
RG 1020 PRINT "{4 SPACES}RELOCA
TE A COPY OF PIXEL MOV
ER TO"
QF 1030 PRINT "{4 SPACES}ANY LO
CATION IN MEMORY."
QA 1040 PRINT:PRINTSPC(5)"{6}H
IT {YEL}{RVS} SPACE
{OFF}{6} TO RESTART TH
IS"
PD 1050 PRINTSPC(3)"DEMO. HIT
{SPACE}ANY OTHER KEY T
O QUIT."
XA 1060 SYS EN,0,40
AE 1070 GET A$:IF A$="" THEN10
70
XB 1080 IF A$="" THEN230
GH 1090 POKE YP,24:SYS TK:SYS
{SPACE}65418:SYS 65409
:END
CC 1100 REM ----
FG 1110 X1=0:Y1=24:GOSUB1170:R
ETURN:REM PLOT CURSOR
{SPACE}TO BOTTOM OF SC
REEN
AS 1120 POKE YP,PEEK(YP)AND239
QD 1130 PRINT "{HOME}{A}{38 R}
{S}";
JP 1140 FORI=1 TO 23:PRINT "{Q}
++++++"
++++++{W}";:
NEXT
PD 1150 ZZ=SC+960:POKE ZZ,109:
FOR I=ZZ+1 TO ZZ+38:PO
KE I,113:NEXT:POKE ZZ+
39,125
KR 1160 PRINT "{HOME}";:POKE YP
,PEEK(YP)OR16:RETURN
BH 1170 POKE X,1:POKEY, Y1:SYS5
8636:RETURN

```

RELOCATOR

```

0801:0E 08 6E 19 9E 20 28 32 71
0809:30 36 34 29 00 00 00 78 50
0811:A2 FF 9A 20 A3 FD 20 15 32
0819:FD 20 5B FF 58 A2 09 BD B8
0821:6F 0D 9D 00 80 CA 10 F7 27
0829:A9 05 20 D2 FF A9 93 20 6E
0831:D2 FF A9 00 20 90 FF A9 CC
0839:06 8D 20 D0 8D 21 D0 A2 F5
0841:02 A0 09 18 20 F0 FF A9 8B
0849:0F 8D 86 02 A9 AF 20 60 E1
0851:0C A9 98 A0 0D 20 1E AB BF

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0859:20 68 0C A9 0B 8D 86 02 4D
0861:A9 B7 20 60 0C 18 A0 02 42
0869:A2 06 20 F0 FF A9 B5 A0 12
0871:0D 20 1E AB 18 A0 00 A2 74
0879:09 20 F0 FF AD 6E 0D F0 66
0881:03 4C EB 08 A9 DA A0 0D 2B
0889:20 1E AB A0 04 A2 0A 18 87
0891:20 F0 FF A9 03 A0 0E 20 5F
0899:1E AB 20 73 0C 20 73 0C B2
08A1:20 E4 FF F0 FB A9 23 A0 77
08A9:0E 20 1E AB A9 05 A6 BA B0
08B1:A0 FF 20 BA FF A9 10 A2 1B
08B9:78 A0 0D 20 BD FF A9 00 13
08C1:20 D5 FF A5 90 30 04 29 28
08C9:0F F0 1F A9 31 A0 0E 20 64
08D1:1E AB A9 49 A0 0E 20 1E 41
08D9:AB 20 E4 FF C9 59 F0 07 01
08E1:C9 4E D0 F5 6C FC FF 4C 87
08E9:10 08 A9 01 8D 6E 0D A9 33
08F1:5A A0 0E 20 1E AB A9 00 0E
08F9:8D ED 0C 85 CC A9 01 8D C2
0901:86 02 20 E4 FF F0 FB C9 AE
0909:0D F0 21 C9 14 F0 0D A2 BF
0911:0F DD 88 0D F0 20 CA 10 B1
0919:F8 4C 03 09 AD ED 0C F0 D9
0921:E1 A9 14 20 D2 FF CE ED 35
0929:0C 4C 03 09 AD ED 0C C9 4C
0931:04 90 CF 4C 58 09 AE ED 5A
0939:0C 9D EE 0C 20 D2 FF EE 92
0941:ED 0C AD ED 0C C9 04 D0 42
0949:B9 20 E4 FF C9 14 F0 CC 2A
0951:C9 0D F0 D8 4C 4A 09 A9 7E
0959:01 85 CC A9 20 20 D2 FF A8
0961:AE EE 0C AC EF 0C 20 78 3B
0969:0C 8D E6 0C AE F0 0C AC 80
0971:F1 0C 20 78 0C 8D E5 0C 79
0979:20 73 0C A9 71 A0 0E 20 DE
0981:1E AB 20 9B 0A A9 81 A0 E5
0989:0E 20 1E AB A9 00 85 CC 4E
0991:8D ED 0C 20 E4 FF C9 0D 31
0999:F0 26 C9 14 F0 2A C9 20 0C
09A1:90 F1 C9 80 B0 03 4C AE 92
09A9:09 C9 A0 09 E6 AE ED 0C A9
09B1:E0 10 F0 DF 20 D2 FF 9D 3E
09B9:B3 0E EE ED 0C 4C 94 09 A9
09C1:AD ED 0C F0 CE 4C DE 09 25
09C9:AE ED 0C F0 C6 A9 14 20 64
09D1:D2 FF A9 00 9D B3 0E CE 29
09D9:ED 0C 4C 94 09 A9 01 85 2F
09E1:CC A9 20 20 D2 FF 20 73 15
09E9:0C A9 95 A0 0E 20 1E AB 02
09F1:AE ED 0C A0 0D B9 AF 0E B6
09F9:9D B3 0E EE ED 0C E8 C8 B2
0A01:C0 04 D0 F1 18 AD E7 0C 03
0A09:6D E9 0C 8D F4 0C AD E8 C4
0A11:0C 6D EA 0C 8D F5 0C AD AE
0A19:E9 0C AE EA 0C 85 FD 86 A2
0A21:FE A9 00 85 90 AD ED 0C 9A
0A29:A2 B3 A0 0E 20 BD FF A9 12
0A31:05 A6 BA A0 05 20 BA FF F0
0A39:20 C0 FF A5 90 30 04 29 5E
0A41:0F F0 03 4C AB 0C A2 05 16
0A49:20 C9 FF AD E5 0C 20 D2 2D
0A51:FF AD E6 0C 20 D2 FF A0 5B
0A59:00 B1 FD 20 D2 FF A5 90 0E
0A61:30 04 29 F0 F0 03 4C AB 7C
0A69:0C E6 FD D0 02 E6 FE 38 EB
0A71:AD F4 0C E5 FD 8D F3 0C 93
0A79:AD F5 0C E5 FE 0D F3 0C E1
0A81:B0 D7 A9 05 20 C3 FF 20 99

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0A89:CC FF 20 73 0C 20 73 0C 13
0A91:A9 A1 A0 0E 20 1E AB 4C F4
0A99:DA 08 20 1E 0C 20 A4 0A 37
0AA1:4C D6 0B 18 AD E3 0C 6D F6
0AA9:E7 0C 8D EB 0C AD E4 0C 12
0AB1:6D E8 0C 8D EC 0C A0 00 E9
0AB9:A2 00 B1 FD DD 3B 0D F0 1C
0AC1:2B E8 E0 30 D0 F6 A2 00 6C
0AC9:DD F8 0C F0 10 E8 E0 4F D0
0AD1:D0 F6 91 FB 20 E0 0B 20 B8
0AD9:F4 0B 4C B7 0A 91 FB 20 DE
0AE1:E0 0B B1 FD 91 FB 20 E0 DC
0AE9:0B 4C D8 0A 91 FB 20 E0 EF
0AF1:0B B1 FD 8D ED 0C 20 E6 57
0AF9:0B B1 FD 8D EE 0C 20 E6 67
0B01:0B 38 AD EB 0C ED ED 0C 1F
0B09:8D EF 0C AD EC 0C ED EE A0
0B11:0C 0D EF 0C 90 50 38 AD 13
0B19:E3 0C ED ED 0C 8D EF 0C 43
0B21:AD E4 0C ED EE 0C 0D EF 59
0B29:0C B0 3B 38 AD ED 0C ED 87
0B31:F3 0C 8D EF 0C AD EE 0C ED
0B39:ED E4 0C 8D F0 0C 18 AD 6F
0B41:E5 0C 6D EF 0C 8D F1 0C 80
0B49:AD E6 0C 6D F0 0C 8D F2 0E
0B51:0C A0 00 AD F1 0C 91 FB 4F
0B59:20 ED 0B AD F2 0C 91 FB 1E
0B61:2D ED 0B 4C D8 0A A0 00 59
0B69:AD ED 0C 91 FB 20 ED 0B B3
0B71:AD EE 0C 91 FB 20 ED 0B FB
0B79:4C D8 0A A0 00 B1 FD 8D 87
0B81:ED 0C C8 B1 FD 8D EF 0C D7
0B89:C8 B1 FD 8D EE 0C C8 B1 F3
0B91:FD 8D F0 0C 38 AD EF 0C 4D
0B99:ED E3 0C 8D EF 0C AD F0 F5
0BA1:0C ED E4 0C 8D F0 0C 18 F6
0BA9:AD EF 0C 6D E5 0C 8D EF 55
0BB1:0C AD F0 0C 6D E6 0C 8D C4
0BB9:F0 0C A0 00 AD ED 0C 91 2E
0BC1:FB C8 AD EF 0C 91 FB C8 24
0BC9:AD EE 0C 91 FB C8 AD F0 5C
0BD1:0C 91 FB C8 60 20 1E 0C 2A
0BD9:AD F7 0C 20 33 0C 60 20 F2
0BE1:E6 0B 4C ED 0B E6 FD D0 57
0BE9:E2 E6 FE 6D E6 FB D0 02 6B
0BF1:E6 FC 60 38 A5 FB ED E9 2D
0BF9:0C 8D ED 0C A5 FC ED EA DF
0C01:0C 8D EE 0C 38 AD ED 0C 81
0C09:ED E7 0C 8D EF 0C AD EE 66
0C11:0C ED E8 0C 0D EF 0C B0 79
0C19:01 60 68 68 60 AD E3 0C EA
0C21:AE E4 0C 85 FD 8E FE AD 59
0C29:E9 0C AE EA 0C 85 FB 86 B2
0C31:FC 60 8D ED 0C A9 00 8D 05
0C39:EE 0C 18 AD E9 0C 6D ED F1
0C41:0C 85 FB AD EA 0C 6D EE 6C
0C49:0C 85 FC 18 AD E3 0C 6D 6C
0C51:ED 0C 85 FD AD E4 0C 6D 7A
0C59:EE 0C 85 FE 4C 7C 0B A2 99
0C61:17 20 D2 FF CA D0 FA 38 2F
0C69:20 F0 FF E8 A0 09 18 4C 02
0C71:F0 FF A9 D0 4C D2 FF 8E 44
0C79:F4 0C 8C F5 0C A0 00 AD 90
0C81:F4 0C D9 88 0D F0 03 C8 D5
0C89:D0 F8 98 0A 0A 0A 0A 8D 16
0C91:F3 0C A2 00 AD F5 0C DD 36
0C99:88 0D F0 03 E8 D0 F8 8A 8E
0CA1:0D F3 0C 8D F3 0C AD F3 B6
0CA9:0C 60 A9 05 20 C3 FF 20 95
0CB1:CC FF 20 73 0C A9 31 A0 75

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0CB9:0E 20 1E AB A9 49 A0 0E 21
0CC1:20 1E AB 20 E4 FF C9 59 FC
0CC9:F0 07 C9 4E D0 F5 4C 10 41
0CD1:08 4C 05 0A A9 00 8D 04 AE
0CD9:80 8D 05 80 8D 06 80 6C 30
0CE1:FC FF B0 CA 00 40 4F 05 DF
0CE9:00 40 00 00 00 00 00 12
0CF1:00 00 00 00 00 00 1F A9 F1
0CF9:A2 A0 A5 B5 A1 B1 A4 B4 6D
0D01:A6 B6 B0 F0 90 C9 C5 D5 4E
0D09:C1 D1 D0 A6 B6 85 95 81 75
0D11:91 84 94 86 96 C6 D6 E6 74
0D19:F6 C0 C4 CC E0 E4 EC E9 A2
0D21:E5 F5 E1 F1 69 65 75 61 34
0D29:71 30 10 29 25 35 21 31 0E
0D31:09 05 15 01 11 49 45 55 51
0D39:41 51 AD BD B9 AC BC 20 F3
0D41:CD DD D9 AE BE 4C 6C 8D 6D
0D49:9D 99 8C 8E CE DE EE FE E1
0D51:CC EC ED FD F9 6D 7D 79 A4
0D59:2D 3D 39 0D 1D 19 4D 5D 96
0D61:59 2C 2E 3E 6E 7E 4E 5E 45
0D69:0E 1E A9 A2 A0 00 D5 0C 2E
0D71:10 08 C3 C2 CD 38 30 50 3A
0D79:49 58 45 4C 20 4D 4F 56 E6
0D81:45 52 2E 4F 42 4A 2A 30 4D
0D89:31 32 33 34 35 36 37 38 9B
0D91:39 41 42 43 44 45 46 48 67
0D99:08 12 98 20 50 49 58 45 EE
0DA1:4C 20 4D 4F 56 45 52 20 15
0DA9:52 45 4C 4F 43 41 54 4F D3
0DB1:52 20 92 00 9A 43 4F 50 20
0DB9:59 52 49 47 48 54 20 31 B7
0DC1:39 39 31 20 42 59 20 48 EE
0DC9:4F 4E 47 20 50 48 41 4D 7D
0DD1:2F 56 39 31 31 31 32 32 38
0DD9:00 05 49 4E 53 45 52 54 EB
0DE1:20 57 4F 52 4B 20 44 49 9D
0DE9:53 4B 20 43 4F 4E 54 41 56
0DF1:49 4E 49 4E 47 20 50 49 F6
0DF9:58 45 4C 20 4D 4F 56 45 B6
0E01:52 00 54 48 20 45 20 50 49
0E09:52 45 53 53 20 41 20 4B D0
0E11:45 59 20 54 4F 20 43 4F 40
0E19:4E 54 49 4E 55 45 2E 2E C9
0E21:2E 00 9F 4C 4F 41 44 49 5E
0E29:4E 47 2E 2E 2E 2E 0D 00 2B
0E31:0D 9E 2D 2D 2D 2D 20 44 96
0E39:49 53 4B 20 45 52 52 4F A1
0E41:52 20 2D 2D 2D 2D 0D 00 3F
0E49:54 52 59 20 41 47 41 49 44
0E51:4E 20 28 59 2F 4E 29 3F 7B
0E59:00 0D 9A 52 45 4C 4F 43 6E
0E61:41 54 45 20 41 44 44 52 D3
0E69:45 53 53 20 3A 20 24 00 04
0E71:9F 52 45 4C 4F 43 41 54 BD
0E79:49 4E 47 2E 2E 2E 0D 00 DD
0E81:0D 9A 53 41 56 45 20 46 97
0E89:49 4C 45 20 4E 41 4D 45 5F
0E91:3A 20 05 00 9F 53 41 56 96
0E99:49 4E 47 2E 2E 2E 2E 00 4D
0EA1:41 4E 4F 54 48 45 52 20 30
0EA9:28 59 2F 4E 29 00 2C 50 EC
0EB1:2C 57 00 00 00 00 00 00 B9
0EB9:00 00 00 00 00 00 00 00 D5
0EC1:00 00 00 00 00 00 00 00 DD

```

Hong Pham is the author of Ramdrive 64 (November 1991). He moves pixels in Antigonish, Nova Scotia, Canada.

BATCH FILE 64

By Cameron Kaiser

Most computers, with the exception of the 64 and 128, offer a provision for running batch files. A batch file contains one or more instructions that are executed as if they were being typed on the keyboard. IBM users will recognize a batch file called AUTOEXEC, the one which automatically executes as the computer is booted.

A batch file is useful because it allows the computer to store and remember sequences and commands for you. Then every time that file is run, the computer executes those commands. For example, you could create a batch file to run a program that requires a special way of starting; it might call for a SYS address that's difficult to remember. All you'd have to do is load the batch file, and it would load the program and issue the necessary SYS command.

Typing It In

Batch File 64 gives you the power to create batch files that can run on their own, without the batch file creator. The program consists of two sections: BF64, a BASIC program, and Pbox, a machine language routine.

The first part, BF64, is written entirely in BASIC. To avoid typing errors, use The Automatic Proofreader to enter it. See "Typing Aids" elsewhere in this section. Be sure to save a copy of BF64 before you run it.

Pbox is the machine language portion of the program. To enter it, use MLX, our machine language entry program; see "Typing Aids" again. Be sure to save Pbox on the same disk as BF64. Save it with the filename PBAX because BF64 loads that filename when it executes.

Getting Started

To begin, load and run BF64. On the opening screen, you'll see a reminder about a couple of POKEs and the message indicating 1278 free bytes. We'll look at these later.

You'll then see a prompt that indicates line 1. This is where you enter the first line of your batch file. This can be any legal command, program line, or code found in Commodore BASIC. The only stipulation is that a line must

not exceed 75 characters in length.

When you've finished with the first line, press Return. The computer will pause while it commits the statement to memory. Then a prompt for line 2 will appear.

Enter the second line of your batch file, remembering the 75-character limit. Press Return at the end of the line. Continue in this manner until you've entered all of your desired commands. The computer won't let you exceed the 1278 bytes that are available for these commands. If you exceed that number, you'll get an error message. To determine how many bytes remain, press Ctrl-B on an empty line.

Type Carefully

Before you press Return, be very sure that what you have onscreen is what you want to see echoed in your batch file. You cannot edit a line once it has been entered into memory.

Another thing to be aware of is that the computer acts as though it were in perpetual quote mode, that odd state where the 64 echoes cursor commands as reversed characters. If you try to cursor back to something on the line you're working on, all you'll get is a bunch of reversed control codes. To go back and change something, use the Del key.

Because the batch file program replaces part of the 64's operating system, you need to turn off Batch File 64 before running some programs. To do this, make sure that the last line of your batch file looks like this next line.

POKE 788,49:POKE 789,234: final command

In this case, *final command* is the last command of the program. For example, to run a BASIC program called Spectre, you could use the batch file below. Since RUN is the last command, enter the POKEs just before it.

**LOAD "SPECTRE",8
POKE788,49: POKE789,234: RUN**

When you've finished entering your batch file, press Ctrl-A on a blank line. The computer will ask you if you really want to stop. If you've finished entering commands, press Y. If you wish to continue, press N.

Saving Files

Insert a disk to save the batch file. The computer will prompt you for a filename and a two-character ID. Enter these. The computer will process the code, save it to disk, and reset itself.

Running Files

To try out your batch file, load the filename with the ,8,1 extension. If all goes well, you should see SYSC:NEW and the commands of the batch file printed rapidly to the screen and entered into the computer.

Every effort has been made to make sure that Batch File 64 won't interfere with any program it loads. That doesn't mean that it's foolproof, however. Any program that modifies locations above \$CA00 (51712) will cause erratic behavior at best and a complete system crash at worst unless the batch file program has been taken out of the way. If you want to load a program that does this, use a batch file like the one below.

**IF A THEN SYS address
A=1: LOAD "filename",8,1
POKE788,49: POKE789,234: RUN**

In this example, *filename* is the machine language program being called, and *address* is its starting address.

Deleting Files

To delete a batch file, you must erase three files. The first filename is the one that you originally named and saved, the second is the same with M added as its first letter, and the third is BS plus the two-letter ID. For example, if the batch file you created was called ZORBA and the ID was ZB, then you would have to delete the files named ZORBA, MZORBA, and BSZB.

BF64

```
CP 1 REM COPYRIGHT 1992 - COMP  
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AQ 5 IFA=0THENA=1:LOAD"PBAX",8  
,1  
AX 10 POKE53272,23:POKE648,4:P  
OKE56576,151:PRINT"{CLR}  
{7}{N}{H}{K}";:POKE53280  
,14:POKE53281,6  
XP 20 PRINT"{3 DOWN}BATCH FILE  
CREATOR{DOWN}"  
RB 30 PRINT"ENTER POKE788,49:P
```

```
OKE789,234:"  
FX 35 PRINT"BEFORE THE FINAL C  
OMMAND."  
KJ 40 PRINT  
AH 50 PRINT"{DOWN}1278 BYTES F  
REE":PRINT:BF=1278:LN=1  
HD 60 SPIEL$=""  
HF 70 PRINTLN"{LEFT}:";:POKE20  
4,.  
FR 80 POKE198,0:WAIT198,1:GETA  
S  
JX 90 IFLEN(SPS)=0AND(A$=CHR$(  
13)ANDAS=CHR$(20))THEN80  
MK 92 IFLEN(SPS)=75ANDAS<>CHR$(  
20)ANDAS<>CHR$(13)THEN8  
0  
SE 93 IFA$=CHR$(13)THEN130  
KR 94 IFA$="{A}"THENPOKE204,1:  
POKE212,.:PRINT" ":GOTO1  
90  
KB 95 IFA$="{B}"THENPOKE204,1:  
POKE212,.:PRINT" ":GOTO1  
82  
PK 100 POKE212,1:PRINTAS;  
XH 110 IFA$<>CHR$(20)ANDAS<>CH  
R$(13)THENSPP$=SP$+A$:GO  
TO80  
FS 120 IFA$=CHR$(20)THENSPP$=LE  
FT$(SP$,LEN(SPS)-1):GOT  
O80  
MD 130 POKE204,1:POKE212,.:PRI  
NT" ":SP$=SP$+CHR$(13)  
PD 140 Z=LEN(SPIEL$):IFBF-Z<=0  
THENPRINT"OVERFLOW -- R  
ETYPE LINE OR QUIT":GOT  
O60  
SH 150 FORX=0TOLEN(SPS)-1  
FC 160 POKE51969+(1278-BF),ASC  
(MID$(SP$,X+1,1)+CHR$(0  
)):BF=BF-1  
PA 170 NEXTX:POKE51969+(1278-B  
F),0  
XP 180 LN=LN+1:GOTO60  
RC 182 PRINT"{DOWN}{LEFT}"BF"BY  
TES FREE{DOWN}":GOTO60  
RJ 190 PRINT"{DOWN}VERIFY -- A  
RE YOU FINISHED? (Y/N) "  
HP 200 WAIT198,1:GETAS:IFA$<>"  
Y"ANDAS<>"N"THEN200  
MS 210 IFA$="N"THENPRINT:GOTO6  
0  
RC 220 PRINT"{CLR}{9 DOWN}ENTE  
R A FILENAME FOR THIS B  
ATCH FILE:"  
FX 222 OPEN2,0:INPUT#2,A$:CLOS  
E2:PRINT  
GE 230 PRINT"ENTER AN 2 CHARAC  
TER ID:"POKE204,.  
PR 240 WAIT198,1:GETCS:PRINTCS  
:WAIT198,1:GETDS:PRINT  
DS:POKE204,1:POKE198,0  
XA 250 Q$="M"+A$:SYS57812Q$,8,  
1:POKE193,0:POKE194,202  
:POKE174,253:POKE175,20  
7  
SC 260 SYS62954:POKE51699,ASC(  
"S"):POKE51700,ASC(CS):  
POKE51701,ASC(DS)
```

PROGRAMS

```

AB 270 OPEN1,8,2,"0:"+A$+",P,W
"
QC 280 PRINT#1,CHR$(0)CHR$(1);
:FORX=51389TO51711:PRIN
T#1,CHR$(PEEK(X));:NEXT
CR 290 CLOSE1
JE 300 PRINT"{CLR}{BLU}10 IFA=
0THENA=1:LOAD"CHR$(34)Q
$CHR$(34)",8,1"
HC 301 PRINT"20 A$="CHR$(34)"S
YSC:NEW"CHR$(34)"+"CHR$(
13):POKE198,9"
MH 310 PRINT"30 FORX=1TO9:POKE
630+X,ASC(MID$(A$,X,1))
:NEXT:C=51712:POKE828,0
"
AK 320 PRINT"40 SYS828"
XC 330 PRINT"SAVE"CHR$(34)"BS"
CSD$CHR$(34)",8"
KX 340 PRINT"{3 DOWN}SYS64738"
XD 350 POKE198,7:POKE631,19:FO
RX=1TO6:POKE631+X,13:NE
XTX:NEW
  
```

BPAX

```

C8BD:02 02 02 02 02 02 02 02 4F
C8C5:02 02 02 02 02 02 02 02 57
C8CD:02 02 02 02 02 02 02 02 5F
C8D5:02 02 02 02 02 02 02 02 67
C8DD:02 02 02 02 02 02 02 02 6F
C8E5:02 02 02 02 02 02 02 02 77
C8ED:02 02 02 02 02 02 02 02 7F
C8F5:02 02 02 02 02 02 02 02 87
C8FD:02 02 02 02 02 02 02 02 8F
C905:02 02 02 02 02 02 02 02 98
C90D:02 02 02 02 02 02 02 02 A0
C915:02 02 02 02 02 02 02 02 A8
C91D:02 02 02 02 02 02 02 02 B0
C925:02 02 02 02 02 02 02 02 B8
C92D:02 02 02 02 02 02 02 02 C0
C935:02 02 02 02 02 02 02 02 C8
C93D:02 02 02 02 02 02 02 02 D0
C945:02 02 02 02 02 02 02 02 D8
C94D:02 02 02 02 02 02 02 02 E0
C955:02 02 02 02 02 02 02 02 E8
C95D:02 02 02 02 02 02 02 02 F0
C965:02 02 02 02 02 02 02 02 F8
C96D:02 02 02 02 02 02 02 02 01
C975:02 02 02 02 02 02 02 02 09
C97D:02 02 02 02 02 02 02 02 11
C985:02 02 02 02 02 02 02 02 19
C98D:02 02 02 02 02 02 02 02 21
C995:02 02 02 02 02 02 02 02 29
C99D:02 02 02 02 02 02 02 02 31
C9A5:02 02 02 02 02 02 02 02 39
C9AD:02 02 02 02 02 02 02 02 41
C9B5:02 02 02 02 02 02 02 02 49
C9BD:02 02 02 A9 00 20 90 FF 4F
C9C5:A9 02 A6 BA A0 01 20 BA 33
C9CD:FF A9 04 A2 35 A0 02 20 C6
C9D5:BD FF A2 FF A0 FF A9 00 F4
C9DD:20 D5 FF 86 2D 84 2E A9 E0
C9E5:00 85 7A A9 08 85 7B 20 32
C9ED:60 A6 4C AE A7 42 4F 4F 04
C9F5:54 A9 0A 85 14 A9 99 E0 13
C9FD:84 FF 0E A9 00 85 FD A9 EB
CA05:CB 85 FE A9 19 8D 14 03 86
CA0D:A9 CA 8D 15 03 A9 01 85 73
CA15:FB 85 FC 60 A5 FC C9 00 64
  
```

```

CALD:F0 14 A4 FB B1 FD 8D 77 9C
CA25:02 C8 D0 02 E6 FE 85 FC 63
CA2D:84 FB A9 01 85 C6 4C 31 5A
CA35:EA 00 FF 00 7F BB FF 00 2B
CA3D:FF 00 18 00 00 00 00 00 D5
  
```

Cameron Kaiser writes batches of files and other interesting programs in La Mesa, California.

TYPING AIDS

MLX, our machine language entry program for the 64 and 128, and *The Automatic Proofreader* are utilities that help you type in Gazette programs without making mistakes. To make room for more programs, we no longer include these labor-saving utilities in every issue, but they can be found on each *Gazette Disk* and are printed in all issues of *Gazette* through June 1990.

If you don't have access to a back issue or to one of our disks, write to us, and we'll send you free copies of both of these handy programs. We'll also include instructions on how to type in Gazette programs. Please enclose a self-addressed, stamped envelope.

Write to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

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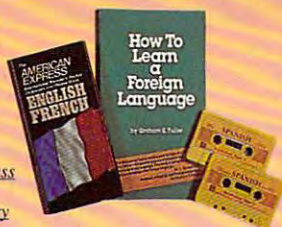
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PACKARD BELL 520SX

Whether you're thinking about dipping your toes in the home-computing waters or you're already wet and looking to get wetter, the Packard Bell 520SX might be the machine you need. It's easy enough for a novice to use, yet it's powerful enough and packaged with sufficient software to offer a potential step up.

The machine comes with enough software installed for you to start computing quickly, and setup is a breeze. If you've ever set up a computer before, you should be able to handle this one with your eyes closed. The Quick Start Guide covers the most basic MS-DOS commands and contains useful illustrations that show how everything should be put together. If you're a brave and adventurous first-timer, you'll be glad to find that the back of the computer is fairly well marked, with both icons and abbreviations showing where everything is supposed to go. The Packard Bell comes with another User's Manual that goes into a lot more detail than you'll probably ever need. But hang on to it—your computer repair person will need this book to make repairs and upgrades.

The case is sturdy, and it opens easily to a very serviceable layout. Because the 520SX is so well equipped, there are only two reasons you'd ever need to get into the case: to add more memory or to add another expansion card. The case has a warranty seal on it, so if you upgrade before your warranty runs out, you may void it.

The 520SX comes with 2MB of SIMMs (Single Inline Memory Modules) and is up-

gradable to 16MB. The memory modules are easily accessible and should take the novice computer user about an hour to install. Use only high-quality 265K, 1MB, or 4MB × 9MB SIMMs; otherwise, you could have problems with some programs.

backup or remove one of your floppy drives to get a tape backup to work. If Packard Bell had placed its on/off switch somewhere else on the computer, you'd have one more drive bay.

Today's all-in-one motherboards, such as the one



Easy to set up, easy to use, powerful, and packaged with plenty of software: the Packard Bell 520SX.

Adequate ventilation can be a concern if you're using your computer in a warm environment. With its roomy case, the Packard Bell 520SX looks as if it will keep cool satisfactorily. Its fan is moderately noisy but not disturbing. Because this machine comes with a 125MB hard drive, a tape backup would be a good next purchase. If you're good with a blowtorch, you might wedge a tape backup system somewhere under the 5¼-inch drive. If not, you may have to look toward an external tape

that comes with the Packard Bell 520SX, have several advantages and disadvantages. The main disadvantage is that if a component on the motherboard goes bad, you could have to replace the entire motherboard—a costly proposition. However, manufacturers say the new boards are cooler and more efficient. (I'd imagine that they're also less expensive to manufacture.) The advantage to the consumer is a smaller computer on the desktop. With so many ports located on the mother-

board, including the keyboard, mouse, parallel, and two serial ports, you have four 16-bit expansion slots left on your computer. The 520SX comes with a modem already installed, leaving you three open expansion slots.

The cost of expanding this computer is only as expensive as your best deal, but be wary of too good a deal. You get what you pay for, and sometimes problems don't crop up until it's too late to point fingers. Sixteen megabytes of RAM should be adequate for most of today's needs, and it will probably be a few more years before most programs you run will be able to utilize that much memory. If you want to add more drives, you'll probably have to replace existing drives with bigger ones or look at external drives. If Packard Bell would just move the power switch, the expansion capabilities would be the same as for most other computers on the market.

The monitor is a high-resolution, 14-inch Super VGA type that has a good set of program utilities to run a variety of software in 1024 × 768 mode. When I ran the 1024 × 768 mode from DOS and then tried to run some other software, the system froze up every time. The Windows 3.0 screen drivers installed easily, however, and Windows ran without a hitch.

The 520SX comes with several nice features. It has its own unique Windows-like opening screen, which experienced computer users will probably discard quickly in favor of Windows 3.0 or their own menu programs. However, this program is an excellent tool for beginners because it protects them from encountering the DOS prompt, which can be a harrowing experi-

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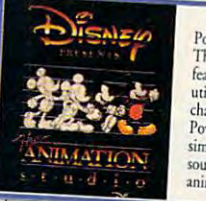


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ence for first-time users.

LotusWorks comes installed and ready to go. Works is a combination word processor with spelling checker and thesaurus, spreadsheet with graphics, database, and communications package. The documentation for Works is printed by Lotus. You'll probably want to get a third-party book on Works; this documentation is awfully dry. The reference guide has a large index which, if scanned, can be more advantageous than reading the book cover to cover.

This computer also sports a mouse and internal modem/fax, both of which worked well in software packages I tested. To test the mouse and modem, I dialed out on Prodigy, which is included with the 520SX. The fax capabilities took a little while to get up and running, and the documentation didn't always match what the software was showing on the screen. I found it easier to figure out using trial and error.

Packard Bell computers seem to be some of the lowest-priced computers around that offer a basic software set to help get you going. Because these computers are sold primarily through deep-discount department stores, the only technical support is by telephone.

Even so, if you want a good starter computer or a powerful upgrade, give the Packard Bell 520SX a look. It's easy to set up and use, and it comes with enough software to satisfy the average home computer user.

PEER PLAUT

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100 COMPUTE MAY 1992

KID PIX

Brøderbund has come up with another winner in Kid Pix, its well-received kids' paint program available previously for Macintosh computers. The IBM version adds sound to sight, which doubles the kid appeal and makes it fun for adults, too.

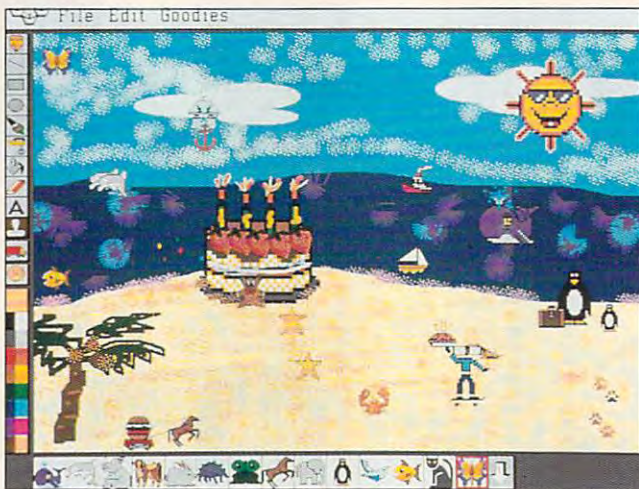
The program starts off with a bang—or, rather, a vaudeville-style cymbal shim-

who swallows the last thing you did—and he usually has something to say about it!

One feature that's bound to be very popular with kids is the rubber stamp. This is a collection of more than 100 full-color pieces of clip art that kids can select and add to their pictures. They can even edit them with the Options menu. This should be particularly useful for that large body of children (and

I argue over whose turn it is to play. Your kids will never outgrow this paint program. Even if they get too old to enjoy the sound effects, the art effects are as sophisticated as anything an adult paint program could provide.

BETH ANN MURRAY



Kids can create drawings and use clip art with Kid Pix.

my. Every time your child clicks the mouse, there's an audible response, even if it's just an exaggerated button-clicking sound. The program uses icons that are caricatures of classic paint icons, plus some special effects found only in Kid Pix.

One of my favorite special effects is the eraser. Brøderbund didn't stick with boring old white erasers—what kid would want that? For example, take the firecracker eraser, an instant hit with my children. What colors! What noise! You can even "erase" a white screen, and it's just as much fun. There's a countdown eraser and several others, but I won't reveal them and spoil your surprise. There's also an "undo" man

adults) who want to make their own art but are really dissatisfied with their own original drawings.

The talking alphabet is fun and educational because your child can see and hear letters. Text can be placed without knowledge of the keyboard; just select the letter, position the pointer, and click.

You must have sound support to get the most from Kid Pix. Brøderbund recommends the Sound Source from Walt Disney Software. In fact, Brøderbund has included a coupon worth \$10 off the Sound Source. Other sound devices are also supported.

This program is so much fun that my four-year-old and

IBM PC and compatibles; 640K RAM; EGA, MCGA, VGA, or Tandy 16-color; hard disk; mouse; sound card recommended (required for sound); supports Sound Blaster, PS/1 Sound Option, Tandy Digital Sound, and Disney Sound Source—\$59.95, School Edition—\$69.95, Lab Pack—\$139.95

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SUPERPRINT 2.0

Windows has never been known for its speed; the Windows printer drivers in particular seem glacially slow. And if you've done any serious word processing or desktop publishing, you know that the typefaces you see on-screen often look nothing like the typefaces that see print. Windows favors fonts for the printers, relying for its screen fonts on a rather simplistic default set that looks accurate only in a small number of cases.

In a rare example of software's actually speeding up system performance, SuperPrint solves both those problems at once. Incredibly, SuperPrint can make a Hewlett-Packard or compatible laser printer operate at its rated speed when printing under Windows, while at the same time giving you access to thousands of different typefaces and creating screen fonts to match them. SuperPrint intercepts a number of Windows font and print queue routines and replaces

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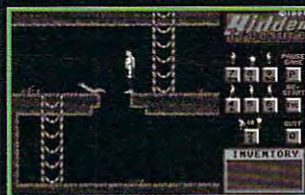


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them with its own, effectively replacing the Windows printer drivers altogether. The catch is that it works "only" on HP-compatible DeskJet, PaintJet, and laser printers; Epson-compatible dot-matrix printers; and Canon laser printers. Chances are that your own printer falls into one of these categories.

Which typeface should you use? While Adobe and Bitstream offer programs that allow you to match screen and printer fonts—albeit much slower than SuperPrint—those companies' offerings work only with their own typefaces. SuperPrint, on the other hand, supports PostScript Type 1, AGFA Intellifont, Bitstream version 2, Bitstream Fontware, DTC Nimbus Q, and HP bitmap fonts. On top of that, SuperPrint's modular design allows you to include other typeface formats if the need arises.

A suite of three programs, SuperPrint comes with several popular typeface families. The installation procedure carefully lets you know what it's doing at each step and allows you to override its choices. After installation, treat SuperPrint like a standard Windows printer driver with extra options. The SuperText and SuperQueue modules appear as icons. When a Windows application displays any text, SuperText checks to see if the font chosen in the application (which is a printer font) has a matching screen font. If not, the screen font is generated automatically.

Since a file is created for the screen font, you should always have a megabyte or two free on your hard disk (ouch!). SuperQueue allows printing to take place in the background—my preference—or in the foreground, where it's somewhat faster.

Foreground printing allows your Windows program to print at your laser printer's rated speed; my HP IIP printed at about four pages per minute.

Surprisingly, earlier versions of SuperPrint were slow at printing text but delivered spectacular per-



First-time buyers will find plenty to like and little to complain about with the Smith Corona Acer PC 330/386SX HD.

formances when paired with graphics-intensive programs. Imagine CorelDRAW! outperforming Microsoft Word for Windows! Thankfully, that all changed with version 2.0, which sucks up soft fonts into its own font cache.

Finally and emphatically, you're not left out if you rely on a dot-matrix printer. I tried SuperPrint with several Windows text editors and word processors and was very happily surprised with the dot-matrix output. Print quality was superb. If you have the free disk space, SuperPrint is that rarest of animals: software that speeds up your hardware and adds new value to old equipment.

TOM CAMPBELL

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SMITH CORONA ACER PC 330/386SX HD

At one time or another, most people acknowledge that they could use a personal computer for *something*. Of

course, today's extravagance-shy consumer can hardly justify shelling out a few thousand dollars just to organize recipes and manage the home budget. Besides, everyone knows that prices fall as technology matures—why not wait a year and buy today's PC for next to nothing?

But what if you could find a fast machine that comes equipped with everything you need to get started and promises to keep pace with the next generation of software? Well, Smith Corona offers a good reason to buy today—the Acer PC 330/386SX HD.

A prime example of mature technology at an affordable price, the Acer allows even the most uncertain beginners to fulfill their dreams of what a home computer should do almost from the moment they unpack the boxes. Smartly bundled with Smith Corona's Personal Word Processor, Microsoft Works 2.0,

MS-DOS 5.0, and an assortment of desktop accessories, the Acer arrives with this software already installed. The proud owner need only flip through the Getting Started booklet and follow the plain-English instructions. In less than ten minutes, the up-and-running Acer will take users to exactly the software they want or need to run—courtesy of a simple graphical interface. Just point and click on the adeptly fashioned icons or use the function keys to select programs to run.

Most notable of all the software packages provided, Works allows data exchange between the spreadsheet, the database, the telecommunications program, and the word processor. Even the most inexperienced user will soon grasp the principles of opening multiple windows and copying text or numbers from one window to another. The concise paperback manual explains Works' functions in all the necessary detail, but the on-disk walk-through puts a first-time user right in the thick of things. Although the constituent programs seem a bit on the simplistic side, they'll serve the average user quite well. And as an introduction to the principles of word processing, telecommunications, and spreadsheet and database management, these applications can offer a gentle and productive education.

More powerful than the Works word processor, Smith Corona's Personal Word Processor offers most of the features that anyone could need in a text editor. With its online thesaurus, 90,000-word correct-as-you-type spelling checker, and handy keyboard template to remind users of available functions, Personal Word

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The Desktop Reference accessories—accessible from Personal Word or the main menu—include a calculator, a calendar/personal scheduler, a spelling checker, and a thesaurus. Selection of these utilities from the main menu may occur via mouse pointer or function keys, but once loaded most programs operate under keyboard control. Newcomers to PCs probably won't miss extensive mouse support, but the Acer has more than enough speed to support a truly graphical environment. I have to wonder why Windows 3.0 didn't earn a spot in the initial software lineup. After all, the only thing more fun than having your brand new computer put you to work immediately is having it do so with mouse-controlled, pull-down menus. Installed later, though, Windows works its usual wonders on the traditionally somber PC operating system. Many purchasers of the Acer will want to consider a trip to the software boutique to pick up a copy of Windows for themselves.

The Acer itself will look right at home in almost any environment. While its gray and white plastic case will hardly win any beauty contests, the exterior of the machine wins some points for simple functioning. No one will mistake the tiny, recessed reset button for the larger, flush-with-the-case power button. Both of these reside on the front of the machine along with a number of indicator lights. The 3½-inch and 5¼-inch high-density disk drives sit to the right of the buttons and indicators. Interior access to the machine poses little difficulty;

the top slides off after you release two latches hidden behind the front panel.

Most people won't need more than the Acer's two internal 16-bit expansion slots, though with the addition of a sound card for game playing and an increasingly necessary modem connected to the serial port, expansion's limited to a single card. A printer connects via its own port, and the included two-button mouse also claims its own socket. The boxy Acer merits a smaller footprint for its slot sacrifices, but purchasers should note that the upper limits of expandability loom on the horizon at all times. Still, with an 80386SX machine running at 20 MHz, 2MB of RAM, and a speedy 80MB hard drive, only jaded PC veterans will complain. The .39-mm dot pitch VGA color monitor, with its nonglare, 14-inch screen, crowns the system. Its crystalline displays will rarely draw a negative comment from anyone. Both the monitor and the computer have a 12-month limited warranty that covers parts and labor.

Running a wide variety of software gave the Acer no trouble at all. Nothing—not even the latest wave of Origin high-end entertainments, not even Windows-based multitasking—caused a crash. Notoriously cranky items of hardware, such as scanners, worked on the first try, and inserting cards into the Acer's expansion slots took only moments. The Acer might not offer many slots, but, unlike some other PCs, this machine willingly accepts and surrenders expansion cards.

In every way a trooper, the Smith Corona Acer PC 330/386SX HD could serve as a model for PC congeniality. Its friendly tutorials will

quelch new-user technofears, and the bundled software affirms that computers can offer some productivity right out of the box. Recommended for the first-time computer shopper, the Acer earns high marks for convenience, reliability, and a benevolent attitude toward its users.

DAVID SEARS

Smith Corona Acer PC 330/386SX HD—\$1,995 SMITH CORONA Consumer Affairs—PC Support 839 Rte. 13 S Cortland, NY 13045 (800) 443-5748

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PICK 'N PILE

If you like Tetris-style puzzles, you'll go bonkers over Pick 'N Pile, a game of columns and tumbling shapes that leaves your mouse smoking. In this UBI Soft offering, you rearrange colored balls on the screen to create matching columns, which, upon being formed, vanish from the screen. The object is to destroy all the balls on the screen before the timer runs out.

Although all the balls in a column must be identical before they'll vanish, a column can contain bonus objects, which give you more time or boost your score when they disintegrate along with a column. For example, hourglasses add ticks to your countdown timer, bonus-point cubes add to your score, and bonus-multiplier cubes multiply the column's points by a value of 1-6.

Other extra items include bombs that destroy nearby objects, flowerpots that smash anything upon which they fall, fires that multiply rapidly and block columns, and death heads, which accelerate the timer if they touch the bottom of the screen.

Piling balls and objects isn't as easy as just shuffling them around. The higher you pile a column without support from the sides, the more likely it is to tumble. Wall cubes can be placed in supporting positions, but time is valuable, so avoid moves that don't remove balls.

All in all, Pick 'N Pile is a colorful and addictive game that'll delight any puzzle-game enthusiast.

CLAYTON WALNUM

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BARNEY BEAR GOES TO SCHOOL

Once upon a time, there were three bears—a mama bear, a papa bear, and a charming little brown bear named Barney. See Barney Bear. See Barney Bear sleep. Wake Barney Bear up. Help Barney Bear get dressed and eat his breakfast—it's time to go to school.

In Free Spirit's early learning program Barney Bear Goes to School, young children (ages 2-5) keep company with Barney Bear as he gets ready for school. When the scene moves into the classroom, children participate in a variety of gamelike activities involving letters, shapes, words, numbers, and electronic paints.

There are no written instructions to stumble over. A robotic synthesized voice tells chil-

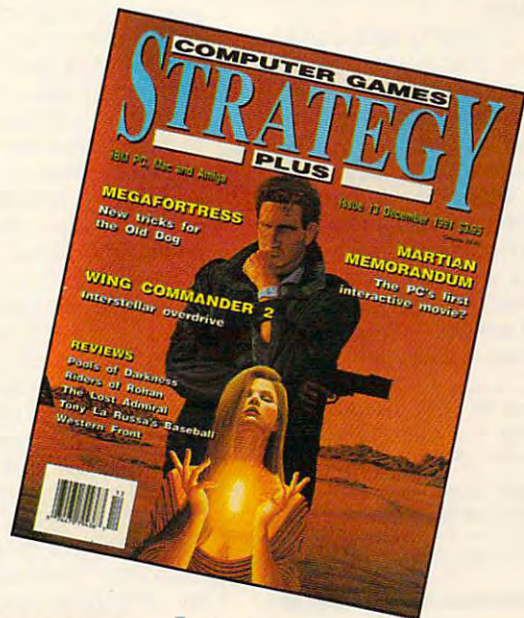
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dren how to proceed. It may suggest they find Barney a shirt of a particular color to wear or a specific breakfast food to eat. It may invite them to play an activity. Whenever youngsters carry out spoken instructions, the voice speaks encouraging words of positive reinforcement.

Even young preschoolers will have fun with Barney Bear. Kids discover several interesting objects to explore. It doesn't take them long to learn that when the cursor changes from a hand pointer to a smiley face, they can select the underlying item—simply by clicking the mouse—to hear a realistic sound effect or music clip. There are words to spell, numbers to count, and 15 black-line pictures to color. The mysterious voice counts to 10 or recites the alphabet, if prompted.

Barney Bear Goes to School is an engaging early learning program reminiscent of Brøderbund's Playroom—though not quite of the same caliber. It introduces preschoolers to computers while building basic skills.

Colorful graphics and realistic Sound Blaster sound effects elicit squeals of laughter. Kids enjoy manipulating the mouse as they explore software activities.

So encourage your children to visit the little red schoolhouse with Barney. It's a great way to get them ready for their own first days at school.

CAROL S. HOLZBERG

IBM PC and compatibles, 512K RAM, EGA or VGA, Sound Blaster, mouse—\$39.95

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Circle Reader Service Number 366

106 COMPUTE MAY 1992

U.S. ROBOTICS SPORTSTER V.32/PC

This Cadillac of modems makes my four hours online each day just cruise by. What's so special about this internal modem? For one thing, 9600 bauds. For another



Listing at \$549, the U.S. Robotics Sportster V.32/PC isn't cheap, but it's a full-sized, full-featured modem.

er thing, as close to glitch-free communications as I've ever experienced. It's a well-engineered piece of hardware that will give you many years of fine-tuned service.

The last dozen modems I've installed here at COMPUTE have been compact models. It's almost like the manufacturers are trying to get better mileage by leaving out parts and making the cards smaller. These modems don't reject line noise very well. But this U.S. Robotics modem is a full-size card that's jam-packed with stuff. It combines all of those parts for great line-noise rejection. They don't add to the probability that the modem will break down; in this age of solid-state circuitry, that's unlikely.

And there's more to the card than line-noise rejection. MNP error-control proto-

cols and MNP5 compression are implemented. These are techniques that help modems communicate more accurately, and, in some cases, with fewer data bits sent for the same amount of information. Not all services support MNP features. When I connect to America Online, I have to make sure these features are disabled or I have

transmission, then it's an even better choice. This modem won't be obsolete next year or even the year after. It's on the forefront of consumer electronics and will serve you well for years to come.

Since I spend many hours online, this modem is a good investment for me. Rather than send back the one loaned for this review, I'm planning to buy it when the U.S. Robotics rep calls to ask for its return.

RICHARD C. LEINECKER

U.S. Robotics Sportster V.32/PC—\$549

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Skokie, IL 60076
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(708) 982-5010

Circle Reader Service Number 367

TOPTRAK

Are you mousebound? Short on scurrying space? Amazed at the maze of paper and equipment your mouse must negotiate? Kraft's sleek and capable Toptrak offers a sensible solution.

I put it on top of my monitor, on my leg, beside a keyboard—anywhere I can find a little spare room. It plugs into either a 9-pin or a 25-pin serial port, and the long cord gives you plenty of room to place it where you need it.

Kraft's memory-resident Speed Panel program lets you adjust sensitivity (how fast the computer responds to movement) up to 1150 dots per inch. Want to use Toptrak with programs that aren't mouse-driven? Try Kraft's Menukey program.

You'll like the way this trackball feels. It's smaller than other trackballs and contoured with rounded corners and a forward-sloping design to fit the hand more comfortably. If you want, you can pick it

trouble connecting. The manual offers adequate technical assistance with these problems, though casual computer users may have trouble plowing through the jargon.

The card was simple to install. It comes set for the most common configuration found, COM 1 and IRQ 4. That fit my system perfectly, so I didn't have to mess with switches. But if you do have to make changes, the DIP switches are on the back. That means you don't have to take your computer's case off to change settings.

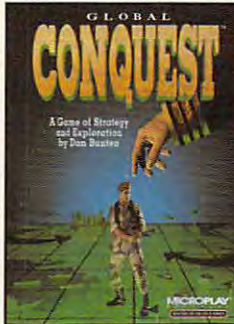
This modem isn't inexpensive. The list price is \$549, but street prices are lower than that. For many people, the price tag is too high. But if 9600 bauds will save you money in connect charges, it starts to make sense. And if you rely on error-free data

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up and operate it with one hand, even more easily if you plug in the optional foot pedal (not the ideal tool for double-clicking). Large left and right buttons above and to the side of the ball give way with relative ease—only slightly harder to press than the buttons on some mice. Pressing the button directly above the ball achieves the same effect as pressing the right and left buttons simultaneously. The fourth button, just above the middle one, comes in handy with programs that involve dragging. You don't have to hold down the left button and operate the ball simultaneously. Just press once to lock the button. Then manipulate the ball and your cursor in the right direction, and press the locked button again to unlock it. Grooves run across it to provide tactile, as well as visual, differentiation from the other buttons.

I found the ball in this trackball a real pleasure to use—smooth and responsive with no skidding or grinding. As far as I can tell, you can't remove the ball for cleaning as you can with other devices, so you'll need to keep this one from getting dirty.

Laptop users, take note. The Toptrak's low-current, compact design makes it a candidate for portable pointing, though it's not as compact as the current crop of notebook-specific pointing devices. If clutter cuts into your productivity and you're tired of mousing around, consider the Toptrak.

MIKE HUDNALL

Toptrak (bundled with foot pedal and TelePaint)—\$99.95

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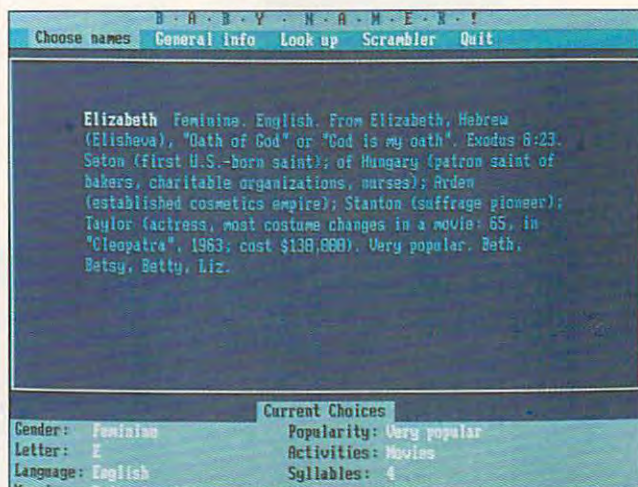
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108 COMPUTE MAY 1992

BABY-NAMER!

One day you'll probably have to bestow a special name on someone or something—possibly your newborn child. Since I'm a confirmed bachelor, though, babies don't much concern

advice that didn't sway me in any particular direction. The manual's tips on searching proved more useful, and the appendices offer the necessary explanations and descriptions of search categories. Clearly targeted at the expectant couple, Baby-



Give your kid a handle with Baby-Namer!, which gives the expectant parent more than 14,000 names from which to choose.

me. Even so, using StudyWare's Baby-Namer!, I did run across a number of choice monikers for my future cats, dogs, and short story characters.

Baby-Namer! puts more than 14,000 names at your fingertips, each complete with definitions, namesakes, and other related data. You'll need to limit your search to fewer than 14,000, of course, and to do that you merely check items off a menu. Want a unisex, unusual name meaning "intellect"? Baby-Namer! supplies several, with *Channing* the most notable. Ever wonder what your own name means? Ask Baby-Namer!. *David* means "beloved," and I found myself in the good company of a saint, a playwright (Mamet), and a pop star (Bowie).

Baby-Namer! offers some abbreviated online naming

Namer! should provide them with all the names a child will ever need.

DAVID SEARS

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SITBACK FOR WINDOWS

With computer viruses, power spikes, and software incompatibility lurking out there, we have every reason to follow the advice of computer professionals: Back up your hard drive frequently. Because of the time it takes, however, few of us do. Sitback and its new relation, Sitback for Windows, help.

You don't have to take time

out of Excel or Word (or Tetris or Solitaire) while saving your precious files. Sitback for Windows initiates backups while you continue with more immediately pressing business. Or it waits until your computer is unattended and then institutes the backup itself.

The first method makes use of Windows' multitasking capabilities and Sitback's own support for backups on a user-chosen day of the week and time of day. You determine Sitback for Windows' buffer size and priority level as a background activity, as well as which files to back up.

The second method—the lazy person's preference in backups—earns Sitback its fame. This backup utility waits a predetermined length of time (anywhere from 1 second to 60,000 seconds—slightly under 17 hours—is acceptable). If the computer remains unused at the end of that period, Sitback goes into action. Since most of us work on just a few files during any given computer session, an incremental backup of the day's effort makes perfect sense. Just slip in a floppy, move on to other business, and Sitback eventually takes care of the rest.

Menu selections are sensibly chosen, and documentation (both online and in the accompanying booklet) is more than adequate. Sitback for Windows' implementation is as carefully thought out as that of DOS-based Sitback. Data security and ease of use make both versions of Sitback well worth considering.

BARRY BRENECAL

IBM PC and compatibles, Windows 3.0 or higher—\$139.95

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WINCONNECT

If you regularly work on both laptop and desktop computers, transferring files between the two, you know what a headache it can be to keep the files in each machine up-to-date. With WinConnect, Traveling Software aims to simplify the process.

WinConnect is a new approach to keeping laptop and desktop files up-to-date without constantly checking file dates and shuttling files back and forth. Other approaches, à la GetC's File Shuttle, use cables to transfer actual copies of files between two computers. File Shuttle's method is convenient in most situations, but deciding which files to shuttle to which computer can be time-consuming, especially if you've made changes to files on both computers.

With WinConnect, you only have one decision to make: Which files have to be ready to travel? Once that decision is made, important files go on the laptop only. Use the 25-foot cable and WinConnect's software to turn the laptop into a file server for the desktop machine. When you need key files, you load them from the laptop server to the desktop client, work on them, and put them to bed on the laptop. Through the magic of WinConnect and the LAST-DRIVE statement, the desktop machine gets fooled into thinking the drives on your laptop are its own extra drives.

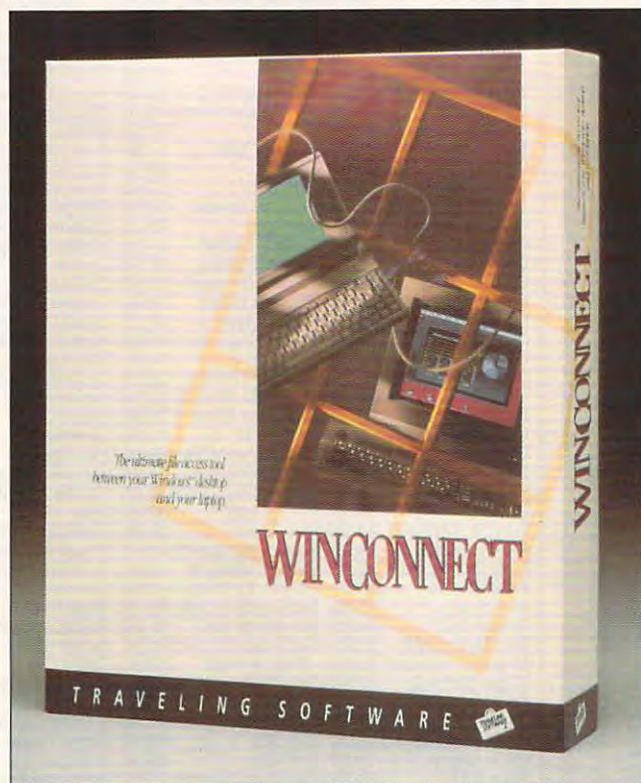
You can use any existing port, COM 1-COM 4 and LPT 1-LPT 3, to link client and server. Data travels over the cable at a default speed of 115,200 bps, but you can only open data files, not run programs that reside on the server. For example, you

would open Microsoft Excel or Lotus 1-2-3 on the desktop client and call a particular spreadsheet from the laptop server. To use the files both on the road and at the office, you need to have Excel or 1-2-3 on both computers. If you want to run programs from the server only,

menu, including a red hDC logo on every control menu on every Windows program you run, no matter who makes it—kind of like having an advertisement inset in every frame of the video you bought . . . and every other video you own. But wait! Before you tear the program off

made actual copies of the server files through File Enhancer, floppies, or a program like File Shuttle. But if you want to forget about updating files when the red phone rings and you have to take the Batplane to Belgium, check it out.

REBECCA ROHAN



Traveling Software's WinConnect simplifies the process of transferring files from desktop to laptop.

you need a remote-control program like Carbon Copy Plus. WinConnect includes hDC File Enhancer, which adds a small menu of housekeeping tools so you can delete, copy, move, replace, and append files, and create and delete directories across the cable.

The actual WinConnect software is written by hDC, the people who make First Apps and Windows Express, and adds the same type of additions to the Windows

disk, hunt up MicroApp Manager, choose Options, and select Tear Off to jettison the ads and keep the program. You must uninstall other hDC applications before installing WinConnect so WinConnect can reconfigure the HDCLIB.DLL file.

WinConnect may be just the ticket for having all the files you need ready to go at all times. If someone grabs your laptop and runs, however, you won't have copies on the desktop unless you've

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Circle Reader Service Number 371

XTREE GOLD 2.5

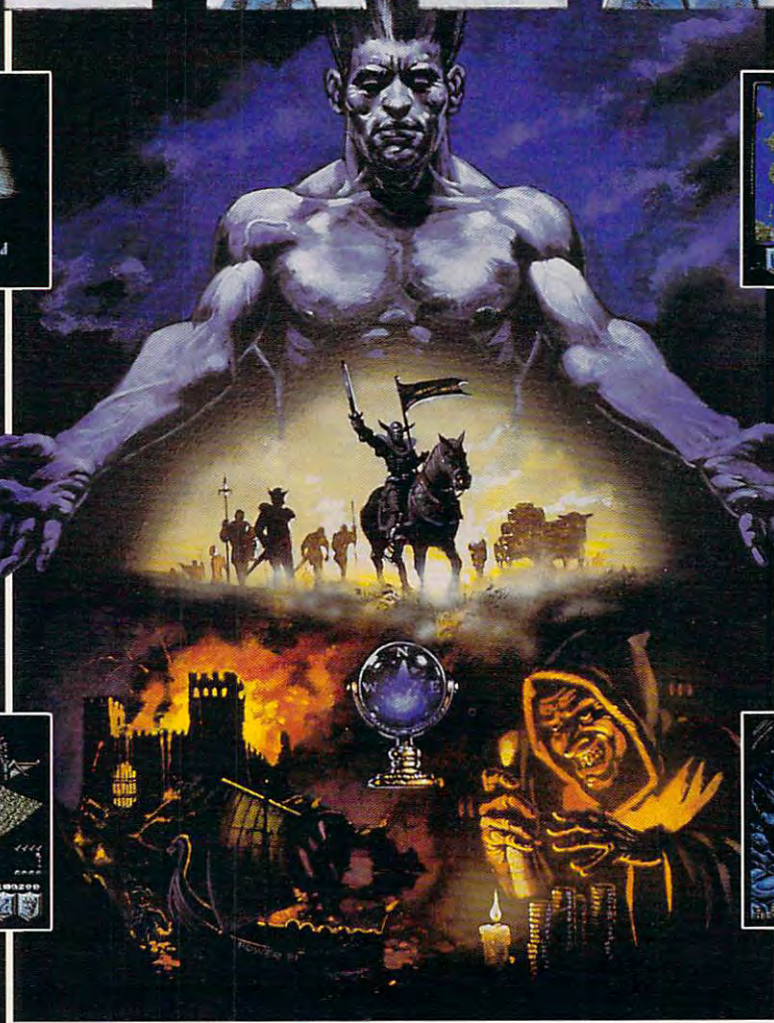
Less than six months after installing a second 30-mega-byte hard disk in my computer, I found that I was running out of space. Time to clean house *again*. I needed serious hard drive help—fast.

XTree Gold 2.5 means serious help for hard disk users. Always a premium hard disk management utility, this version has my head spinning with the scope and magnitude of its features and functions. When it comes to housecleaning, XTree and a mouse can actually make the job seem like fun.

XTree splits the screen into several boxes, giving you information on disk size, volume name, and the files in your currently selected directory. I've always liked XTree's tree-structured display of all the directories and subdirectories on any selected disk. Thankfully, this distinctive feature has survived all updates.

As you move through the graphic display of directories, a list of the files that reside in each highlighted directory appears along the bottom of the screen, just above a display of available

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commands. If you'd like to see more of the file list in a given directory, just click the mouse on the directory tree display or hit the Return key, and the tree-structured display will be replaced with a display of all the filenames in the current directory that will fit in the box.

Commands are given to XTree in a number of ways. In fact, you can enter most XTree commands several ways. With the keyboard always active, you can type a command, use a multitude of hot keys, or simply highlight a command with the arrow keys and hit Return.

XTree also supports a two-button mouse (the middle button on a three-button mouse will remain inactive), and if you choose to run it this way, you'll find the program to be one of the most mouse-intensive packages on the market today.

You can drag a highlight down directory listings to select individual files, tag files for action by clicking, or give virtually any program command by clicking directly on the display of available commands.

A series of pull-down menus across the top of the screen gives you full command of all the program's powers and capabilities. Again, you can access these pull-down command menus from the keyboard or with the mouse.

Of course, the number of files residing on most hard disks can overwhelm you when they're all displayed on-screen. That's why XTree makes it easy to sort any displayed list of files by name, extension, date, or size. Within any of those sort categories, you can also choose to reverse the order (from smaller to larger, oldest to newest, and so forth). You can even

choose to display files sequentially, in the order in which they appear in your particular directory path.

I was particularly impressed with the program's Unsort option, which lets you put a file list into the same order you'd see with DOS's DIR command. This might seem insignificant, but most similar disk utilities won't do this, and there are times when you might need your files sorted in this manner. One of those times might be when you use XTree's Print Directory function to generate a hardcopy list of current files.

XTree allows you to split the screen into two displays. This capability is almost a necessity if you want to move files from one subdirectory to the other or search for those pesky duplicate files that grow on your hard disk like mildew in the basement.

When it comes to tracking down duplicate files, XTree doesn't just split the screen into two directory displays and leave you to look for them yourself. The program's Compare function will automatically locate all files with the same names or dates. You can also search for all unique files—files without duplicates—or have it find files of the same name with the newest date or oldest date.

The Compare Directory command will search specified directories on your disk and locate matching files with the same criteria selections that are available in the Compare File command. You can also tell XTree to search selected directories or entire disks for files containing specified text strings. This makes it easier to find, for example, all letters addressed to one company in your Mail subdirectory, even

though that company's name might never appear in the filenames themselves.

But the point of locating all these duplicate and unnecessary files is to find the ones you need to delete or move and clean up all that clutter. With XTree, you can just tag files as you go and then tell the program to take a specified action on the files you've tagged. This can be done file by file, or you can tell the program to tag all files that fit certain criteria. XTree will even tag every file on your hard disk.

Once they're tagged, it's easy to move files to another disk or directory, delete them, or even archive them. You archive with PKZIP and you can compress entire directories or even an entire disk to save space. When you restore the files from an XTree archive, just type the name of the archived file and it self-extracts, re-creating the file structure.

But wait! Before you delete that file or entire directory, you might want to take a peek inside and make sure it's a file you no longer need on your hard drive. In addition to the prodigious number of spreadsheet, database, and word processor formats that you can view with XTree, you can now display graphics files. The formats supported include BMP, DWG, GIF, IFF, LBM, IMG, MacPaint, MSP, PCX, PIC, TIFF, and WPG!

Something in a file that you'd like to change? Load 1Word, XTree's built-in word processor, and make any changes you need. While 1Word doesn't support a mouse, I don't think you'll be too disappointed. 1Word is surprisingly feature-laden for a built-in program.

XTree also includes a program launcher that allows

you to run your favorite programs with the click of a mouse button. Choosing files associated with applications, like DOC files for word processors, will load the application first, then the associated file—a handy option.

XTree Gold 2.5 does so much that all of its features and functions can't possibly be discussed here. Just remember that the program is a large one. You'll need a bit of hard disk space to get it all installed, but installation is so easy and the program is now so complete that I heartily recommend you sacrifice the disk space to harness this workhorse for the betterment of your computer system.

ALAN R. BECHTOLD

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REMOTE RX

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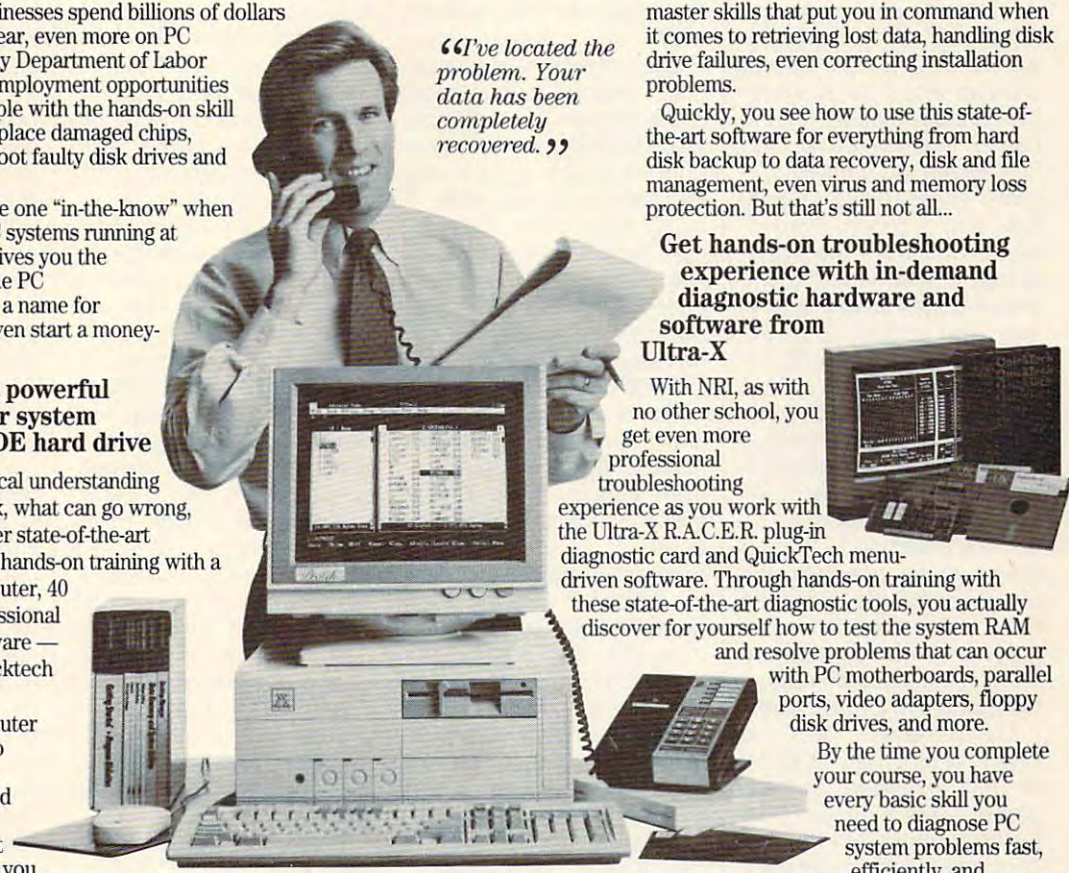
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about any PC you encounter. This PC physician even practices on Novell networks. Remote Rx comes with two sets of disks, one for the controller (local site) and one for the remote site. Merrill & Bryan thoughtfully provided these disks in both 3½- and 5¼-inch low-density format. While the manual explains all its terms and even includes them in a glossary, you should be a reasonably experienced PC user with knowledge of most DOS commands and subdirectories, and a rudimentary knowledge of communications, especially if you plan to service someone else's PC. There isn't an install program; you're directed simply to copy the files into their own directory. The files on the distribution disks are listed in an appendix, along with explanations.

Using Remote Rx, you can test all types of RAM: normal, extended, and expanded. My favorite RAM-test feature displays the bad chip graphically, by its position on the circuit board. You can view and edit the information in your computer's CMOS RAM: system time and date, disk drive types, and so on. The program identifies device drivers, interrupts, the contents of the DOS environment table, and parallel and serial ports. You can test every mode for every common video board, the keyboard, and serial and parallel ports. The last two require simple cap devices not included with the product. Also, you can test the game port, paddles, joysticks, mice, and disk drives. PS/2 users will appreciate PS/2-specific features such as a report of all POS devices installed, by name and ID.

Remote Rx prints snazzy

reports on everything it tests and can test in batch mode while you're away. The user interface is immaculate. Snappy menus sport a well-chosen, customizable color scheme, and the program operates equally well with mouse or keyboard. A handy User menu at the far right of the screen lets you install programs with inspired ease. Any function that doesn't execute instantly can be interrupted, and the help screens offer a print option.

Remote Rx would be a design and documentation tour de force in any software category, but it possesses elegance almost unheard of in a diagnostics program. If you've become the office or neighborhood guru, Remote Rx won't stop midnight calls from distressed PC owners, but it will help you handle them without leaving your home office. My diagnosis: Get Remote Rx, do your good deed, and get back to bed.

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Besides the essential Bible text, THE WORD Processor line provides several very welcome study aids as add-ons. If you'd like to follow a theme in a particular verse throughout the Bible, use the Chain Reference program to supply a list of related verses and display the texts on command, or access Librarian for lists of verses dealing with particular Biblical people or topics, or create your own specialized lists. The Personal Commentary add-on replaces cramped marginal notation with plenty of room to write (and, if you like, print out) your own commentary on individual verses.

The Chronological Bible supplement provides a historical outline of events in Scripture and allows you to call up relevant Biblical texts. Once you've finished your re-

search, you can go into the Lesson Editor feature of Librarian to write your exegesis, importing Bible verses as you need them, or you can use your own word-processing software in conjunction with the memory-resident Verse Typist, which lets you import verses from anywhere in the Bible into your own text.

But the real stars in THE WORD Processor's crown may be Greek Transliterator and Hebrew Transliterator, each based on Strong's Exhaustive Concordance. If you don't know the Biblical languages, the transliterators provide the Greek and Hebrew originals and definitions for Biblical words in any verse you choose—or you can trace them by the standard Strong's reference numbers appended to them. Through either transliterator, you can find (for example) that hell is not quite the same place in the New Testament as in the Old, that love may mean anything from simple affection to sacrificial selflessness, and that a son might be either a direct or a remote descendant, depending on the context. The Strong's numbers also show how words relate to or derive from one another, providing more flexibility than a simple interlinear translation.

The ease of Biblical access and the consolidation of research sources make THE WORD Processor's Bible and study aids very valuable tools for pastors and Bible students. Despite its wealth of features, its commands are easy to learn and are backed up by clearly written documentation and a tutorial disk that walks you through its functions. What the printing press began with the increase in Bibli-

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CALIFORNIA GAMES II

Surf, sand, and sun—they're back in California Games II, a sequel to the original game that matched you up with some of the best dudes and dudettes in the Valley. This time around, you and up to seven other players can play new games with better graphics.

During the hang-gliding competition, you soar over seaside cliffs, performing stunts and throwing water balloons at the targets below. Just like the real thing, it's a lot harder than it looks. Ideally, you'd catch thermals to stay airborne, but it's difficult to read the wind currents when you're on the other side of the computer screen.

You have more control when you're snowboarding. If you survive the cliffs, tree stumps, and rocks, you'll face the Snowbowl and the grassy Obstacle Course. You'll find even more fun things there—like ice patches—to trip you up.

Jet surfing is less backbreaking. You can go through the ramps and course markers like a ghost and not wipe out. Nevertheless, you must stay on the course to earn points. The ramps on the Ramp-O-Mania course give you some excitement and extra points. Because you can spend most of your time finding your way back to the course, however, an overhead view of it during your run would be helpful.

You do have such a view to guide you as you skateboard through the California Aqueduct. That way, you're less likely to smash your face into the wall. If you do, it's a repulsive sight, but it's actually the biggest thrill of the skateboarding competition. After the first tunnel, you skateboard a little too slowly, and the fun of the stunts wears thin.

You could say the same for the bodyboarding competition when the wave breaks. You can easily memorize the obstacle course back to the beach, since it doesn't change. While you're riding the wave, though, you can perform

stunts to some groovin' surf music.

The biggest disappointment of California Games II is that there are no big rewards when you finally finish a competition—no trophies, no hunky dudes or fabulous babes kissing you. You just get to live, and you won't have "fault dude" behind your name on the scoreboard. But with its VGA graphics, colorful lingo, and lively music, California Games II can at least let you pretend you're in California.

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SPEAK OUT

Ever since I learned that Congress could approve its own pay raises, I've been waiting for software that would make writing politically charged missives practical. Speak Out sent me on a letter-writing spree and filled my correspondence with appropriate names and addresses. Directing disapproval or kudos to almost anyone on the government dole has never been simpler.

"Apathy is democracy's biggest enemy," declares Speak Out Software's president Ken Rosmarin. "A nation of sheep eventually begets a government of wolves—which means politicians make bad decisions when good people don't speak out." With its ample database, Speak Out encourages you to strike a blow for democracy by putting often tedious-to-track-down information instantly in your hands. You'll find the names and addresses of all elected federal officials, the government officials of one selected state (you select which one during installation), federal agencies, the Supreme Court members, the mayors of the 100 largest cities, and the CEOs of the Fortune 200 companies. You can make use of listings for the leaders of foreign countries, the United Nations, international organizations, foreign embassies in the U.S., and U.S. embassies in foreign countries.

Worth its purchase price in database assets alone, Speak Out throws a rudimentary but functional word processor in as well. You can easily master the database's uncomplicated interface, even in the heat of anger over planetary deforestation. A search feature, however, is noticeably absent. Scrolling through long lists using Page Down consumes too much time for my taste. However, the manufacturer assures me that a complete keyword search function, as

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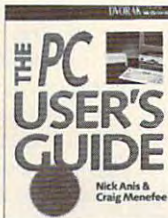
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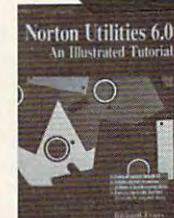
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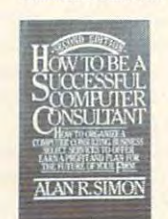
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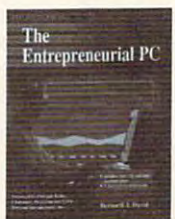
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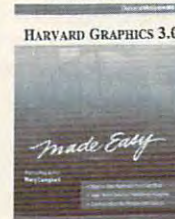
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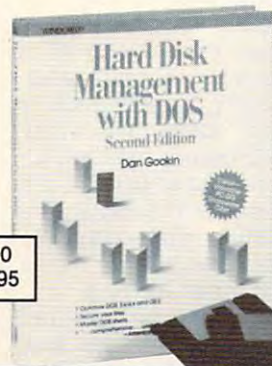
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PC-KWIK POWER DISK

One of the most common problems PC users face is file fragmentation, a DOS condition that forces the drive to work harder than it has to. Multisoft's PC-Kwik Power Disk, a full-featured disk optimizer, provides both immediate relief and long-term preventive maintenance.

Power Disk works its magic by rejoining splintered files and packing them into a single contiguous area of the disk. The program offers numerous reorganization strategies, including full or partial defragmentation, DOS-ordered subdirectories, and user-defined file placement. In addition, the program performs complete file-structure analysis, media testing, and reporting.

Multisoft claims improved performance on any size fixed or removable storage media: MFM (standard XT or AT), RLL, IDE, ESDI, and SCSI hard drives; floppy disks (360K to 1.4MB); cartridges; read/write optical drives; and even RAM disks. Its restrictions—no more than 32,768 files per disk or 32 directory levels—are well within the limits of most users.

The program's best feature is its highly configurable batch mode operation, automatically optimizing either on a conditional basis (depending on the percentage of fragmentation) or on a regular schedule. This technique benefits high-usage systems, where extensive copying, moving, and deleting of files can result in daily fragmentation.

In terms of speed, compatibility, and sheer user-friendliness, Power Disk tops almost all competitors. Unfortunately, the program's lofty list price will probably discourage many potential buyers, especially when the massive PC Tools and Norton Utilities are within easy grasp. Proportionally priced, these packages offer competent disk optimizers, plus a whole lot more.

Power Disk is the right tool—but at the wrong price. Sometimes being the best just isn't good enough.

SCOTT MAY

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Circle Reader Service Number 377

STREETS ON A DISK

Can't get there from here? Maybe you need Streets on a Disk, an update of a sophisticated mapping program that's been around and evolving for several years.

The system consists of a base package, which contains the mapping software itself, and sets of accessory files—the maps. In my case, I received a map of Guilford County, North Carolina.

You can use Streets to locate streets or addresses, plan travel routes, and estimate travel costs. Want to know where Galway Drive is? Type in the name, and the street is highlighted. Want to get from here to there? The program includes a route calculation feature that scans all available pathways and picks the one its data says is most efficient.

The street maps, which include everything from interstate highways to footpaths, are used in conjunction with place maps, which you build to suit your needs. Using the map editor, you can add points of interest such as hotels, restaurants, or clients to your map. The place maps work as overlays to the street maps, so you can create several separate place maps to work with a single underlying street system.

Adding places is a simple process of pointing to the place's location on the map and then identifying it. Alter-

natively, if you have hundreds of locations to plot, Streets includes a feature called Autoplace, which reads a text file containing place information and locates those places on the map.

One of the program's more interesting features, Autoroute, finds the best route between any two points you specify. Depending on the distance, the number of streets involved, and the speed of your computer, this process can take several minutes—or hours—to complete.

I tested Autoroute with several of my regular destinations here in Greensboro, North Carolina, and found that, while it usually got me from here to there, it didn't always choose the routes I've found to be the most efficient. Streets on a Disk can figure mileage and calculate travel time (each street has a speed value associated with it), but the program doesn't have access to the intangibles, such as the stoplight that always seems to be red or the intersection where traffic's always backed up.

After calculating a route, the program can print out both a map and a set of detailed travel instructions.

The program's map files are constructed from government data and are quite accurate with a few exceptions: One-way streets are not identified, roads that have been recently built or recently relocated are not shown, and the program may incorrectly interpret some highway overpasses as intersections.

According to Klynas Engineering, the program's creator, these problems are to be expected, but all of them can be corrected with the help of the street editor.

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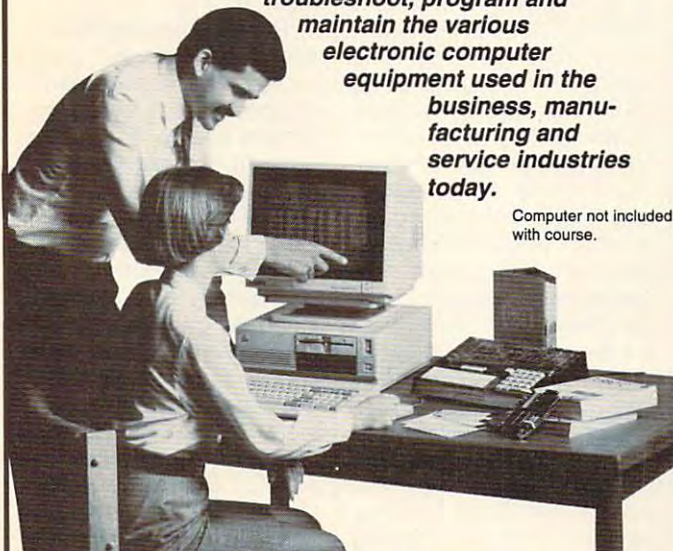
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In fact, the maps are working documents that users are expected to edit.

Streets on a Disk is not the easiest-to-use program in the world. Although it permits the use of the keyboard and/or mouse, the interface is nonstandard and difficult to use. For example, to make a menu bar selection, you click the right mouse button until the option you want is highlighted and then click the left button to select it. The documentation, while providing generally adequate information about using the program's features, is antiquated in appearance.

Despite the unusual interface, Streets on a Disk is an extremely powerful mapping tool that includes many more features and utilities than have been mentioned here. If you have heavy-duty mapping requirements, you should give this program a good look, keeping in mind that you'll need a fast system and a large amount of hard disk space to run it.

TONY ROBERTS

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ENGLAN

Gentry Software has tried to eliminate one of the bugaboos of learning to program with its latest version of EngLan.

Because you select program commands from a menu, you can't make syntax errors. It's impossible to forget a semicolon or misspell a variable name. These nitpicking rules of pro-

gramming languages have scared many new challengers away from programming, so Gentry Software should be commended for chasing off this particular programming demon.

By solving one problem, however, EngLan has created others. The interface stumbles and falters throughout the program. For example, to make a simple revision in your program, you must exit the program-writing mode and return through the program-viewing mode. And EngLan offers no default choices. A familiar feature of most software, defaults let you press the Enter key to indicate the most likely response. Many little twists and turns in the program, which aren't limited to the examples cited above, make the interface problems even more significant.

Interface problems affect the ease of use of a program; the manual and tutorial affect the ease of learning. EngLan has multiplied its problems with its poorly designed documentation. Parts of it are good enough for any beginner. Other parts, however, simply obscure the concepts they're meant to teach. The tutorial, for instance, includes a lesson on how to clear a screen but fails to provide anything on the screen to clear. Many sections of the tutorial ignore the implications of each command, failing to play one command off the next. Although you can easily understand what each one does, you can't really see how they work together to create a useful program.

Gentry Software's purpose was to create an easy-to-learn, easy-to-use programming language, only EngLan doesn't have the ergonomic, educational kick

to meet this challenge. If you want to learn to program, either find a good class or wait for Gentry Software to rework EngLan. With one more update, directed at the interface and the tutorial, EngLan could be a fine educational experience.

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ECO-ISLAND

Jeez—what a mess! You're minding your own business there on trash-filled Eco-Island when suddenly M-Kar, a friendly space alien, crashes his spaceship and seeks your help. But his craft isn't the only thing littering the landscape. Eco-Island itself is knee-deep in gunk and garbage.

The only way to rebuild M-Kar's ship is to collect all the trash on the island and recycle it into the form of a spaceship. To power the spacecraft, you must conserve electricity. You must also save enough water to take along on the trip. All of these tasks comprise First Byte's Eco-Island, a new game featuring Zug the Megasaurus, whom you might remember from the popular Dinosaur Discovery Kit. This new game quickly draws you into the challenge of cleaning up the island and getting M-Kar home before his parents start to worry about him.

Eco-Island is a big place—with lots of trash! The game comes with a map to help you get from Zug's EcoCenter (location of the recycling machine) to all the best plac-

es to pick up trash. There are four trash bins to fill, plus water and power gauges. When a bin is full, you go back to the recycling center and send it through the recycling machine, which makes useless garbage into vital parts for M-Kar's new spaceship. As you pick up trash (using a simple point-and-click method), interesting facts about trash are relayed on the screen.

Two gauges measure water and power conservation. When you turn off an unnecessary fountain, you gain lots of water. Turning off a billboard light saves lots of electricity. Both are necessary for M-Kar to get his ship working and supplied for his trip home.

You meet several different characters during your search for trash. They speak through the internal speaker or a sound booster, such as the Covox Speech Thing. Some of them have hidden surprises, including large amounts of valuable recyclables, which delighted my son. Some characters say mean things, but that only makes collecting the trash more exciting.

There are several "live" areas on each screen, giving clues about where trash is stashed. It's always worthwhile to attempt to talk to inanimate objects: trees and rocks—even statues!

This innovative game is fun, and it really teaches recycling. My four-year-old was quickly able to understand the game and manipulate the controls well enough to both collect trash and conserve water and electricity. The two of us learned how to categorize trash into plastic, aluminum, paper, and organic waste. Now, we can't go anywhere without my son's pointing out all the

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trash and wanting to pick it up and put it away.

The age range for this game is from four to nine years. I have a feeling that older players, accustomed to fast-paced arcade games, will find the slow pace of picking up garbage extremely frustrating. I did. I wish the makers had developed a method of highlighting all the plastics to dump at once, rather than forcing me to pick up each cup, one at a time. The more I played, the more aggravated I got. Luckily, you can save your game, so if you've gotten almost all the trash and have to stop playing you don't have to start from scratch.

My second complaint is that I couldn't win! I don't know if I just wasn't clever enough or if there was some kind of glitch in my software, but I simply couldn't find the last character. I never learned how the game ends or what M-Kar's spaceship looks like. However, the average seven-year-old, who is more computer literate than middle-aged old me, might have better luck.

BETH ANN MURRAY

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The DOS-based P&L attempts to bring all the power of modular accounting packages to a checkbook-based, single-entry system. Many small businesses don't require a balance sheet and reconciliation of owner's equity, but they do require the profit-and-loss and cash-flow statements P&L provides.

P&L leaves out confusing accounting concepts such as accrual accounting, double entry, assets, liabilities, and owner's equity for simplification. Potential buyers, however, should be warned that this program may not be suitable for corporations and partnerships from whom the IRS requires a balance sheet.

P&L goes beyond programs like Quicken to provide many of the mod-

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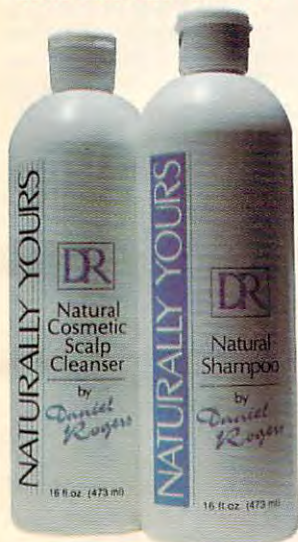
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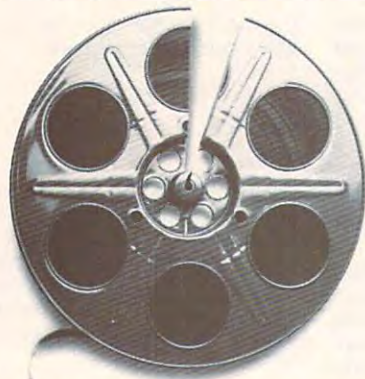
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ules found in very-high-priced, double-entry accounting systems: order entry, purchasing, inventory, payroll, point of sale, vendor list, pricing, and so forth. And it has an impressive list of easy-to-use features, graphs, and reports that make it more than basic accounting.

Perhaps one of the best features is



Profit and Loss sacrifices accounting sophistication for ease of use.

P&L's script-based report generator, which can produce any type of custom report. A compiler reduces the report to a faster, more compact form of a script. Realizing that the 320-page report generator manual could be more confusing than double-entry accounting, the authors provide more than 300 ready-made report overlays and will design simple custom reports for \$18 each.

Like Quicken, P&L has a bill-paying module. Auto Pay identifies which bills are due, makes a list of checks, and applies them to the items currently due. It also makes sure you don't pay bills before they're due, and it helps you take advantage of vendor discounts based upon time payment. This software doesn't have an electronic bill-paying option, however, nor does it integrate with the CheckFree electronic bill-paying system.

Computerized timecards let employees punched in from anywhere in the system. The timecards will increase in usefulness once Sensible Software makes this program network compatible.

The payroll module can handle overtime, special shifts, holiday pay, and an infinite amount of withholding options, but it won't automatically compute withholding taxes or generate the IRS and state payroll forms that employers must submit to the government. You need to look up the numbers in the appropriate table or calculate the correct amounts manually before entering the tax into the system.

P&L can run two credit checks while in order-entry mode to see if customers are overdue paying their accounts and to see if they've exceeded their credit limits. You can then increase their credit, hold the order, and/or view their prior transactions. Orders can be aged and discounted based on a system of variables.

Order entry uses nine modules to generate orders, invoices, and charges. You can bill with interest through invoices and monthly statements. You can set 49 prices for each product based upon six quantity breaks, seven price levels, and a discount of normal pricing.

The inventory module computes inventory using three of the four accepted methods: FIFO, LIFO, and average cost. Shopping allows you to set order quantities and will automatically generate a purchase order when products need restocking. You can then customize the purchase orders before sending them.

P&L's audit trail system maintains a narrative record of transactions for reference when you want to sort out any confusion you may have in viewing transactions lists. Activate the help system with the F1 key and you'll access an impressive list of features, including 1.6MB of online text, index, and a glossary. You can access help from any point in the program or use the help indexed to your specific location.

The new retail-sales module allows for over-the-counter and point-of-sale transactions in a cash register or storefront environment. It uses a universal customer record that allows easy review of register sales. The module generates a single invoice for each business day.

You can build deposits from a variety of items to allow for online reconciliation of the day's income to daily bank deposits. This provides a traditional audit trail for income and allows for the easy identification of daily cash receipts and payments made by credit customers against their open orders and accounts.

P&L comes in compressed form on six 360K 5¼-inch disks, with exchanges available for 3½-inch. You need 5MB to 20MB of hard disk space, depending on the size of your business.

Not for those well versed in the double-entry system of accounting or for those who require features like depreciation, accrual-basis accounting, balance sheet, and statement of owner's equity, P&L does cater to a specific audience. Those who have neither the time nor the inclination to learn traditional accounting and who want to leave accounting to accountants but still need an easy-to-use, checkbook-based accounting system to keep track of their businesses will find P&L to their liking.

ALFRED C. GIOVETTI

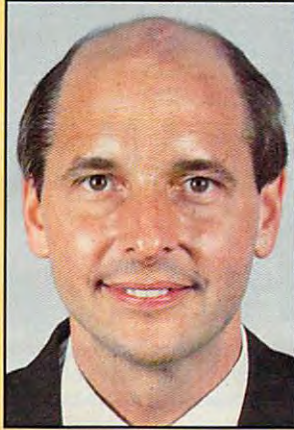
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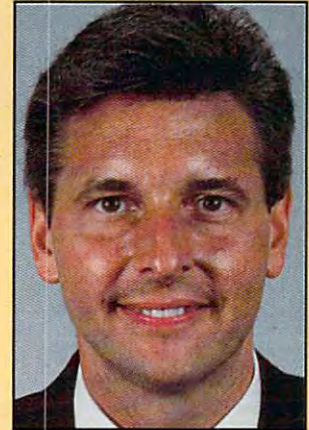


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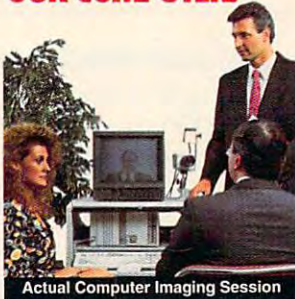
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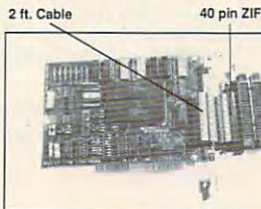
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Jill Champion

Hot new products from Tandy, Momenta, and Fujitsu; getting the numbers on MicroLeague Sports; getting a Mario education; and more

Speed Demon

Tandy has just announced a new 25-MHz 486SX personal computer upgradable to 50 MHz, with a price tag below \$3,000. Key features of the model 4825 SX are a 25-MHz 80486SX microprocessor (an optional 80487SX coprocessor is available) and support for future double-performance Intel microprocessors, allowing you to upgrade to 50 MHz; 4MB of RAM, expandable to 32MB on the main logic board; three 16-bit ISA slots and one 5¼-inch device slot; two serial ports, one parallel port, and one mouse port; one 3½-inch 1.44MB floppy drive and support for a 2.88MB floppy drive; a built-in 120MB SmartDrive hard drive; 16-bit Super VGA graphics upgradable to 1024 x 768 in 256 colors; preinstalled MS-DOS 5.0, Windows 3.0, Microsoft Works for Windows, and a software sampler; 101-key enhanced keyboard; two-button PS/2-style mouse; and a one-year warranty. The price for the standard configuration with a hard drive is \$1,999; the multimedia PC version costs \$2,799. For further information, contact Tandy, 400 Tandy Center Atrium, Fort Worth, Texas 76102; (817) 390-3861.

No Longer So Remote

Now that its civil suit with Microcom has been settled, Ocean Isle Software has begun shipping version 2.1 of its ReachOut remote-control software for Windows. The upgraded version takes less than two seconds to show a Windows pull-down menu, using a 2400-baud modem. Other upgrade features include support for Super VGA and EGA, Windows 3.1, and all nonstandard DOS text modes, as well as overall speed and error-reporting improvements. Suggested retail prices are as

follows: Modem version, \$179; Host Only version, \$129; Viewer Only version, \$99; Network version (base price), \$295. If you have further questions, contact Ocean Isle Software, 80 Royal Palm Boulevard, Suite 202, Vero Beach, Florida 32960; (407) 770-4777.

The Momenta Has Arrived

The long-awaited Momenta 20-MHz 386SX pen-based computer is now available to consumers. A key feature of the 6.3-pound notebook-sized computer is its Command Compass, a patented feature that allows users to flip through and modify information at the stroke of a pen. The entire package includes a number of tools and applications developed specifically for the Momenta: a presentation package, a note taker that uses electronic "ink," an electronic calendar and address file, a handwriting-recognition trainer, and more. Suggested retail price for the Momenta is \$4,995. If you would like to know more about the Momenta, contact Momenta, 295 North Bernardo Avenue, Mountain View, California 94043; (415) 969-3876.

Make an Impression

Fujitsu recently cut the price of its DL3600 Small Business PrintPartner to \$799, hoping to better compete with other printers in the midrange category. Popular for its versatility among home and small-business users, the 24-wire dot-matrix DL3600 features color-chart and rapid-forms printing, a draft-mode speed of 360 cps, and typewriter emulation for filling in single forms. The printer has a two-year warranty and is packaged with coupons for free font cards and free ribbons. If you'd like to find out more about the DL3600 Small Business PrintPartner, contact Fujitsu

America, 3055 Orchard Drive, San Jose, California 95134-1318; (408) 432-1300.

Luigication

Nintendo has signed a licensing agreement with Software Toolworks to develop "edutainment" software featuring Nintendo's famous Mario Brothers characters for PCs and Nintendo systems. The first title of the series, Mario Is Missing, centers around Luigi's danger-filled search for his brother Mario and will be available this fall. Pricing for the software hasn't yet been established. For further information, contact Software Toolworks, 60 Leveroni Court, Novato, California 94949; (415) 883-3000.

Reach Out and TDD Someone

Microsoft has a new technical support line for its hearing impaired customers: (206) 635-4948. Through the TDD (Telecommunications Device for the Deaf) service, customers can call Microsoft and relay their questions to a support person, and the call will be returned via a TDD modem within four business hours. Phone call charges for using the TDD line are the same as regular long-distance phone charges. For further information, contact Microsoft, One Microsoft Way, Redmond, Washington 98052-6399; (206) 882-8080.

Stats Entertainment

MicroLeague Sports signed an exclusive marketing agreement with USA TODAY Sports Center. MicroLeague game players can download realtime statistics directly from USA TODAY Sports Center without additional software. If you want to know more about the new stats service, contact MicroLeague Sports, 2201 Drummond Plaza, Newark, Delaware 19711-5711; (302) 368-9990. □

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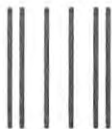
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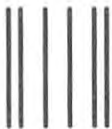
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