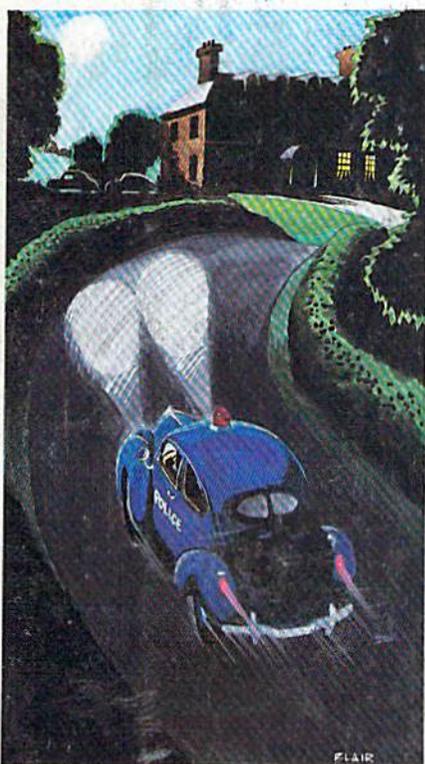


COMPUTER'S GAZETTE™

\$2.95
September 1984 ©
Issue 15 Vol. 2, No. 9
02220 £1.95 UK \$3.75 Canada

For Owners And Users Of **Commodore VIC-20™** And **64™** Personal Computers



80 Columns For The 64

Screen 80: Convert your 64 into an 80-column machine.

Custom 80: Customize your own 80-column character set.

SpeedScript Customizer

Tailor your SpeedScript screen and printer output with this short, easy-to-use program for the VIC and 64.

Also In This Issue:

Computing For Families

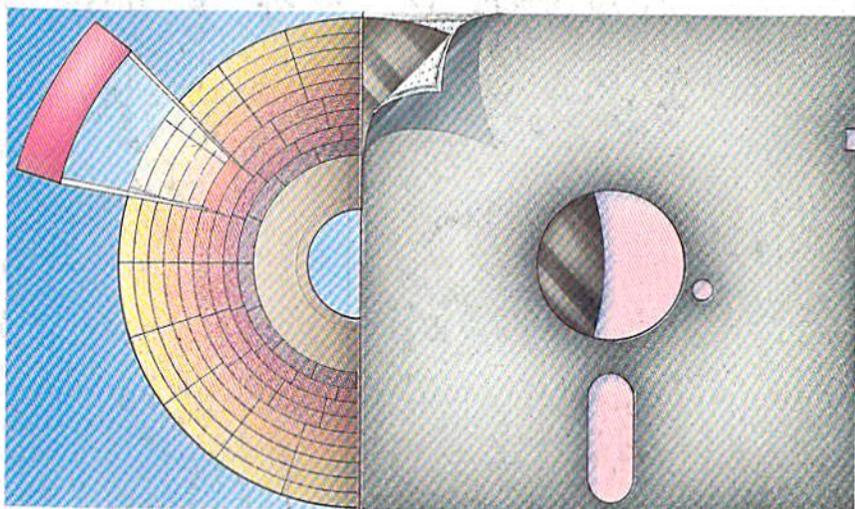
Learning To Count For VIC And 64

Home Telecommunications: The Electronic Cafe

Animating The VIC

Mystery At Marple Manor

Was it the cook? The duchess? Was it done with a knife? Or was it poison? A whodunit text adventure for one to six sleuths.



Disk Tricks

An inside look at disk tracks and sectors including four effective "how to" programs.





DELTA DRAWING.™ Have fun creating pictures and computer programs. Ages 4-Adult.

Kids love to draw. And DELTA DRAWING Learning Program lets them enjoy creative drawing and coloring while they learn computer programming concepts. As they use simple commands to put lines and colors in



their drawings, they're actually writing computer programs!

With DELTA DRAWING, even kids who have never used a computer before can learn to do simple programming and build an understanding of procedural thinking. It's easy, clear, and lots of fun!

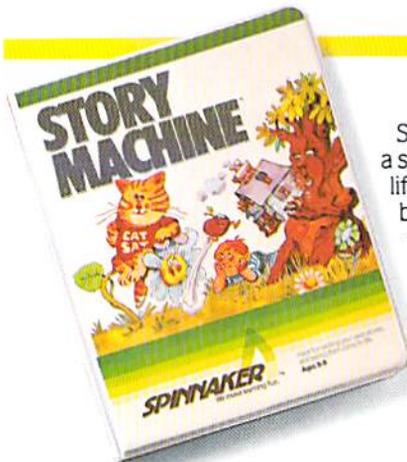
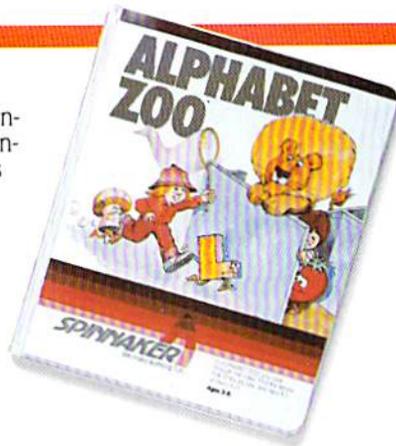
A trip through ALPHABET ZOO!™ Ages 3-8

It's a race. It's a chase. It's Alphabet Zoo, the exciting game that will have your kids zipping through the maze, after letters that fit the picture on the screen.



kids will be learning the relationship of letters and sounds, and sharpening their spelling skills. So they'll be laughing and learning at every turn.

And at the same time, your



The story of STORY MACHINE.™ Ages 5 to 9.

STORY MACHINE is like a storybook come to life. Using the keyboard, your children write their own fun little stories. The computer then takes what they've written and animates their story on the screen, com-



plete with full color graphics and sound.

STORY MACHINE helps your children learn to write correctly, become familiar with the keyboard, and lets them have fun exercising their creativity at the same time.



Disks for: Apple, Atari, IBM, Commodore 64.
Cartridges for: Atari, Commodore 64, IBM PCjr, ColecoVision.

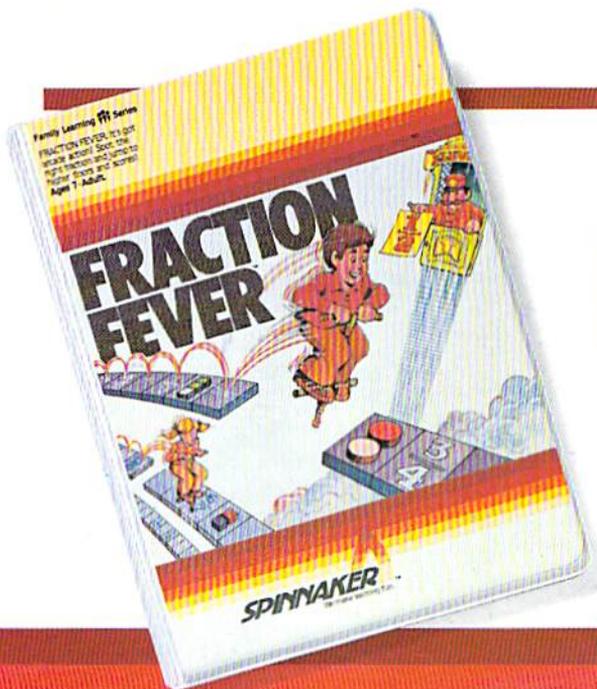
SPINNAKER'S LINE OF EARLY LEARNING GAMES IS GROWING AS FAST AS YOUR CHILD'S MIND.

Watching your kids grow up is a lot of fun. But making sure their minds grow as fast as their bodies is even more rewarding. That's where we can help. With a growing line of Early Learning Programs that are not only lots of fun to play, but also educational.

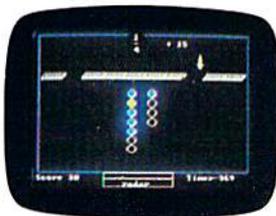
Some of the games you see on these two pages help exercise your child's creativity. Others help improve vocabulary and spelling skills. While others

improve your child's writing and reading abilities. And all of them help your child understand how to use the computer.

So if you're looking for computer programs that do more than just "babysit" for your kids, read on. You'll find that our Early Learning Programs are not only compatible with Apple,[®] Atari,[®] IBM[®] PC and PCjr, ColecoVision and Commodore 64[™] computers, but also with kids who like to have fun.

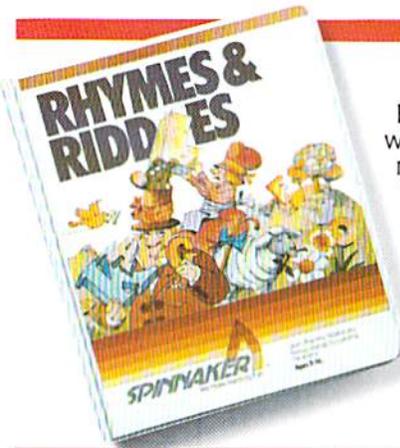


FRACTION FEVER™ brings fractions into play. Ages 7 to Adult.



FRACTION FEVER is a fast-paced arcade game that challenges a child's understanding of fractions. As kids race across the screen in search of the assigned fraction, they're actually developing a basic understanding of what a fraction is and of relationships between fractions. They're even discovering that the same fraction may be written in a number of different ways.

All in all, FRACTION FEVER encourages kids to learn as much as they can about fractions - just for the fun of it!



RHYMES & RIDDLES™ come to life. Ages 5 to 9.

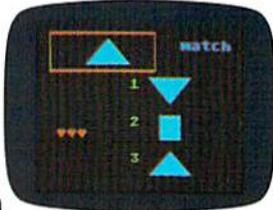
RHYMES & RIDDLES will delight your children. Because when they successfully complete the rhymes, riddles, and famous sayings on the screen, they'll see



and colorful pictures. And RHYMES & RIDDLES not only teaches children the correct lyrics to nursery rhymes and famous sayings. It also helps kids learn to read and spell while they're having fun! That's why parents like RHYMES & RIDDLES, too!

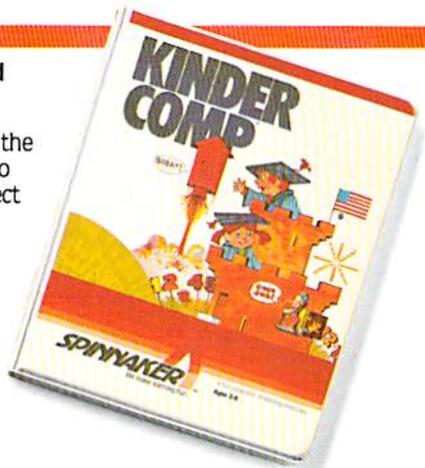
KINDERCOMP™ Numbers, shapes, letters, words and drawings make fun. Ages 3 to 8.

KINDERCOMP is a game that allows very young children to start learning on the computer. It's a collection of learning exercises that ask your children to match shapes and letters, write their names, draw pictures, or fill in missing numbers. And KINDERCOMP will delight kids with color-



ful rewards, as the screen comes to life when correct answers are given.

As a parent, you can enjoy the fact that your children are having fun while improving their reading readiness and counting skills.



FACEMAKER™ makes faces fun. Ages 4 to 12.

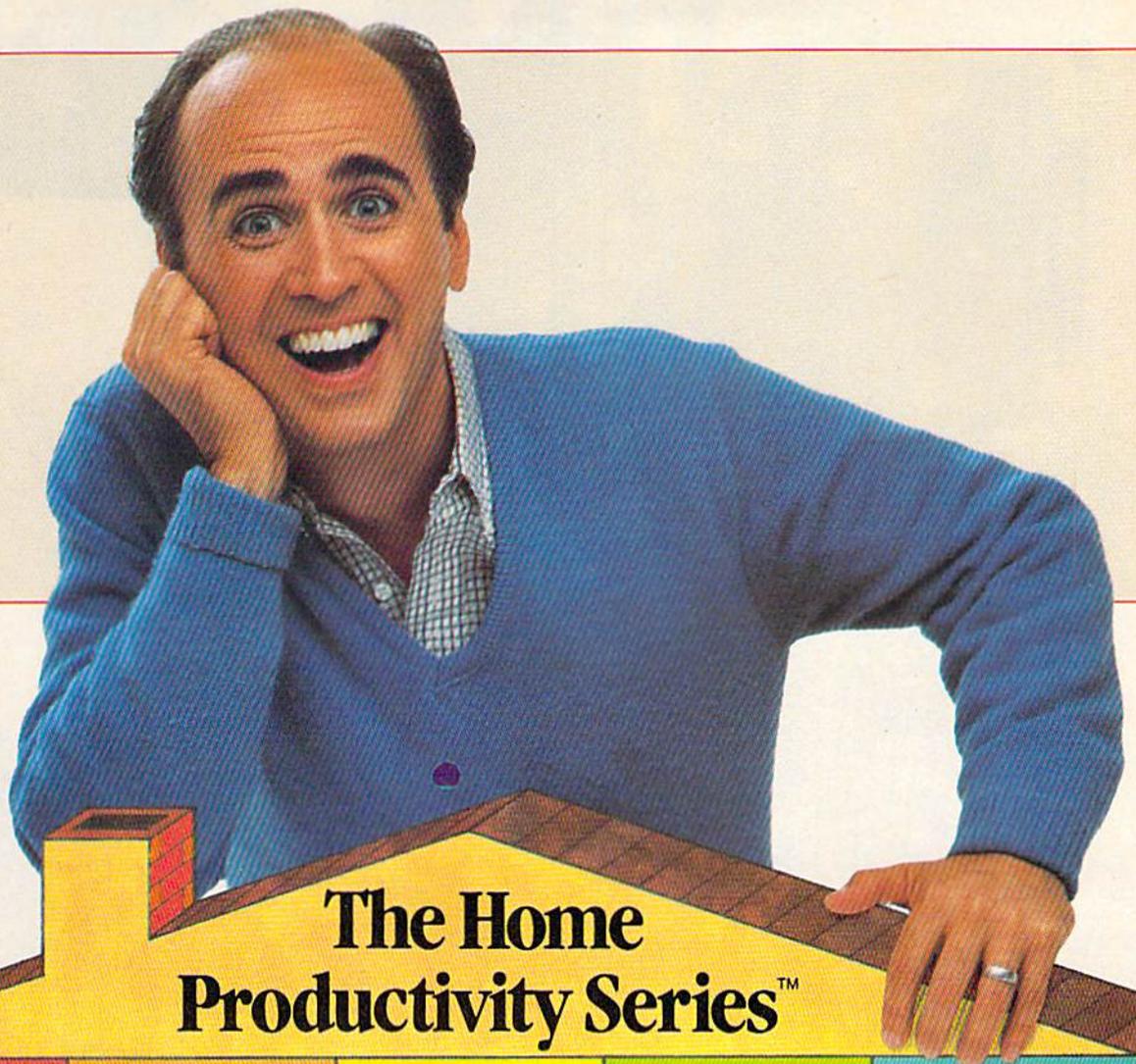


FACEMAKER lets children create their own funny faces on the screen. Once a face is completed, your children will giggle with delight as they make it do all kinds of neat things: wink, smile, wiggle its ears, or whatever their imagination desires.

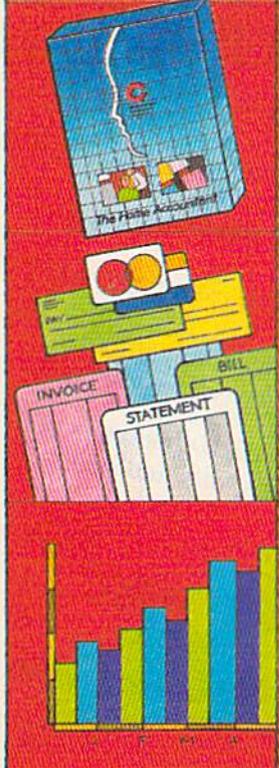
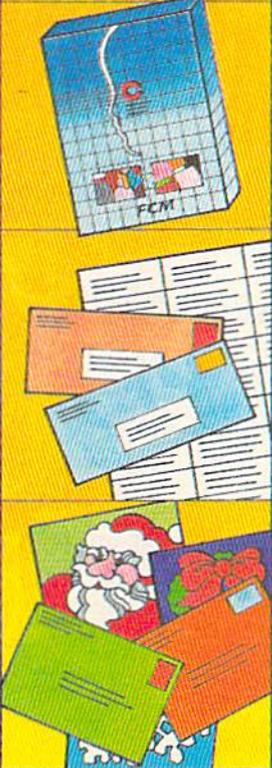
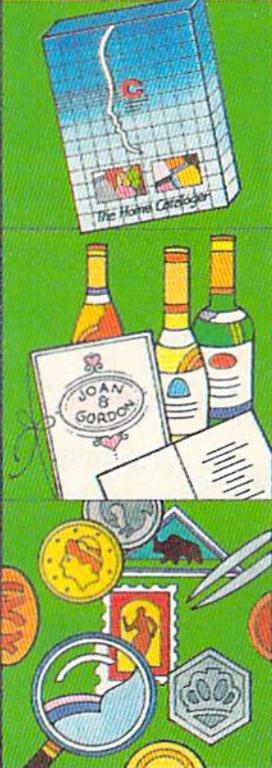


Plus, FACEMAKER helps children become comfortable with computer fundamentals such as: menus, cursors, the return key, the space bar, simple programs, and graphics. FACEMAKER won't make parents frown because their children will have fun making friends with the computer.





The Home Productivity Series™

The Home Accountant™	The Tax Advantage™	FCM™	The Home Cataloger™	Learn To Type™
				



Get more out of your new Commodore. Get Star's Gemini-10X personal printer.

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Steven Clarke—San Francisco, California

With Star's Gemini-10X printer you get 120 characters per second of clean, crisp type, multi-function versatility and steady, dependable service. All at a price that works. It's everything you need in one printer.

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With The Home Productivity Series,[™] I saved money on our taxes, figured out our net worth, cataloged my wine collection, sent out 253 Christmas cards, and taught our kids to type.

Think of The Home Productivity Series as your personal survival kit. It will make your computer an indispensable tool and open up a whole new world for you and your family.

The Home Accountant[™]

Do you ever wonder why your paycheck never seems to last as long as it should? Or why you're never able to save as much as you'd like—even though you earn good money?

It's tough to keep track of each dollar. But unless you do, you'll never be able to gain control of your finances and get ahead.

The Home Accountant, #1 bestselling home finance package, is the best way there is to organize and maintain your financial records. Because it keeps tabs on every penny you spend and earn, you'll always know where you stand.

The Home Accountant flags transactions for tax time, prints net worth and financial statements, handles multiple credit cards and checking accounts and has up to 200* budget categories.

In fact, The Home Accountant has helped over 300,000 people master their finances and make their lives easier.

Price: from \$74.95*

The Tax Advantage[™]

Do you dread doing your taxes? You don't have to anymore.

The Tax Advantage, another bestseller from The Home Productivity Series, makes doing your taxes a cinch. Even if you've never done your taxes by yourself or used a computer before.

As an added plus, The Tax Advantage works with The Home Accountant. So if you've been using The Home Accountant year-round, you can automatically transfer your records to The Tax Advantage and polish off your tax return in no time.

The Tax Advantage takes you line by line through the 1040 and other commonly used tax forms. Not only does the program explain every line, it automatically computes your taxes with each entry you make. So you can see how each line affects your overall picture. The Tax Advantage also does income averaging with a few simple commands.

Price: \$69.95

FCM[™]

FCM is more than just the best mailing list program you can buy. It's the most versatile.

Because FCM is so flexible, you can create your own mailing labels and customize them to look the way you want. You can even add a special message line that says "Merry Christmas" for your Christmas card mailing. FCM can also print the address and message right on your envelope.

FCM works with many popular word processing programs, so you can automatically combine form letters with your mailing list. It's ideal for use in business as well as at home.

FCM is a great organizer and is super for remembering things. For instance, if you are planning a wedding or party, FCM will send out the invitations, record the RSVPs, arrange the seating, let you know whose gift you received and allow you to check off thank you notes. FCM is great to have around.

Price: from \$49.95*

The Home Cataloger[™]

If you have a hard time getting organized, it's time to check out The Home Cataloger. It'll keep track of everything you own like books, wine collections, household inventories and video cassette/tape collections, to name a few.

Because it's such a flexible and easy to use program, The Home Cataloger is a terrific way to teach your children how to look after their belongings—while they learn how to use the computer.

To help you out, The Home Cataloger comes with 10 ready-to-use cataloging formats for some of the most common uses: telephone list, inventory, travel plans, restaurants, insurance policies, coins, growth (height and weight), running, studies, and book list. If you want additional categories, just add them on.

The Home Cataloger. It's the best way to organize your whole house.

Price: from \$49.95*

*depending on hardware

Learn To Type[™]

If you don't learn to type, you'll be left behind by the computer revolution. But if your children never learn, the consequences will be worse.

When we developed Learn To Type, we made it as easy and unthreatening as possible. In fact, the beginning section of Learn To Type assumes you've never touched a keyboard before.

The program uses prompts to help you, and has a drill and practice section that rates you on words per minute, telling you which fingers are slow and which are fast. You can even test your progress with the fun to play game, Eraser Man[™]. Kids love it!

Plus you've got a choice of the keyboard layout you want to learn to type from—DVORAK or QWERTY.

Don't be left behind. Get Learn To Type.

Price: \$39.95

Stop by your nearest dealer and ask about The Home Productivity Series. It's a must for computer age survival.

Available for: Apple, IBM, Atari and Commodore computers. For other versions, check with your dealer or Arrays, Inc./Continental Software.

For more information and a free product brochure for The Home Productivity Series, call or write:



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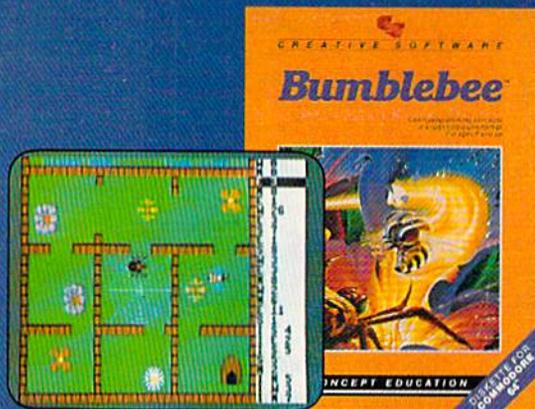
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For Commodore 64™, IBM PC™ and IBM PCjr™, and Apple™

Bumblebee is a highly interactive game which provides learning in a fun environment. That's what we call Concept Education.

Bart the Bee will demystify the programming process and teach your kids basic concepts without complex computer language. The player controls Bart by giving him instructions on how to move from flower to flower, picking up "pollen points." Bart's flight pattern must be carefully designed to avoid bumping into walls or becoming an unfortunate meal for Olga the Spider or Phineas the Frog.

Bumblebee requires logical "if-then" thinking. Your child is rewarded for accuracy and expediency and challenged by increasing levels of difficulty.

We call it concept education. Your kids will call it fun.

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*=General, V=VIC-20, 64=Commodore 64.

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EDITOR'S NOTES

It doesn't seem that long ago that we were writing a farewell editorial to Commodore founder Jack Tramiel as he left Commodore amid speculation of a rift that forced his departure. Official word at the time was that he wanted to withdraw from the field and travel the world. Right. As we are all now aware, Mr. Tramiel has completed negotiations with Warner Communications to purchase their struggling Atari computer operation. What does this mean for the industry in months ahead?

Ups And Downs

Jack Tramiel has unequivocally demonstrated his ability to understand, react, and even *drive* this market. He brought us, over the years, the first fully self-contained (single package) home computer. And, across those same years, as price points were successively broken down from the high hundreds of dollars to the high tens of dollars, his aggressive leadership and product introductions gradually broke down the industry as well. The roster of casualties ranged from Texas Instruments to a significantly weakened Atari—which moved from reliably delivering millions in profit for parent Warner to millions in losses to parent Warner.

In what must provoke a sense of Alice staring through the looking glass, we now have Mr. Tramiel buying, for what really amounts to promises of things to come (e.g., massive debt restructuring), a company

that he beat down to affordability. It's an interesting world. One suspects that Mr. Tramiel—always the fiercest of competitors—may take some personal satisfaction in taking on his former namesake, Commodore, and those who implicitly or explicitly helped prod him out.

What Happens Now?

We expect there will be some senior level personnel changes at Atari. This has, in the past, been a significant "touch" of Jack's. We expect to see, in a matter of weeks or months, a gathering cloud of activity at Atari. A bit of price cutting perhaps? A hint of a new machine or two? Time will tell. Caution will have to be invoked somewhere along the line here, because, at least for now, there's a critical variable missing. A major factor in Commodore's success, and a key to Mr. Tramiel's ability to make the kinds of competition-crushing moves that gave him market leadership in the past, was what used to be a small, independent company named MOS Technology.

Commodore, aka Jack Tramiel, acquired MOS Technology back in the seventies in a stroke that eventually made them what they are today. Among other things, MOS brought us the 6502 microprocessor (long the heart of PETs, Apples, Ataris, etc.). And, more importantly, it brought

Jack Tramiel the central nervous system of his philosophy of vertical integration. Over the years, his only competitor with the same capability for inhouse chip manufacturing was TI, and they never quite mastered the art the way Jack did. We would suggest that the ownership of MOS was crucial to his continued success by providing the controllable foundation for aggressive development and price control.

To this extent, the Atari acquisition suffers, but we expect it won't be fatal. Within the traces of microcomputerdom, Jack Tramiel is a skilled street fighter, and we suspect that, before the dust settles, an emerging Atari will return with vigor and vengeance.



Editor In Chief

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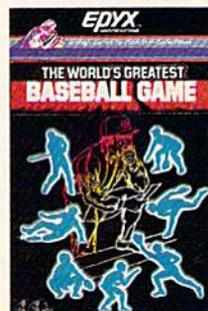
an opponent or the computer. Two modes let you choose between managing and controlling your team or managing only. The World's Greatest Baseball Game—everything you could ever want except the hot dogs and peanuts.

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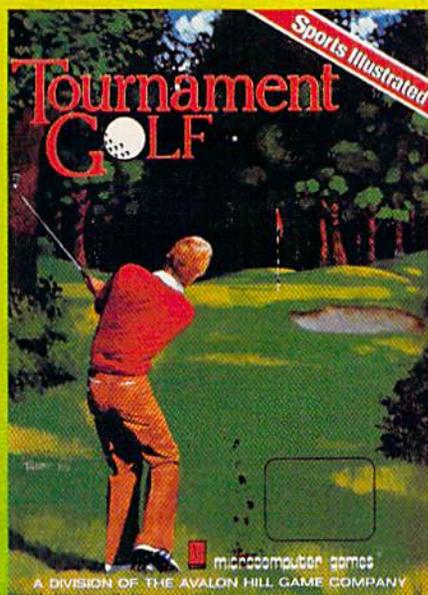
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GAZETTE FEEDBACK

Editors And Readers

Do you have a question or a problem? Have you discovered something that could help other VIC-20 and Commodore 64 users? Do you have a comment about something you've read in COMPUTE!'s GAZETTE? We want to hear from you. Write to Gazette Feedback, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403.

More On Disk Saves

In our July Feedback column ("Incomplete Disk Saves"), we reported that use of the VALIDATE command will purge relative files. However, after several tests, we found that this command does not seem to adversely affect relative files. It appears that disks containing relative files can be validated; it is only random files that are purged.

Read Only Memory

I own a Commodore 64, and I have two friends who own VICs. We would like to know if we can get into ROM and read the Read Only Memory.

R.K.C.

Read Only Memory (ROM) is just what the name implies—memory that can be read (PEEKed) but not written to (POKEd). ROM is used by the computer; the operating system is a good example of this. BASIC ROM (locations 49152–57343 in the VIC, and 40960–49151 in the 64) and Kernal ROM (locations 57344–65535 in both) contain the programs which control BASIC and the other functions of the computer.

Because these two blocks of memory are so important to the operation of the computer, they were designed so that you can't POKE new values there. Altering the contents of these locations would interfere with, or temporarily stop, the normal operation of the computer.

As the name implies, there is nothing to stop you from reading the contents of ROM. Remember, however, that the ROMs contain only machine language. You can't LIST the contents as you would a BASIC program. You could use a disassembler program to make the machine language easier to interpret, but you will understand little of what you see unless you are familiar with ML.

Elusive MPS-801 Printer Ribbons

As a recent purchaser of a Commodore MPS-801 printer, I've found that replacement ribbons are very hard to find.

For interested readers, I suggest using ribbon cartridges for the Radio Shack DMP-110 Printer, part number 26-1283 from Radio Shack. This ribbon is an identical replacement.

George J. Manning

Thanks for the tip. We purchased one of these ribbons and it seems to work well with the MPS-801. We continue to receive many letters about the availability of MPS-801 replacement ribbons. Our readers can surely use this information.

Machine Language POKES

I am just starting to program in machine language. I would like to know the machine language equivalent of the BASIC POKE statement.

Jeff Schiller

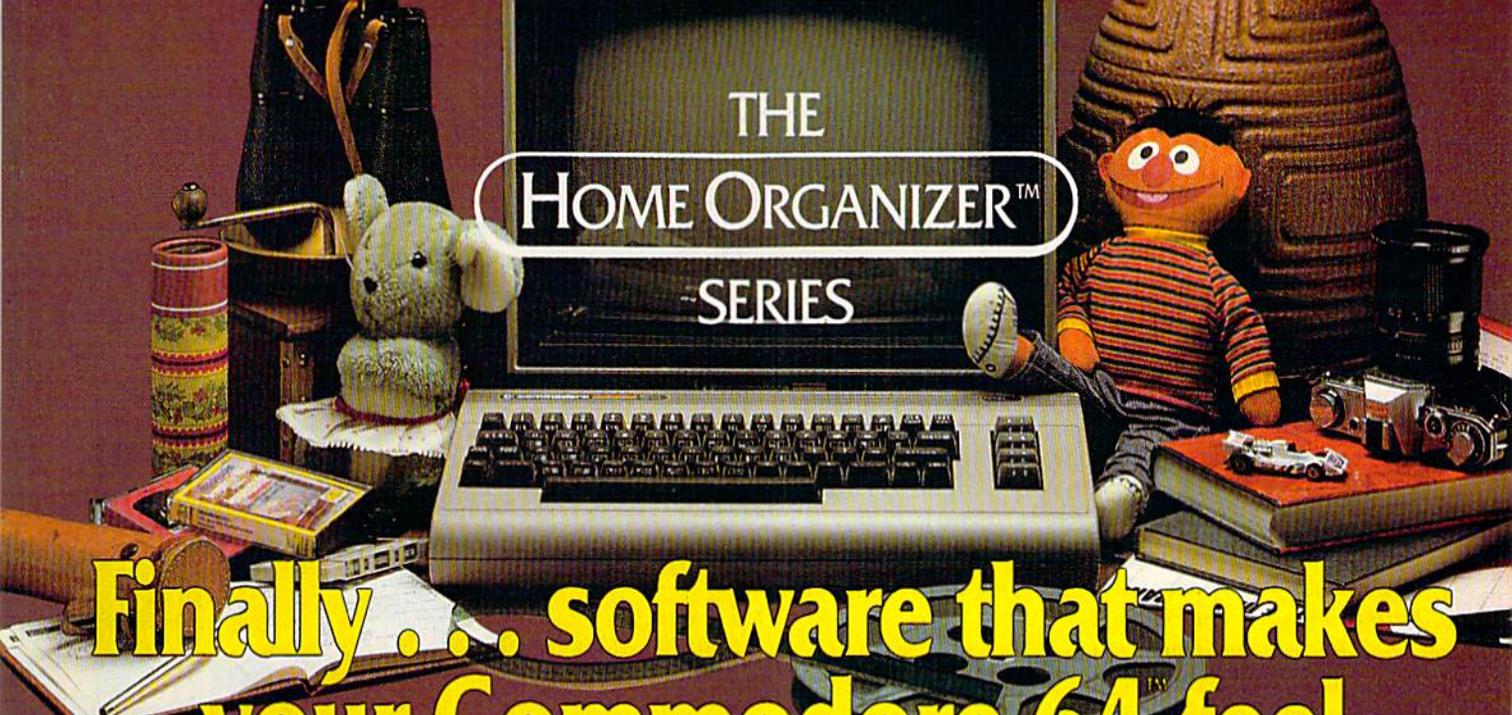
The machine language equivalents of the BASIC POKE are the store instructions (STA, STX, and STY). These will store (copy) the contents of the accumulator (STA) or the X or Y registers (STX, STY) into the memory location you specify. The general format for these instructions is: STr \$address (where r is the register, and \$address is the address in hex to be POKEd).

For example, STA \$C000 would store the current contents of the accumulator into location \$C000 (decimal 49152), and STX \$00 would store the contents of the X register into memory location zero.

You could simulate the BASIC statement POKE 53281,1 (which will set the Commodore 64's screen background to white) with:

```
LDA #$01
STA $D021
```

In addition to absolute stores, there are a variety of ways to use an index. For example, if the X register contains a three, STA \$C000,x puts the number in the accumulator into \$C003. By changing the value of X, you can create the machine language equivalent of a FOR-NEXT loop.



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PEEKing Time

I own a Commodore 64, and I am just starting to learn machine language. I have a question about the time (TI\$) function. What location in memory do you look at to get the current value for the TI\$ function?

Corey McKinnon

BASIC's time variables (TI\$ and TI) return the current value of a built-in interval timer. PRINT TI returns a numeric value showing the current timer count in increments called jiffies, where one jiffy is 1/60 second. Thus, to display the contents of the timer as seconds, you would type PRINT TI/60.

PRINT TI\$ returns the value of TI translated into a string of characters representing the time in hours, minutes, and seconds.

The interval timer is found at memory locations 160-162 (hex addresses \$A0-\$A2) in both the VIC and 64. Location 160 ticks once every 1092 seconds (65536 jiffies), location 161 ticks every 4.26 seconds (256 jiffies), and 162 ticks every jiffy (sixty times a second). BASIC determines the value of TI by performing the equivalent of:

$$TI = \text{PEEK}(160) * 65536 + \text{PEEK}(161) * 256 + \text{PEEK}(162)$$

It then determines the value of TI\$ from the value of TI, so there are no locations which actually hold the current value of TI\$. That is, there are no locations in the computer holding the time in hours-minutes-seconds format.

You can read the clock from machine language simply by examining the contents of locations 160-162. You can also use the built-in Kernal ROM routines RDTIM (\$FFDE) to read the clock or SETTIM (\$FFDB) to set it. See the VIC or 64 Programmer's Reference Guide for more details. However, in either case, you will have to do some manipulating if you want the time in seconds instead of jiffies.

You should be aware that the clock stops running during tape SAVES and LOADS. If you set the clock and then perform one of these tape operations, the time value will be incorrect.

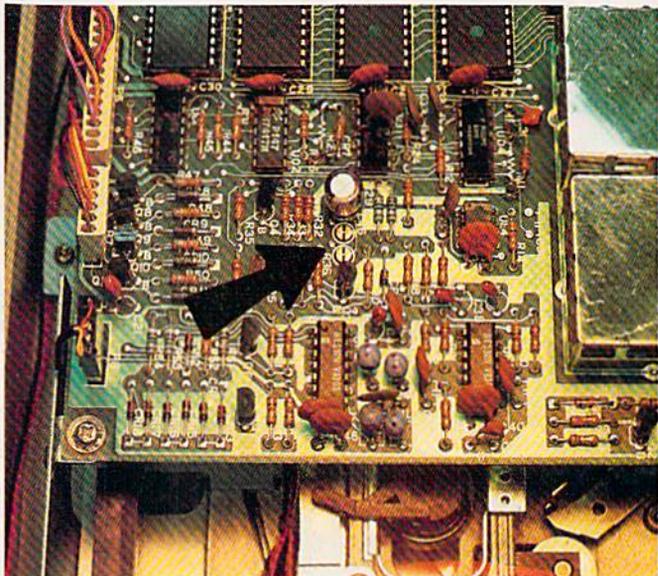
Disk Drive Device Number Change

I have two 1541 disk drives and want to change the address of one of them via the hardware method. I followed the instructions in the owner's manual, but can't tell which wires are the jumpers in question. Please help.

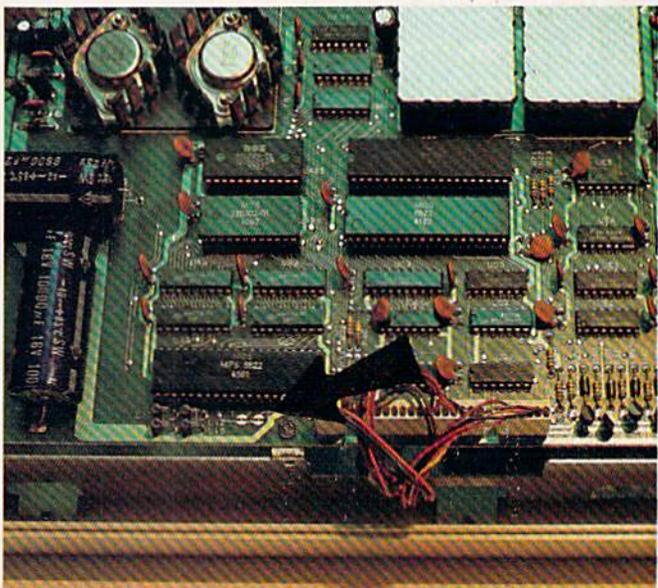
Nolan L. Green

The instruction manual's reference to jumpers might be misleading. The "jumpers" are actually two round disks of solder, each about 1/4 inch in diameter. Each disk is separated into halves, with a thin strand of solder connecting each half.

Unplug the power cord from the wall and open the disk drive following the instructions in the user's manual. On the older (white case) model 1541s, the jumpers are found on the left edge of the circuit board, just behind the long plugs with wires. On the newer (tan case) model 1541s, they are found near the center of the circuit board, toward the front. On both models, jumper 1 is nearest the front.



On the newer models, they can be found in the middle toward the front.



On the older 1541, the jumpers are on the left edge, to the rear.

Changing the device numbers is accomplished by taking a sharp, pointed object and scratching away the thin strand of solder connecting the two halves on one or both of the jumpers. Do this very carefully so as not to damage the circuit board or any other components.



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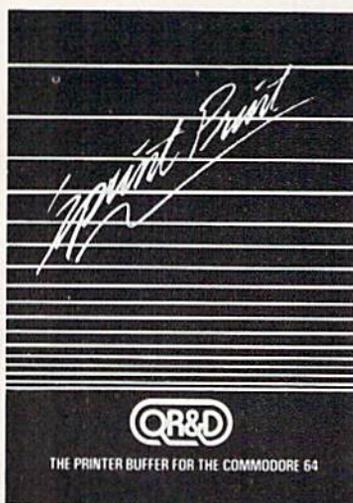
Here's a chart showing which device numbers are produced when the jumpers are cut:

JUMPER CUT	NEW DEVICE NUMBER
None	8
1	9
2	10
1 and 2	11

Changing the disk drive device numbers via the hardware method is permanent unless you're handy with a soldering iron. So don't do so unless you have to. If you're unsure about exactly what you're doing, have your local Commodore dealer do the modifications for you. 

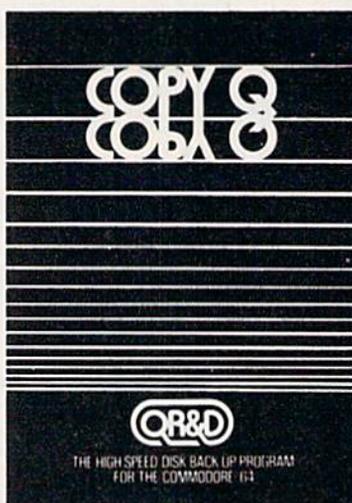
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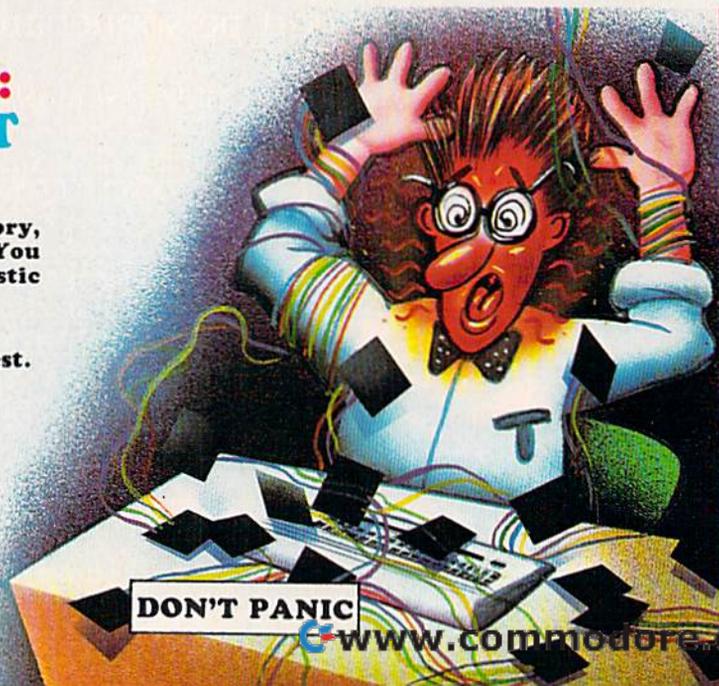
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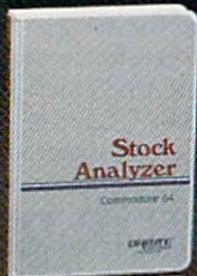
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The Summer Consumer Electronics Show:

A Smorgasbord For The 64

Lance Elko, Editor

The feast is on for owners of the Commodore 64. The Summer Consumer Electronics Show (CES) held this June in Chicago introduced a spread of new software and hardware that will delight (and perhaps bewilder) 64 owners.

This new wealth of choice is a testament to the growth of a computer regarded by some industry experts as a toy. "People have equated low cost with low quality," says Neil Harris, Commodore's new product design manager. But the success of the 64 has surprised even Commodore.

What worked against the 64 in its early days was the lack of software—not a problem with some other home computers, such as the Apple. But the 64 outlived a year of software famine. By Christmas of 1983, consumers had a fair choice of a lot of average programs and a few really good ones. As the 64's

Nearly 100,000 eager people crowded Chicago's McCormick Place at the Summer CES to see what's new in computers and audio and video electronics. For Commodore 64 owners, there's a lot of good news. Not so for VIC owners. Here's a summary of new products and trends, and what to look for in the months ahead.

popularity continued to grow into the new year, more and better software entered the market. Innovative design and programming, exploiting all the 64's features, translated into hotter competition for the consumer's software dollar. And this culminated at CES in a colossal smorgasbord of new products.

Although 64 owners now have a bigger and better menu, the news was not so bright for

VIC-20 owners. Commodore says it stopped manufacturing VICs in the Spring, and that leftover inventories probably would be sold by Fall. VIC users will have to be satisfied with software that's already available, write their own programs, or buy another computer. A few new products were announced for the VIC at CES, but you could count them on one hand. According to one Commodore representative, VIC sales in the U.S. had been dropping dramatically, while the 64 grew to dominate the low-end market.

Commodore presented two new computers at CES: the Commodore Plus/4, originally introduced as the Commodore 264 at the January CES, and the Commodore 16, a scaled-down version of the Plus/4. Plans for the 364, also announced in January, have been shelved.

The Plus/4 is an interesting machine and somewhat of a departure for Commodore. Named



Commodore's new Plus/4 is aimed at the more applications-oriented user.



The Commodore 16 hopes to pick up the low-end market where the VIC left off.

for its four built-in programs—a data base manager, spreadsheet, word processor, and business graphics package—the Plus/4 has been dubbed “the productivity machine.”

“Some people want practical applications and less fun and

games,” explains Harris. The built-in software, originally titled 3 + 1 and designed by Tri-Micro, is integrated so that you can use *File Manager* (the data base manager) or the spreadsheet with the word processor. And *Graphics* is designed

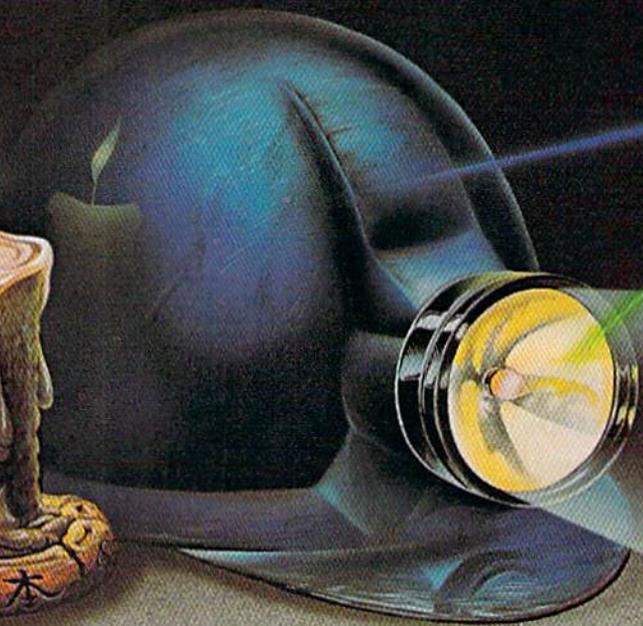
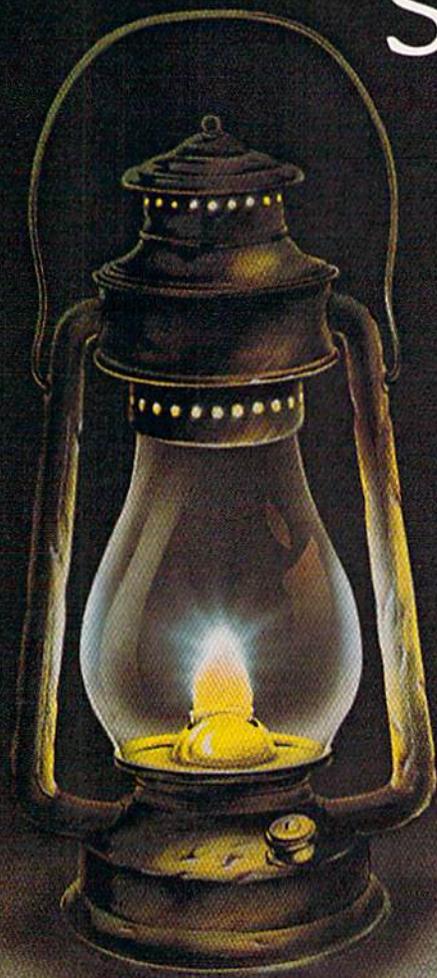
so you can display graphs from calculations performed with the spreadsheet.

Although some people feared the Plus/4 would replace the 64, Commodore contends the new machine is aimed at a different audience—those whose primary needs are for business applications. The Plus/4, however, contains a few of the features of the 64: eight function keys, the keyboard graphics character set, and a 320 × 200 pixel high-resolution graphics screen. What’s different is a new BASIC (known as 3.5) which adds new commands (75 in all), including 11 graphics commands similar to those available with Simon’s BASIC and the 64 Super Expander. It has 64K of memory, with 60K of that available for BASIC programming. Like the Commodore 64, the Plus/4 has 16 colors, but each one now has eight luminance levels for a total of 128 separate hues. Screen windowing capability and a 12-command machine language monitor are also included.

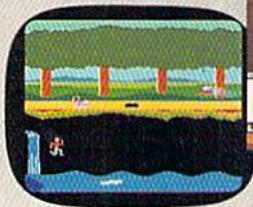
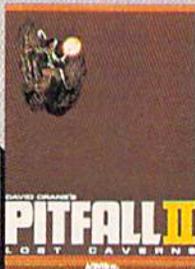
The keyboard has a different look and feel from the 64. The function keys, one of which is labeled HELP, are placed horizontally above the keyboard. Four separate arrow-shaped cursor keys should eliminate the tedium of SHIFTING when editing on the screen. A second CONTROL key is in place of the RESTORE key found on the 64, and an ESCAPE key has

INTRODUCING ACTIVISION

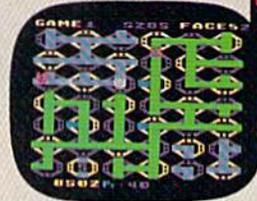
SEE YOURSELF IN A



You leave the sun behind as you lower yourself down into the unexplored caverns beneath the Peruvian jungle. Deeper and deeper you go. Past Amazon frogs, condors, and attacking bats. Across eel-infested underground rivers. From cavern to cavern, level to level. Swimming, running, dodging, stumbling, you search for the gold, the Raj diamond and the thing you really treasure... adventure. Head for it. Designed by David Crane.



You have heard the elder speak of one central source and a maze of unconnected grey paths. As you connect each grey path to the central source, what was grey becomes the green of life. When all are connected, then you have achieved "Zenji." But beware the flames and sparks of distraction that move along the paths. You must go beyond strategy, speed, logic. Trust your intuition. The ancient puzzle awaits. Designed by Matthew Hubbard.

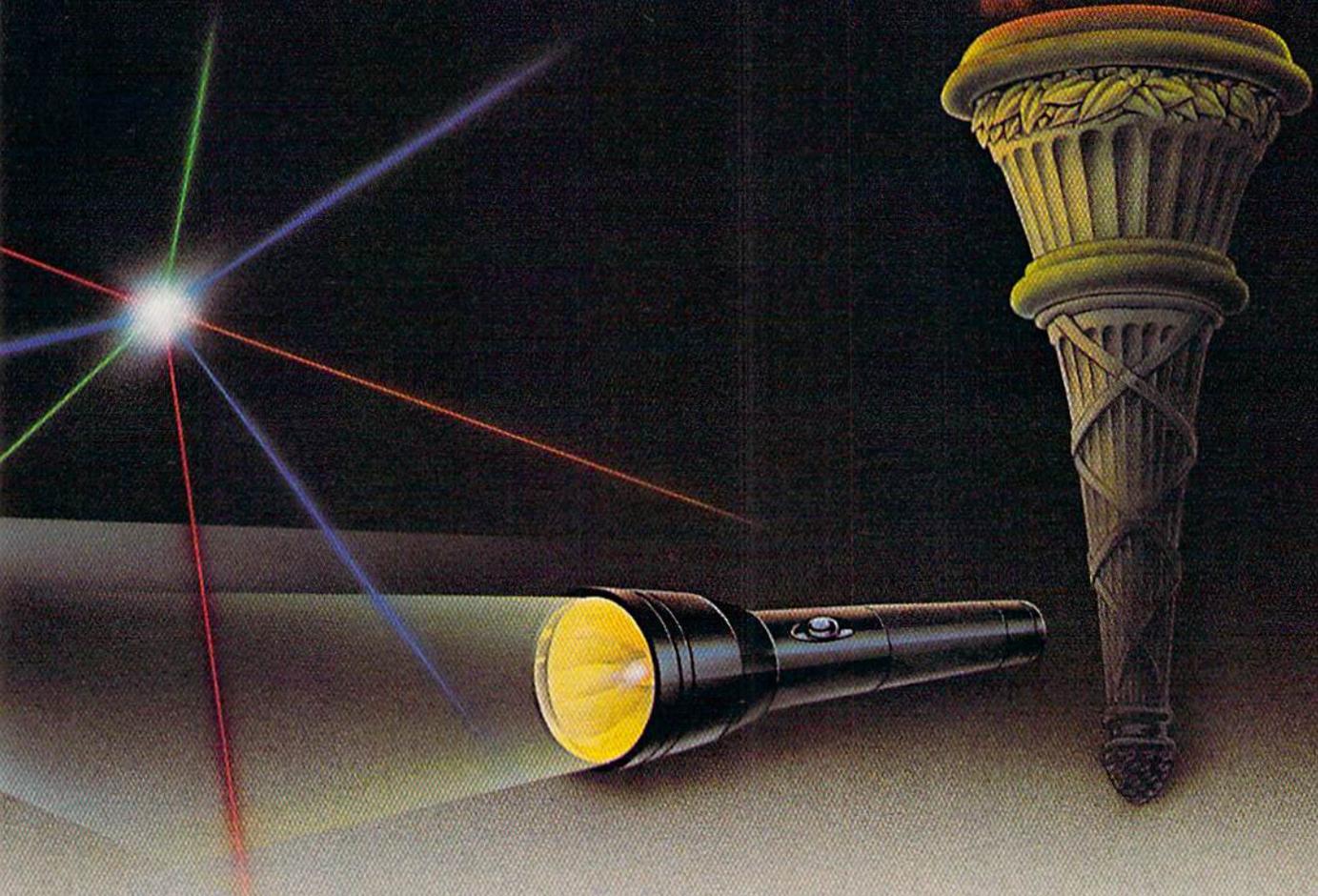


You strap on your helicopter prop-pack, check your laser helmet and dynamite. There's no predicting what you'll have to go through to get to the trapped miners. Blocked shafts, molten lava, animals, insects, who knows what lies below. But you'll go, you're in charge of the Helicopter Emergency Rescue Operation. The miners have only one chance. You. The opening shaft is cleared now, it's time to go. Designed by John Van Ryzin.



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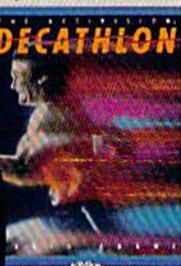
As you suit up you see the webbed forcefield surrounding your planet. Holding it. Trapped with no escape. No hope. Except you: The Beamrider. The freedom of millions depends on you. Alone you speed along the grid of beams that strangle your planet. You must destroy the grid sector by sector. Your skills and your reflexes alone will determine the future of your people. Take their future in your hands. Designed by Dave Rolfe.



You can almost hear the quiet. And it's your job to keep it that way. A toy factory at midnight. Did you hear something? Guess not. Wrong! Suddenly balloon valves open, conveyor belts move and a whole factory full of toys goes wild. Even the robot, their latest development, is on the loose and after you. Capture the runaway toys. Restore order. Restore peace. Restore quiet. Do something! Hurry! Designed by Mark Turmell.



You made it. The Olympics. You hear languages you've never heard. And the universal roar of the crowd. You will run. Hurl. Vault. Jump. Ten events. One chance. You will push yourself this time. Further than ever. Harder than ever. But then... so will everyone. The competition increases, now two can compete at the same time. The crowd quiets. The starting gun sounds. A blur of adrenalin. Let the games begin. Designed by David Crane.



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been added above the left CONTROL key.

Perhaps to further differentiate the Plus/4 from the 64, Commodore has left out sprites and the SID synthesizer chip. Instead, the Plus/4 has a tone generator similar to the VIC's, but with improved pitch accuracy.

The Commodore 16 (for its 16K RAM) is effectively a stripped-down version of the Plus/4. Dubbed "the learning machine" by Commodore, the 16 contains the same BASIC 3.5 as its bigger brother as well as the built-in machine language monitor and screen windowing capability. A rear port allows memory expansion up to a full 64K. Commodore sees this machine as a replacement for the VIC-20 and as an entry level computer for novices who aren't sure about spending a lot of money. Commodore will offer a variety of educational and recreational programs for the 16. It should be available this Fall and sell for about \$100. The Plus/4 should appear at the same time for about \$300.

Third-party software support will depend on the computer's fate in the marketplace. Obviously, there won't be a great demand for the kind of software already packaged with the Plus/4, but Commodore has already announced over 40 programs for the new machine. Many of the new titles are revisions of 64 programs: *General*

Learning, Learning Everywhere: Educational Software For Commodore From CES

Selby Bateman, Features Editor

If you own a Commodore 64, prepare to get educated. June's Consumer Electronics Show in Chicago included dozens of companies with hundreds of educational software packages for the Commodore 64 computer. Here's a brief look at some of the players and programs from CES.

There's an educational emphasis throughout the entire micro-computer market, says Neil Harris, new program design manager for Commodore.

"Educational programs now exploit the computer," he says. "And educational games have caught up to [entertainment] games in quality."

Harris ought to know. He has seen firsthand how the attractiveness of the Commodore 64's huge installed base has translated into a flood of educational programs targeted toward users of the machine. And these packages take a variety of forms: curriculum-based software, educational games, "edutainment" packages, drill-and-practice programs—the list is extensive and confusing.

The range of companies producing these programs is also wide. They include small start-up firms composed of current or former educators, large productivity or entertainment software producers who are entering the educational market, and established educational book publishers who want to carry their reputations and expertise into the computer field.

As most software producers will admit, the quality of all these products varies tremendously. And even among well-produced educational programs, the target audiences must be carefully selected. But, in general, the fierce competition among educational software producers appears to be creating a higher level of quality in recent program offerings. And concerned educators are having more of an effect on the market as a whole. (See next month's GAZETTE for a look at some of the new directions in educational software.)

Here, then, are a few of the companies and their educational products for the Commodore 64:

American Educational Computer—This Palo Alto, California, based company is one of the largest developers and publishers of curriculum-based educational software for the school and consumer markets.

At CES, AEC introduced a series of advanced spelling programs for use on the 64 and other home computers. Called

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Until Mitey Mo, Commodore's 1650 Automodem was the obvious choice when you went looking for a modem for the C-64. Like Mitey Mo, it has "auto-answer"—it receives data while unattended. And both modems are "auto dialers"—you dial right on the computer's keyboard. But that's about where their similarity ends.

Suppose you dial a number,



MODEM FEATURES	USI MITEY MO	COMMODORE AUTOMODEM
Auto Dial	YES	YES
Auto Answer	YES	YES
Auto Redial	YES	NO
Smooth Screen Scrolling	YES	NO
Both Cassette and Diskette Software Included	YES	NO
Menu Driven	YES	NO
24K Software Buffer	YES	NO
Function Key Template	YES	NO
Printing Capability	YES	NO
Easy-to-Use Manual	YES	NO
Bell 103 Compatible	YES	YES
Multiple Baud Rates	YES	YES
Dual Cables Included	YES	NO
Single Switch Operation	YES	NO
Warranty	3 years	90 days

Some mighty interesting features—ours and theirs. Yours to decide.

and you find that it's busy. Mitey Mo has "auto redial"—it hangs up and redials immediately until it gets through. With the other modem you have to redial each time—and somebody with auto redialing can slip in ahead of you.

Mitey Mo is menu-driven. It lists the things you can do on the screen. Select a number and you're on your way. Since Automodem isn't menu-driven, you'll be hunting through the manual a lot.

Mitey Mo has only one switch, the customized software does the rest. Every family member will find it

easy to use. With the other modem you'll have to remember to check three switches, otherwise you may be answering when you mean to be originating.

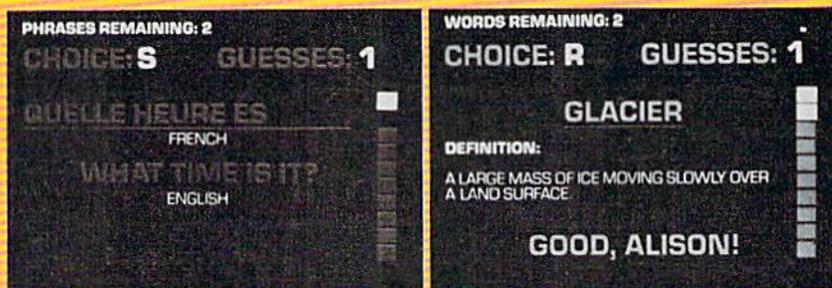
Mitey Mo gives you access to twelve pages of memory (24,000 bytes), so you can store data and review or print it later. The other modem doesn't let you store or print anything.

Mitey Mo is half the size of the other modem. The very latest technology allows miniaturization and increased reliability, as well. Mitey Mo is so reliable, we gave it a three-year warranty. The other modem gives 90 days, then you're on your own.

Not only will you find Mitey Mo mighty useful, you'll find it mighty reasonably priced. When you consider how much more you get for the money, there's really no other choice.



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Brisbane, CA 94005
(415) 468-4900
www.commodore.ca



The Matchmaker Series from American Educational Computer uses a variety of quiz formats to address most subjects in standard elementary and junior high curricula.

Ledger, Logo, Zork I, II, and III, Wizard of Wor, Gorf, Deadline, Magic Desk II, Easy Script/Plus, Easy Calc/Plus, and others.

A brand new offering exclusively for the Plus/4 is a series called "vertical market application templates." These disk-based programs are designed for specific applications such as manufacturing, the retail industry, personal financial planning, construction, maintenance and service, and professional services. A variety of new educational programs for the Plus/4 will also be available.

Disk-based software for the Plus/4 will run on the new parallel-interface SFS 481 disk drive (not 64 compatible). This drive is significantly faster than serial-interface 1541 disk drives. A new letter-quality daisywheel printer, the DPS 1101, is also designed for the Plus/4. It prints at 18 cps (characters per second) and features proportional spacing which can be selected manually from the front of the machine.

Several other printers were announced by Commodore: the MPS 802, a bi-directional impact dot matrix printer which can print at 60 cps; the MCS 801 color dot matrix printer (see "Horizons 64" elsewhere in this issue for a close-up look); and the MPS 803, a dot matrix printer designed for use with the Commodore 16.

Other new hardware includes the 1531 Cassette Unit

AEC Spelling, the new software teaches the spelling of over 4000 words and allows the user to enter additional words. Using a test-teach-test method of instruction, the spelling series addresses the needs of students in grades two through eight.

AEC also announced the second generation in its Matchmaker series on subjects in standard elementary and junior high school curricula. Aimed at Commodore 64 and other personal computer users at home, the series includes coverage of U.S. Government, World History, Biology, French, and Science I, II, and III. (American Educational Computer, Inc., 2450 Embarcadero Way, Palo Alto, CA 94303.)

DLM Teaching Resources (Developmental Learning Materials)—A publisher of educational materials for more than 15 years, DLM has numerous titles in its series of "Arcademic" Skill Builders and Drill Builders for grades one through six. Among its packages for the 64 are *Alien Addition*, *Meteor Multiplication*, *Demolition Division*, and *Dragon Mix*, all using colorful graphics and action game formats to interest children. (DLM Teaching Resources, P.O. Box 4000, One DLM Park, Allen, TX 75002.)

Koala Technologies—In association with Henson Associates, Inc. (creators of the Muppets) and Sunburst Communications, Koala (producer of the popular Koalapad) introduced a



The Muppet Learning Keys computer keyboard from Koala Technologies teaches the alphabet, numbers, colors, and shapes to children three years and older.

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Games that can be played on your Commodore 64, IBM PC and Apple II. (Some titles available on IBM PC jr. and VIC 20*)

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Then there's *Crystal Castles*™ where Bentley Bear™ journeys through all sorts of tantalizingly difficult paths and ramps in his endless quest for gems.

In *Donkey Kong Jr.*™ by Nintendo,™ Junior tries to rescue his father against immense odds. And speaking of Donkey Kong, there's also *Mario Brothers*™ by Nintendo.™ This time, Mario and his brother Luigi battle creatures on four levels of floors, encountering all sorts of treacherous enemies.

In *Track And Field*™ you can compete by yourself or

head-to-head with another player. But each player must beat qualifying times, heights and distances before they can compete in each of the grueling six events.

Typo Attack is the much-acclaimed, fun-filled program that

allows you to enjoy developing your typing skills at any level.

And still playing to the delight of audiences everywhere are *Pac-Man*,™ *Ms. Pac-Man*,™ *Jungle Hunt*,™ *Battlezone*,™ *Donkey Kong*,™ by Nintendo,™ *Centipede*™ and *Pole Position*™.

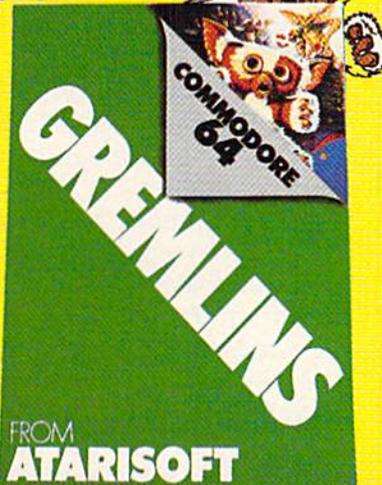
So, if you've been searching for ways to entertain your Commodore, Apple or IBM, treat it to one of the best shows in town, one of the hits from ATARI SOFT.

And don't forget the popcorn.

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*Titles available on IBM PC jr. are Ms. Pac-Man, Centipede, Donkey Kong, Moon Patrol™ and Typo Attack. Available on the VIC 20 is Typo Attack.

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MARIO BROS.

ATARI SOFT
APPLE II

DONKEY KONG JR.

ATARI SOFT
IBM PC

TRACK & FIELD

ATARI SOFT
COMMODORE 64

CRYSTAL CASTLES

ATARI SOFT
APPLE II

TYPO ATTACK

ATARI SOFT
IBM PC

ATARI SOFT

SIX NEW HITS ARE
COMING SOON
TO A COMMODORE 64
SCREEN NEAR YOU.

and the 141 Color Monitor. Both are color coordinated (charcoal gray) to match the 16 and the Plus/4, but are also compatible with the VIC and 64.

Despite the variety of new hardware from Commodore and third-party companies, the mountain of new software drew the most attention at CES. Especially abundant are productivity software and new educational programs (see the accompanying article, "Learning, Learning Everywhere").

Commodore 64 owners can choose from a wide assortment of productivity packages—personal financial programs, data bases, word processors, spreadsheets, and more. Cardco introduced two packages, *File Now*, an easy-to-use data base, and *Graph Now/Paint Now*, a graphics package designed for generating line and bar graphs, and color art. Each is on disk and sells for \$39.95. They are fully integrated with Cardco's *Write Now!* word processor and round out their productivity series, which also includes *Mail Now* and *Spell Now*.

Creative Software announced an integrated productivity series which includes *Creative Writer*, *Creative Filer*, *Creative Calc*, and *Creative Finance*. Retail for each is \$49.95. The company also introduced *EasyDisk*, a menu-driven utility program for the 1541, which enhances and extends the drive's operating system. The price is \$29.95.

children's computer keyboard, Muppet Learning Keys, at CES.

The keyboard attracted much attention at the show, and is available for the Commodore 64 and Apple II family of computers. Preschoolers can learn basic letter, number, shape, and color skills by using the keyboard which plugs into the joystick port on the 64.

Popular Muppet figures such as Miss Piggy, Gonzo, and Kermit the Frog help to attract the child to learning. Each section of the school desk-like keyboard—ruler, water color set, penmanship slate, compass, eraser, and arithmetic exercise book—can be activated by the touch of a child's finger. (Koala Technologies Corp., 3100 Patrick Henry Drive, Santa Clara, CA 95052-8100.)

The Learning Company—One of the most respected names in quality educational software is the Texas-based firm, The Learning Company, most of whose titles have been for Apple computers.

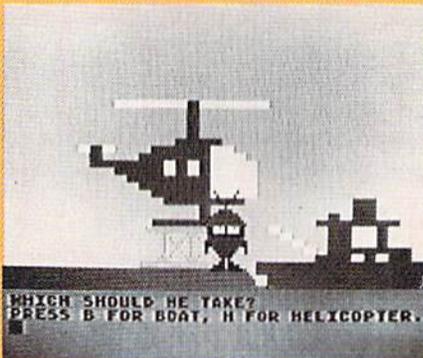
The company has now converted several titles for the 64. There are two programs in The Learning Company's Reading Series now available for the 64: *Juggles Rainbow*, in which children from three to six play with dancing rainbows and whirling windmills to learn reading and math readiness skills; and *Word Spinner*, in which youngsters from six to ten learn the basic building blocks of reading.

Also available for the 64 is *Addition Magician*, a game that teaches children from six to ten the basic concepts of addition and doubles as a number strategy game for older children; and *Moptown Parade*, an electronic logic and discrimination game. (The Learning Company, 545 Middlefield Road, Menlo Park, CA 94025.)

MECC (Minnesota Educational Computing Consortium)—One of the leading publishers of educational software for schools, MECC has more than two dozen educational titles for the 64 and several more coming out this fall. Among the courseware products to be released this fall for the 64 are *Adventures With Fractions*; *Earth Science*; *Pre-Reading*; *The Glass Computer*, which reveals and demonstrates how computers and the BASIC programming language work; *Outdoor Biology*, and *Electronic Money*.

MECC's products include both curriculum-based classroom software and a Home Software Library. (MECC, 3490 Lexington Avenue, St. Paul, MN 55112.)

Mindscape, Inc.—Mindscape is an electronic publishing subsidiary of SFN Companies, one of the nation's leaders in elementary and high school textbook publishing.



Tink's Adventure, part of Mindscape's Sprout line of software for children, incorporates five multilevel learning games as it teaches the alphabet and the computer keyboard.

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Because Infocom's interactive fiction is designed to run on *your* imagination.

That's precisely why there's nothing more interesting, challenging or interactive than an Infocom disk—but only after you've put it in your computer.

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dinarily developed personalities) and original, logical, often hilarious puzzles. Communication is carried on in the same way as it is in a novel—in prose. And interaction is easy—you type in full English sentences.

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interactive story is roughly the length of a short novel in content, but because you're actively engaged in the plot, your adventure can last for weeks and months.

Find out what it's like to get inside a story. Get one from Infocom. Because with Infocom's interactive fiction, there's room for you on every disk.

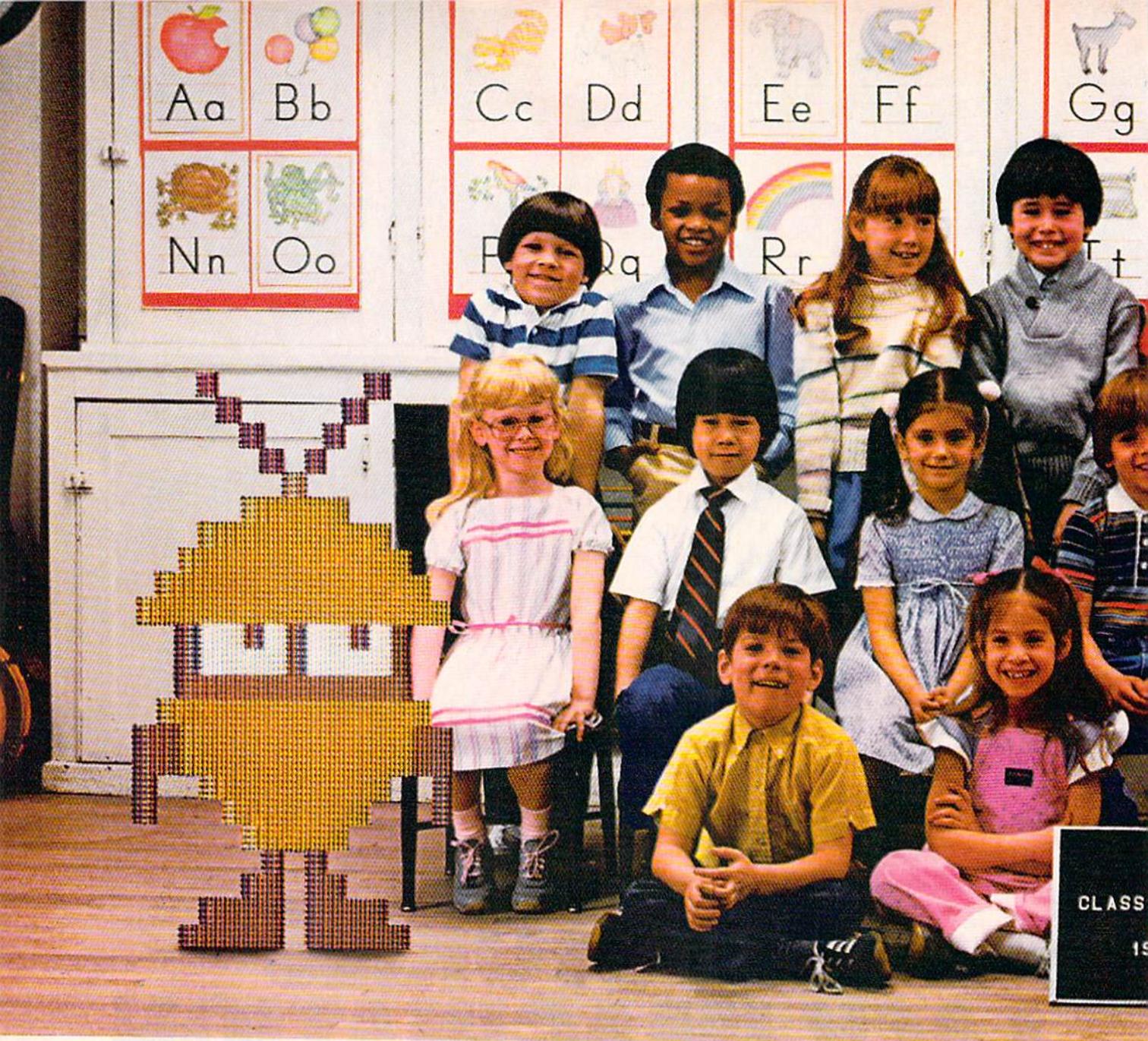


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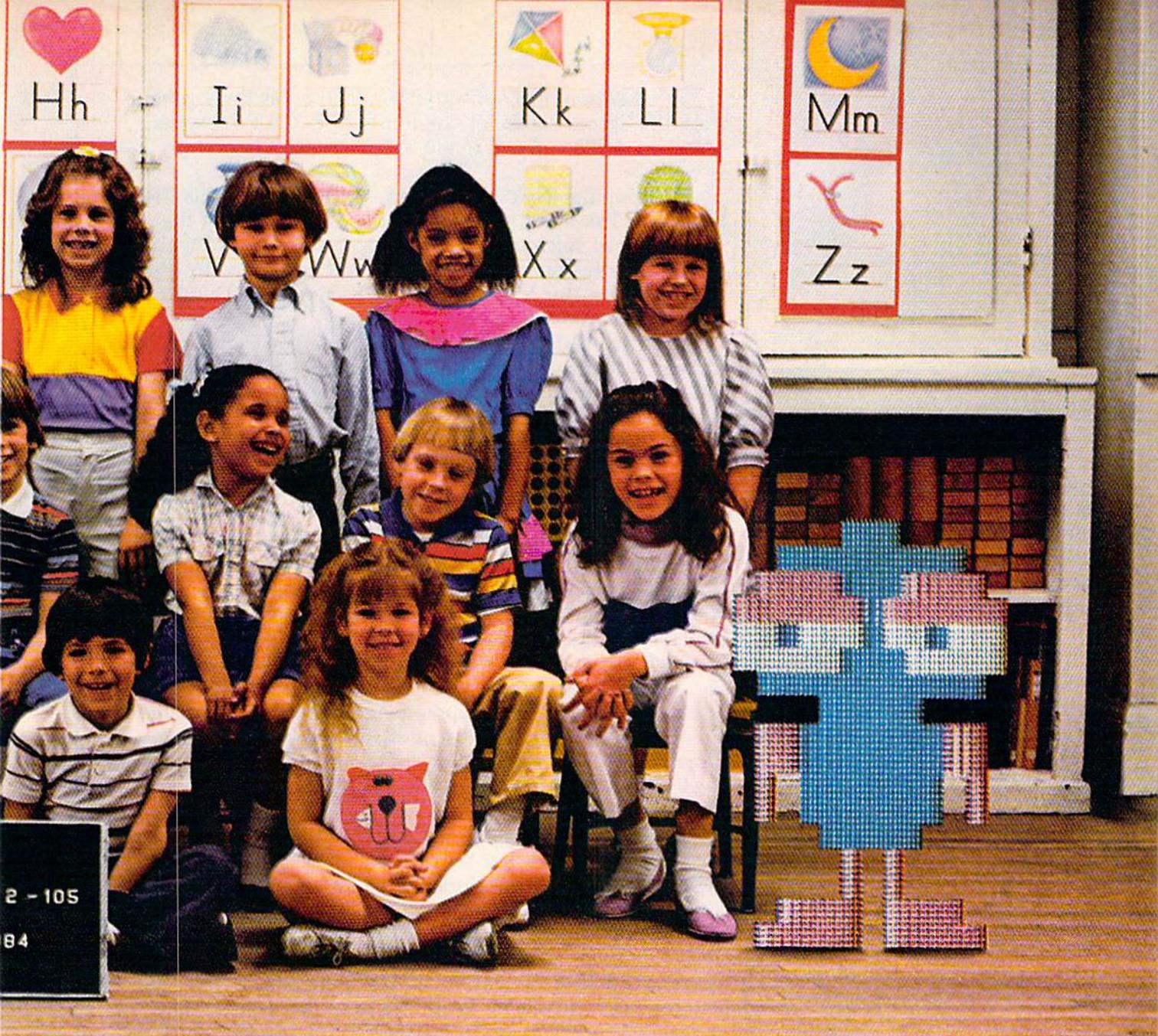
Your kid's new teachers are called Tink and Tonk. They come from Sprout. Software for kids 4 to 8.

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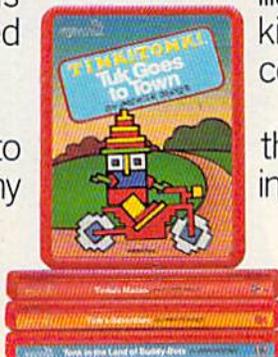
d a new breed of teachers.

variations and many decisions to make.

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rience of Mercer Mayer, who has written or illustrated 80 children's books. He dazzles kids with ideas and pictures that keep them coming back for more.

With TINK!TONK!™ software, kids see that learning can be more fun than destroying space creatures.

sprout

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HomePak, a three-in-one utility program from Batteries Included, offers *HomeText*, a word processor, *HomeFind*, a data base, and *HomeTerm*, a terminal program also designed for use with the major information networks. *HomePak* comes on a single disk and sells for \$49.95. Also new from Batteries Included is *Stress Manager*, a bio-feedback monitoring system, which includes software, an interface between the user and the computer, and an audio cassette. The software analyzes fluctuations in the skin's electrical conductivity and displays graphs which can then be interpreted by the user. It sells for \$79.95.

Another new three-in-one integrated package is *TRIO* from Softsync. This disk-based program includes a word processor, data base, and spreadsheet, and sells for \$69.95.

Professional Software launched their Soft Fleet series designed just for the 64. It includes *Fleet Writer*, *Fleet Speller*, and *Fleet Filer*. Prices will be announced.

An interesting product from HesWare is *Graphics Basic*, a utility which extends BASIC with 48 commands. It can be used to design business graphs or games, and includes the capability for split screens and windows. The price is \$29.95.

Continental Software's new Get Rich! Series is a set of five programs—*Strategies*, *Real Estate Planning*, *Insurance Planning*, and *Retirement Planning*—each

In its educational software, Mindscape has three product lines: the Sprout series for children 4 to 8, the Pixelwerks series for children 8 to 12, and a teen-to-adult line of products as well.

The popular Tink!Tonk! series—with Tink and his friends Tinka and Tuk and his dog, Tinkypup—are a part of the Sprout line of software. They were written by award-winning author and illustrator Mercer Meyer and developed by Angelsoft, Inc., for Mindscape. (Mindscape, 3444 Dundee Road, Northbrook, IL 60062.)

Prentice-Hall (Arrakis Advantage)—The Canadian-based Arrakis Systems, Inc., has developed a line of high-quality educational curriculum-based home software which will be distributed by Prentice-Hall.

The first 18 modules in their line of Commodore 64 software include algebra, biology, chemistry, geometry, physics, and statistics. Eventually, a complete curriculum will be developed by Arrakis. (Prentice-Hall, Inc., Rt. 9W, Englewood Cliffs, NJ 07632.)

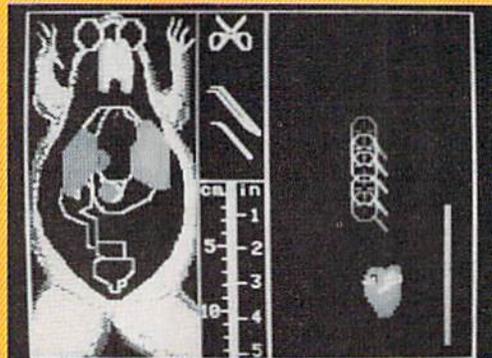
Scarborough Systems, Inc.—This well-known Tarrytown, NY-based company has concentrated on producing a limited line of high quality software, from which several programs are available for the Commodore 64.

Included are *Songwriter*, a music education program for ages five to adult; *Patternmaker*, an art construction set for ages six to adult (available in September); *MasterType*, a popular typing tutorial for ages six to adult; and *Laser Shapes*, a math game using laser beams, color, and sound, for ages 7 to 15 (available in September). (Scarborough Systems, Inc., Tarrytown, NY 10591.)

Scholastic Software—A division of Scholastic, Inc., a major educational publisher for over 65 years, Scholastic Software has developed a line of "fun-learning" game-oriented educational packages.

Among its new products at CES, Scholastic introduced *Operation: Frog*, an interactive computer simulation of a frog dissection, which was developed by Interactive Picture Systems. It will be available for the 64 later this fall.

Scholastic also announced at CES that its geography action game for children nine years and up, *Agent USA*, developed by educational software designer Tom Snyder, has been made available for the 64. And the reading adventures program, *Tales of Discovery* (for children 9 to 13), will be available for the 64 in early 1985. (Scholastic, Inc., 730 Broadway, New York, NY 10003.)



A computer simulation of a frog dissection is part of the focus of *Operation: Frog* by Scholastic Software, an entertaining introduction to biology.

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selling for \$49.95.

Cymbal, a Canadian software company new to the U.S., introduced two new series for the 64: the Productivity Series (*Tutor Plus*, a typing tutor which offers practice on 50 different business letters, *Data Plus*, a data base, *Calc Plus*, a spreadsheet, and *The Organizer*, a finance and scheduling program integrated with *Calc Plus*); and the Business Series (*General Ledger*, *Accounts Receivable*, *Accounts Payable*, *Inventory Control*, and *Invoice Writer*). Programs in the Productivity Series sell for \$39.95 each except for *Calc Plus* (\$49.95). Programs from the Business Series are \$49.95 each.

Commodore 1541 owners will be interested in *Kwik-Load!* from Datamost. It reprograms the Disk Operating System (DOS) for 300% faster loads and copies, and offers a variety of disk editing features. It retails for \$19.95.

There were enough new games announced at CES to cater to nearly every taste—so many, in fact, that space limits even a mention of all of them. Several companies introduced full lines of new arcade software for the 64. Parker Brothers and Sega introduced several translations of popular video arcade games. Brøderbund, Sierra, Epyx, Datasoft, Creative Software, Quicksilva, Datamost, Tri-Micro, and newcomer K-Tel introduced a variety of arcade-

Sunburst Communications, Inc.—"Bright ideas for learning" is the slogan of this New York State-based company which began 12 years ago as a filmstrip publisher and direct mail marketer.

Since entering the educational software field, Sunburst has won awards for its software, and several titles were announced for the 64 at CES. Included were *The Factory* (ages nine to adult), a problem-solving and planning game set in a factory; *The Pond* (ages seven to adult), an experimentation and pattern recognition game; *M-ss-ng L-nks* (ages nine to adult), a reading-writing-spelling game; and *Challenge Math* (ages seven to eleven), a program to help average and slow learners with math facts. (Sunburst Communications, Inc., Pleasantville, NY 10570.)

While space does not permit a listing of all the companies which featured educational software for the Commodore 64, the following companies all had significant products in this area. Many of these companies and their products will be featured in upcoming issues of the GAZETTE. Further information is available directly from the companies:

Alpha Software (Encino, CA), Batteries Included (Costa Mesa, CA), Brøderbund (San Rafael, CA), CBS Software (Greenwich, CT), Commodore Software (West Chester, PA), Creative Software (Sunnyvale, CA), Cymbal Software (Butler, NJ), DesignWare (San Francisco, CA), Discovery Educational Software (Buffalo, NY), First Star Software (New York, NY), Fisher-Price (Cambridge, MA), Futurehouse (Chapel Hill, NC).

Also, Human Engineered Software (Brisbane, CA), Joyce Hakansson Associates (Berkeley, CA), Krell Software Corporation (Stony Brook, NY), Microlab (Highland Park, IL), Random House Software (New York, NY), Screenplay (Chapel Hill, NC), Sierra (Coarsegold, CA), Simon & Schuster Electronic Publishing Group (New York, NY), Springboard Software (Minneapolis, MN), Timeworks (Deerfield, IL), Weekly Reader [Xerox] (Middletown, CT).

style and action/strategy games. Activision, another newcomer to the 64 market, launched six new titles.

Trivia buffs will be interested in several new games, each somewhat different from the others. Screenplay's *The Trivia Arcade* combines fast action, music, and trivia questions. It's for one to four players and sells for \$34.95. For \$29.95, you can purchase *Question Pack I* to add thousands of new questions. *Trivia Mania* from Professional Software is more straightforward and can accom-

modate up to eight players. The game also offers a handicapping feature so novices can play with experts. Price is \$39.95. Cymbal is offering a whole series—*World Facts*, *Sports*, *Entertainment*, *General*, and *Children's Trivia*—each for \$19.95; and for \$29.95, *Master Trivia*, which can be used alone or with the previously mentioned specialty games. If you'd rather have a little of each of these categories, there's *Entertainment Tonight* priced at \$32.95. Each of these games can be played by up to six players.

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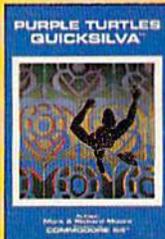
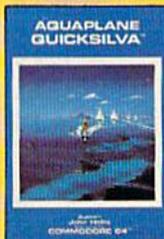
ULTISYNTH

PURPLE TURTLES

ANT ATTACK

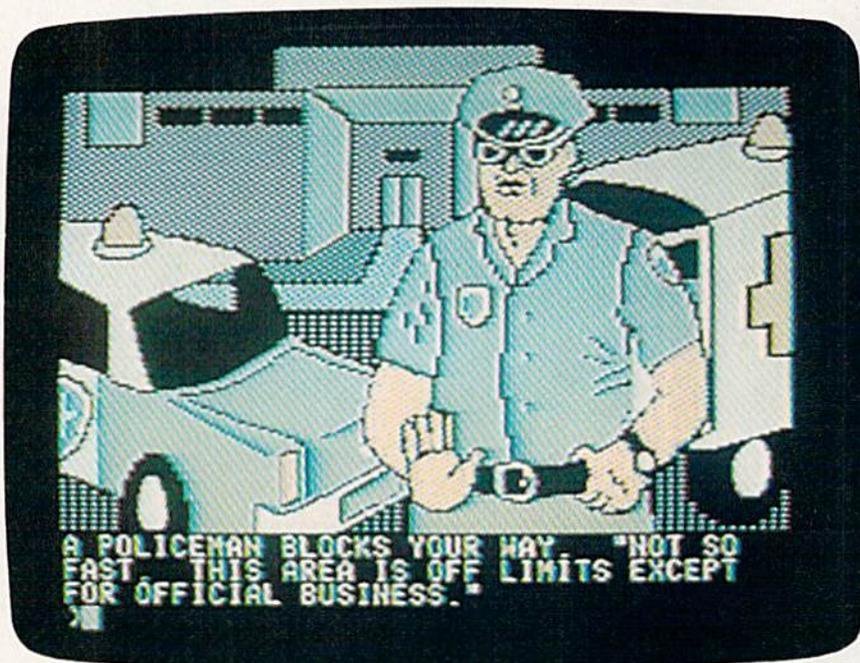
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Text and graphics combine with an exciting adventure scenario in Amazon from the new Trillium series.

The most innovative new "game" concept at CES belongs, perhaps, to Spinnaker's new software divisions, Trillium and Windham Classics. Both of these new product lines are billed as a series of interactive adventures. They're graphics/text adventures, but more than that. Trillium has worked closely with some of the most renowned science fiction authors (Arthur C. Clarke, Ray Bradbury, and Michael Crichton to name a few) to create software versions of their novels. The player enters the scenario of the novel as the protagonist and interacts with the characters and environment. Available titles are *Fahrenheit 451*, *Rendezvous With Rama*, *Dragonworld*, *Amazon*, and *Shadowkeep*. Each package costs \$39.95 and includes game background, a

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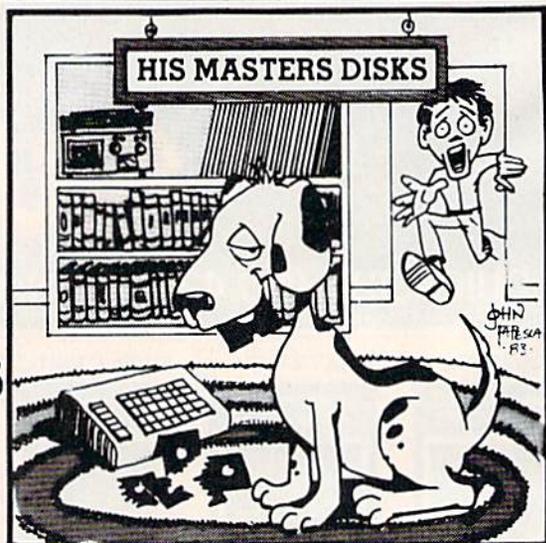
*UNGUARD Now allows you to read, write and verify bad sectors and errors on your disk making it easy to back-up most protected software.

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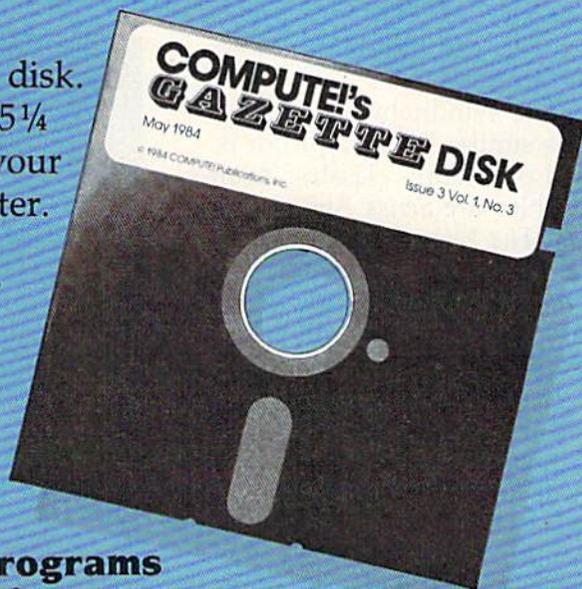
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"Should've made a back-up with the Clone Machine."

COMPUTE!'s GAZETTE DISK

COMPUTE!'s GAZETTE is now available on disk. Each month you can receive a fully tested 5¼ inch floppy disk which will run on either your Commodore 64 or VIC-20 personal computer. Each issue of COMPUTE!'s GAZETTE DISK will contain all the programs which appear in the corresponding issue of COMPUTE!'s GAZETTE magazine. You'll save hours of typing time and gain hours of enjoyment with all the quality programs found each month in COMPUTE!'s GAZETTE.



Here are just a few of the quality programs which appeared in the August 1984 issue:

- *Campaign Manager*—A two-player national election simulation written entirely in machine language. Decisions on traveling, campaigning, fundraising, TV appearances, and more determine if your candidate makes it all the way to the White House. For the 64.
- *Disk Purge*—Get rid of unwanted files or recover deleted files with this utility for the VIC and 64.
- *Sprite Magic*—A feature-packed sprite editor for the 64 that takes the tedium out of sprite design.

Written in machine language.

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word list, and hint book. More titles are planned.

The Windham Classics Series is similar in concept but is based on literary classics. Available titles are *Swiss Family Robinson*, *The Wizard of Oz*, *Gulliver's Travels*, and *Treasure Island*. Designed for ages 10 to adult, each program will sell in the \$30 to \$40 range.

In the same vein is Infocom's new *Seastalker*, an interactive adventure in the tradition of Jules Verne's *20,000 Leagues Under The Sea*, designed for children 9 and up. But the complexity will appeal to adults, too. It's available for \$39.95.

Another interactive adventure series called Time Travelers was introduced by Imagic. *The Time Machine*, based on H.G. Wells' novel, and *Another Bow*, where the player assumes the role of Sherlock Holmes, are scheduled for release in the Fall. Price is not yet determined.

Archon fans will be delighted by the sequel, *Archon II: ADEPT*. Written for Electronic Arts by the Free Fall Associates, authors of the original best-seller, *ADEPT* picks up where *Archon* left off. It's priced at \$40.

Access Software's follow-up to *Beachhead* is *Raid Over Moscow*, a multi-scenario action/strategy game where the player must race against the clock to prevent a nuclear holocaust by flying into Russia and dismantling missile launch sites. It's \$39.95.

Three new titles from Avalon Hill are *Market Forces*, a world economics strategy game for one to four players (\$16 for tape, \$21 for disk), *Ripper!*, a



The full-color Okimate 10, a price breakthrough in printers.

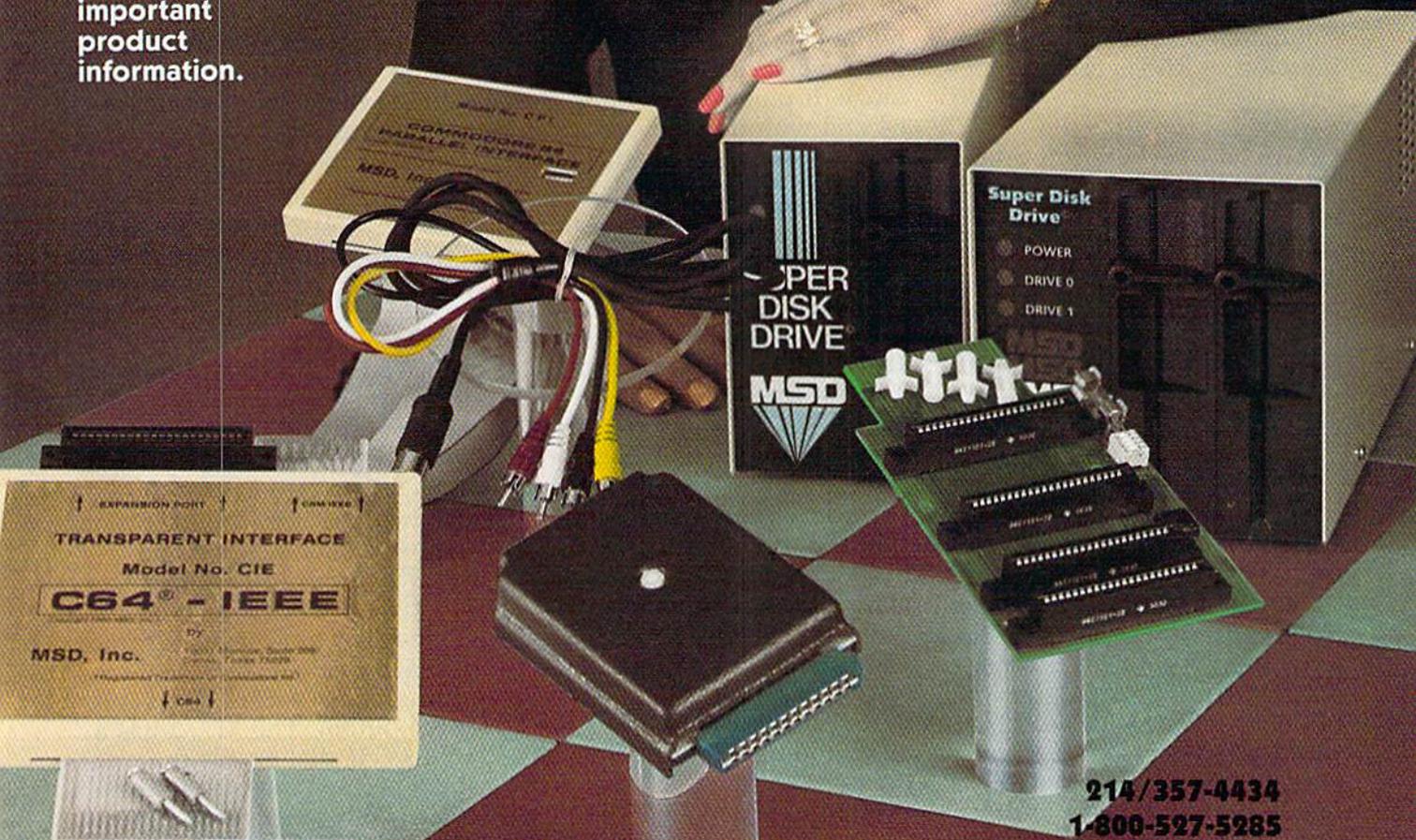
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Bright colors and precise resolution are displayed in this printout from the Okimate 10.

mystery adventure based on Jack the Ripper (\$25, disk only), and *Panzers East!*, a historical simulation of the 1941 German invasion of Russia (\$25 for tape, \$30 for disk).

Two new keyboards for the 64 were introduced at CES, and both appear to be exceptional values for the price. The Incredible Musical Keyboard from Sight & Sound overlays the 64's keyboard and is controlled by menu-driven disk-based software. Musical note stickers for each of the keys are included for beginners, as well as a song book and chord book. The keyboard is priced at \$39.95. A variety of music software, which can be used with or without the keyboard, is available also. The most impressive of these is the Kawasaki Synthesizer, a double-disk program. This program combines music with beautiful animated graphics. The screen interacts with the music, which can be both enhancing and distracting. The Kawasaki Synthesizer offers 99 preset sounds and a lot of good music with

one-key commands. It's \$49.95.

The Melodian Keyboard (from Melodian) looks like a portable organ. The 18-inch, 37-key keyboard has a three-octave range. It plugs directly into the 64 and with the appropriate software produces sounds ranging from strings, brass, and woodwinds to synthesizers. Notes are displayed on the screen as they are played. Aimed at the home and school markets, Melodian supports the keyboard with three menu-based software packages, *MelodyMaster*, *RhythmMaster*, and *ConcertMaster*. The latter is included when you purchase the keyboard. The price is \$200.

The most exciting new hardware entry for the 64 at CES had to be Okidata's new dot-matrix color printer, the Okimate 10. It prints text or color graphics at 60 cps, has four character sizes, isn't fussy about the paper it prints on (thermal or plain), and has true lowercase descenders. The Okimate 10 uses a thermal transfer process in which the printhead (a silicon chip with a

small heating element embedded) moves across the page, comes in contact with the ribbon, and melts the ink coating off the ribbon onto the paper. It comes with a color and black ribbon cartridge, paper, a connector cable, a Plug 'n Print module (the interface), a manual, and software (designed primarily for those using a printer for the first time). What's even more eye-catching is the price: \$239.

Another price breakthrough is Cardco's new monitor tuner, which converts a composite monitor (such as Commodore's 1701/1702) into a TV. Cardco has two versions, the MT/1 and the MT/2, for \$199.95 and \$99.95, respectively. The MT/1 is a remote control, 60-channel cable ready tuner which features a digital readout for precise tuning and separate audio and video output. The MT/2 has a UHF/VHF dial on the front of the tuner and a cable/antenna input. Both tuners have computer/TV switches and can be used with color or monochrome monitors.

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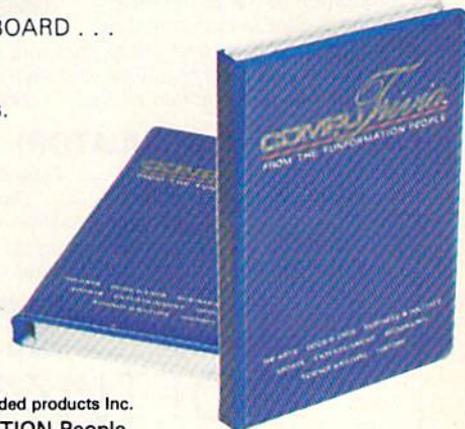
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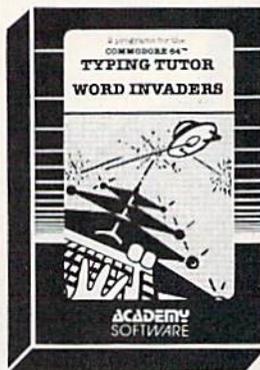
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With new products continuing to support the 64, it's hard to imagine a machine this popular becoming obsolete. Yet because the industry is so new and has gone through some drastic changes, it's easy to wonder about the future of the 64. Eventually, it will follow the VIC out the back door. A hint of what's to come was in the wind at CES.

Sinclair's new 16/32-bit computer, the QL, uses a 68008 microprocessor (virtually the same chip as found in Apple's Macintosh) and offers 128K RAM expandable to 640K. It comes with a built-in word processor, spreadsheet, data base manager, and graphics package, two built-in 100K "microdrives," (high speed endless-loop tape drives) and two RS-232C interfaces. Its 32K ROM operating system allows for multi-tasking—the ability to run several programs individually and simultaneously. The QL ("Quantum Leap") weighs three pounds and will be available this Fall for \$499, mail order only. The question of software support for this powerful, new machine from England remains, but it clearly demonstrates what kind of power the next generation of computers will offer at a reasonable price.

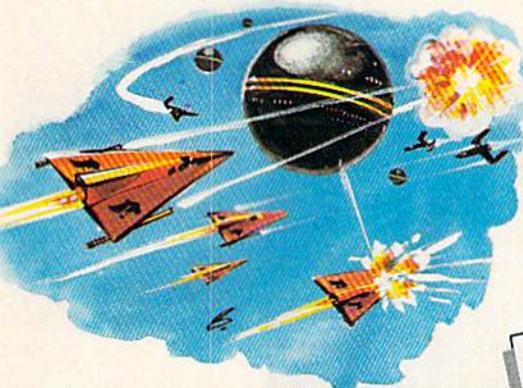
On the other side of the globe, in Japan, another kind of computer is gaining fast—those conforming to the MSX standard. MSX is an internal hardware architecture standard developed by Microsoft, and Japanese/ Korean computers adopting it will probably hit the U.S. market sometime in 1985. The potential marketing strength of the MSX, built around the eight-bit Z-80 processor, is that companies can license the architecture, house it in their own keyboard, and thus create a computer which is hardware- and software-compatible with any other MSX computer. Any software written for, say, a Panasonic MSX computer runs fine on a JVC or Spectra-video MSX machine. If Microsoft is successful in establishing the MSX as an industry standard, we could see a massive wave of change in the home computer market. But, for now, enjoy the feast. ☺

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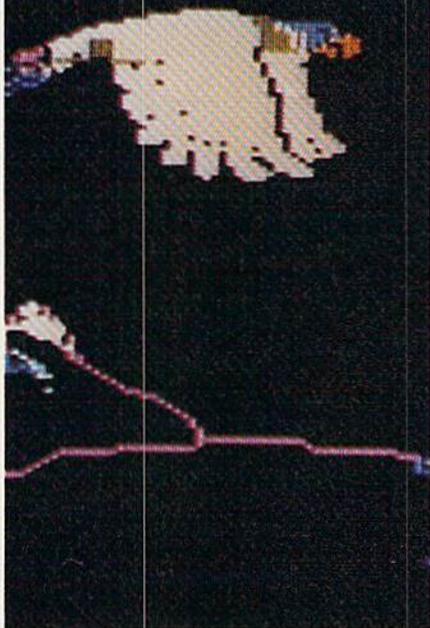
The Designers Behind *MovieMaker*

Kathy Yakal, Editorial Assistant



Guy Nouri and Eric Podeitz (second and third from left, second row back) and other staff members of Interactive Picture Systems.

Electronic construction sets—programs which allow non-programmers to design games or programs—are finding their niche in the software market. Bill Budge pioneered this new genre with *Pinball Construction Set*. Now there's *MovieMaker*, recently released by Reston Publishing for the Commodore 64, which turns your computer into an animation studio.



Coming in for a landing: these three frames are part of an animated sequence created with MovieMaker.

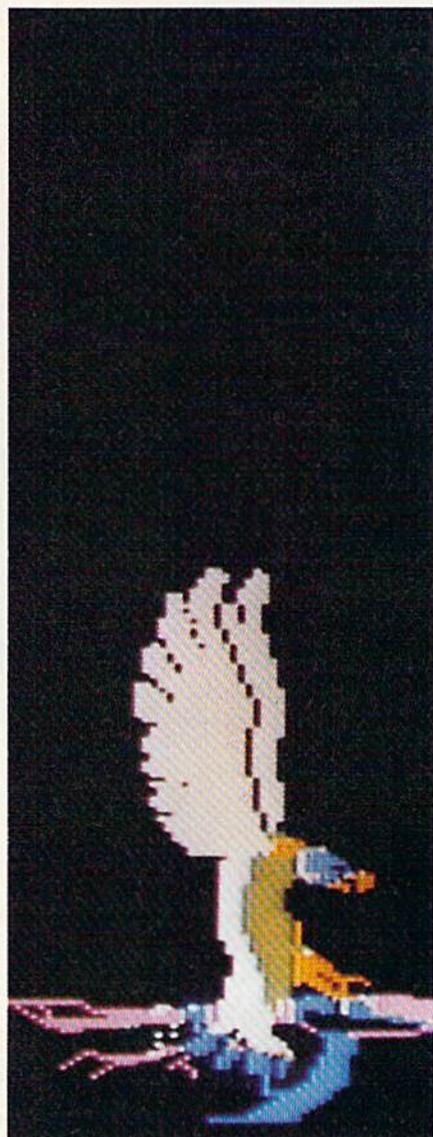
About the time that the early filmmakers were struggling to combine sound and moving pictures, a young man named Walt Disney—using techniques that had been discovered in the mid-nineteenth century—began producing animated cartoons. Free of the restrictions of reality that bound and frustrated motion picture makers, Disney sought to create his own imaginary characters and worlds.

Creating cartoons in those days was slow, painstaking work. It involved drawing many, many versions of a particular scene, each just a fraction of a second later in the action, then “flipping” them very rapidly to offer the illusion of motion.

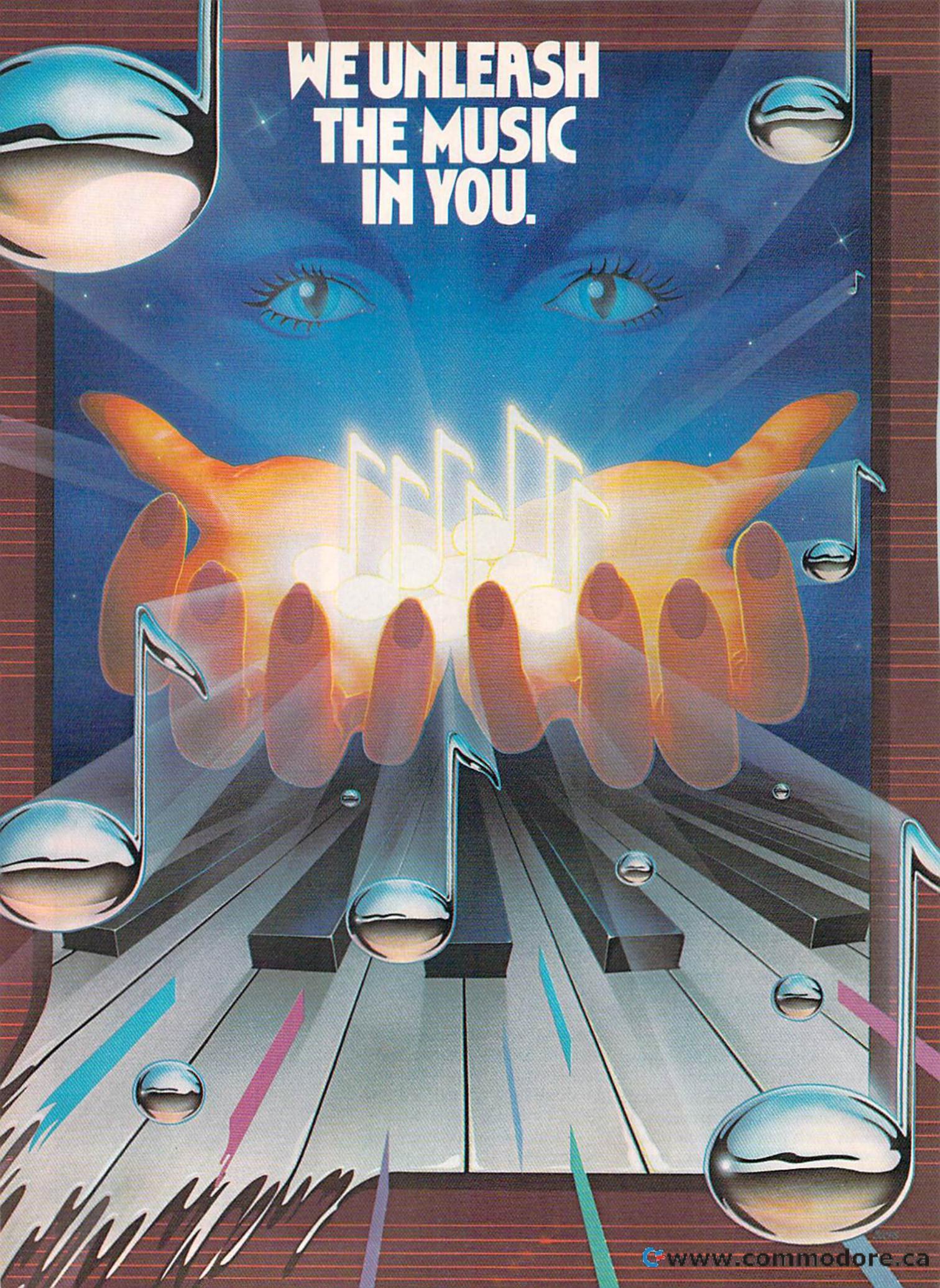
What used to take pro-

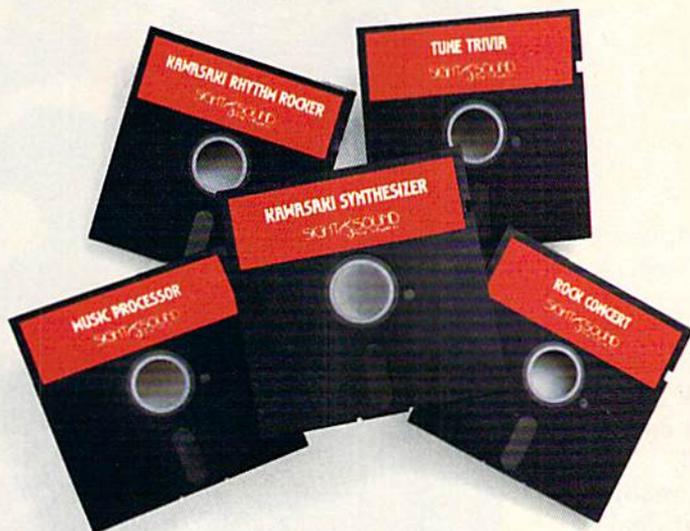
fessional animators weeks, even months to do—create a short, animated sequence—can now be done by a novice in a few days, by using *MovieMaker*.

This package cannot truly be regarded as a traditional videogame. Guy Nouri, president and co-founder of Interactive Picture Systems, says it was



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written for artists and animators, people who need to make graphics move.

At that, it's been successful. Local 841 of the Screen Cartoonists Union in New York City tested it for six months and gave it their seal of approval.

But it's also been recognized as having a great deal of appeal for the artistic community. It's been exhibited at a number of museums, including the Beaubourg in Paris, the Exploratorium in San Francisco, and the Corcoran Art Gallery in Washington, D.C. Several East Coast educational institutions have incorporated it into parts of curricula or special projects. Other software designers are using it to design superior animation in their programs.

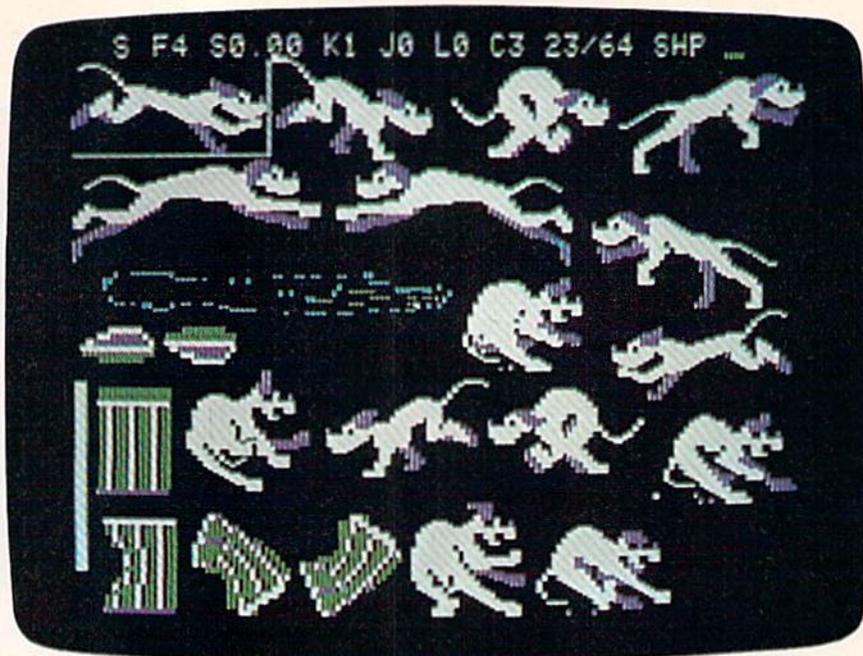
But perhaps most important to Nouri, it's for those "who want to create their own stories, their own computer movies."

Interested? You'll need to spend about a week with *MovieMaker* to grasp all of its capabilities, but you can get started in five minutes, and create a short animated sequence in less than a day.

You'll go through all the steps that a real filmmaker or animator would go through in creating a short film, only you make all the decisions yourself.

By communicating with the program through the joystick and keyboard, you'll create your cast (either by selecting pre-defined people and animals, or drawing your own), draw in scenery and add color, and arrange your shapes into the sequence that will be your story.

Next, add sound, titles, and



You can create your own shapes for animated sequences in MovieMaker, or choose from pre-defined shapes, like this page of dogs.

any other special effects you want. Record the whole sequence. Now go back and edit your movie. And play it.

How many times have you sat through all of the credits at the end of a movie? Probably not many. Most of us brush the popcorn off our laps and head out, not particularly caring who the gaffer and best boy were.

Making a major motion picture these days can take hundreds of crew members, millions of dollars, and many months, even years.

But in their early days, movies didn't require more than a few people. One of the very first films made was a few seconds long and consisted of a man sneezing. The crew was the cameraman and the guy who sneezed.

Movies have evolved, but the microcomputer industry is still in its infancy. And most videogames of the last decade have been written by one person, sometimes involving input by a few others. But production

of tomorrow's videogames will involve a level of complexity close to that of film production, Guy Nouri believes. Hence, his company, Interactive Picture Systems.

Guy Nouri was born in Alpine, New Jersey. He attended a number of different schools, including St. Paul's School and Princeton University, studying fine arts, art history, film, photography, and computer graphics.

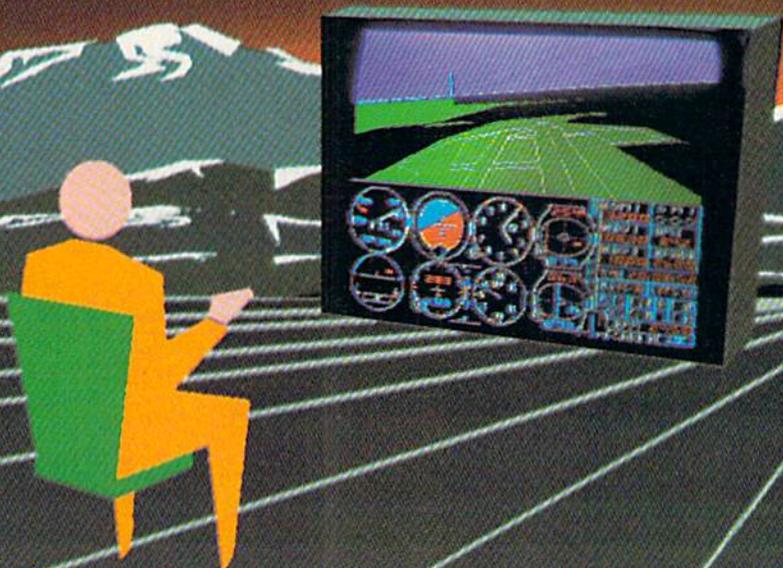
After two years at Princeton, Guy walked into his advisor's office for some class scheduling. He recalls: "My advisor looked at my records and said, 'You've already completed all your fine arts requirements, but you haven't taken any French or history or anything like that.'

"That's right," Nouri replied. So he packed up and left.

Nouri spent the next few years on the West Coast, working as an electrician to support himself while he continued painting and sculpting. His interest in microcomputers, piqued partly by what he saw going on at Xerox PARC (Palo Alto

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Research Center) in the early 70s, led him to start a magazine, *Computer Pictures*, in 1980.

It was about that time that Nouri met Eric Podietz, who had been programming computers since he was a teenager at the University of Pennsylvania. Podietz had formed his own graphics software company and created a package called *Painter Power*.

The two joined forces on a graphics program called *Paint* (originally programmed on a mini-computer by Dick Shoup) for the Capitol Children's Museum in Washington, D.C. The program was a hit, and a partnership was born: Interactive Picture Systems incorporated in 1982, and Nouri and Podietz moved on to their next project.

"We had done *Paint*. The next step was to make it move, to animate it," says Nouri.

IPS approached a publisher with their idea, and were politely told that was impossible. "You could barely get a paint program," they were told.

"Trust us," they replied.

"OK, show us some samples," the publisher countered.

So Nouri and Podietz showed them three animated frames.

"Keep trying," said the publisher.

Two months later, IPS had a ten-frame animated sequence that would continue to loop without bombing.

And they had a contract.

MovieMaker took five people two years to complete. The original cost estimate was \$60,000, but the final expense went over \$200,000. "It was a labor of love," says Nouri.

The roles of a movie crew are pretty well defined, and familiar to anyone who watches movies. You've got actors, directors, producers, writers, editors, and a number of other technical and creative roles.

Software design groups are not yet so compartmentalized. At Interactive Picture Systems, though, roles are evolving.

There were basically five people involved in the design and production of *MovieMaker*: Guy Nouri, Eric Podietz, Jimmy Snyder, Mark Scott, and Bob Svihovec.

In creating *MovieMaker* Nouri and Podietz were responsible for the overall project, as well as many of the intricate details. Nouri describes Podietz as the partner that sees things on the inside, and himself as the one who sees them on the outside.

This means Podietz concerns himself more with the actual task of programming. "Eric builds the program from the inside out," says Nouri. "He decides what has to be done to set up the program, how the code has to be set up, where these newfangled data structures will go."

Nouri, on the other hand, must constantly assess what he calls the *psychological interface*. "I look at things like user experiences and the marketplace," he says. "That means looking at how someone feels as they approach the software, what their expectations are, what they want to do, how they want to feel while they're doing it. There's also a lot of care taken to the subject matter itself."

Nouri and Podietz commu-

nicate in a kind of "meta-language," one which can best be described as a way of talking about states. What state is the program in? What state is the user in? You have to link those up. "An awful lot of attention and time is given to getting the dialogue between the program and player right," says Nouri.

So how does this partnership work, with its varying areas of emphasis and its unique form of communication? "We argue all the way down the line," Nouri chuckles.

"Software engineers" Jimmy Snyder and Mark Scott were also key to the development of *MovieMaker*. "Jimmy is what we call a black box maker," says Nouri. "He can write these outrageous little algorithms, these routines that make things just zip across the screen."

Mark's imagination and programming skills were a major contributing factor to the user-friendliness of the program. And Bob Svihovec, now art director at IPS, did the animation.

Over the last two years, IPS has grown to a staff of 20 software engineers, graphic artists, and various support people. Their business office is a couple of rooms on Park Avenue in New York City, and their creative work is done in seven rooms on four floors of a brownstone in Philadelphia.

Nouri believes strongly in treating each of those 20 staff members as unique, creative individuals. The result, he says, is a commitment from those people unattainable in any other way.

That commitment has contributed to the development of a

prolific crew of software designers. Besides *Paint* and *MovieMaker* (published by Res-ton Publishing), IPS has done an aerobics simulation for Spin-naker Software, and *Operation Frog*, a simulation of a frog dissection for Scholastic. They've recently signed a contract with Electronic Arts for a game that is "...more fun than a comic book," according to Nouri.

"Publishers are starting to come to us and ask us what we want to do," which Nouri believes is the way it should be. "I think what we're going to see is a lot of banding together of artists over the next few years," he says.

Nouri likens the major software developers over the next few years to professional sports teams. "I think it's a lot more like that than book authors or rock and roll stars," he says.

"There may be a few stars. And there will probably be a kind of major league, a dozen or so famous teams of software designers," he says. "I also don't think there will be more than a dozen or so software publishing houses, probably grouped by personality of the software, like business or entertainment."

If Nouri wants to be the Babe Ruth of the software league, it's not obvious. He's humble. He's eager to listen to

the ideas of others. He continues to hone his own artistic skills, and broaden his understanding of how humans can effectively communicate with computers, and with other people through computers.

And he's quick to share the credit for IPS' success with all the other members of the team, and to praise the important contribution of sensitive publishers. "Publishers would do well not to treat software development like manufacturing, because it ain't," he says. "It involves talent, and it involves creative, temperamental, sensitive people. There's a real balance to maintain." @

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80 Columns For The 64

Gregg Peele, Assistant Programming Supervisor,
And Kevin Martin, Editorial Programmer

Did you ever wish for an 80-column screen? "Screen-80" transforms your 64 into an 80-column machine without affecting the normal screen editing keys. We've also included "Custom-80," which allows you to create your own 80-column character set with a joystick.

"Screen-80" offers a full 80-column screen and provides you the ability to use your 64 to write, edit, and even run BASIC programs (including some commercial software). You can also use all the cursor controls of the normal screen editor. It runs concurrently with the normal system, allowing a quick switch between 40- and 80-column modes.

Best of all, little memory is used by Screen-80. The program consists of approximately 3K of machine language which goes into RAM "underneath" ROM. There are also 43 bytes which are placed in a little used area of RAM (locations 710-753). Since the bulk of Screen-80 uses the same memory locations as the operating system, and the location of the 43 bytes used from RAM are normally unused anyway, Screen-80 works without any apparent loss of programming space.

Using 80 Columns

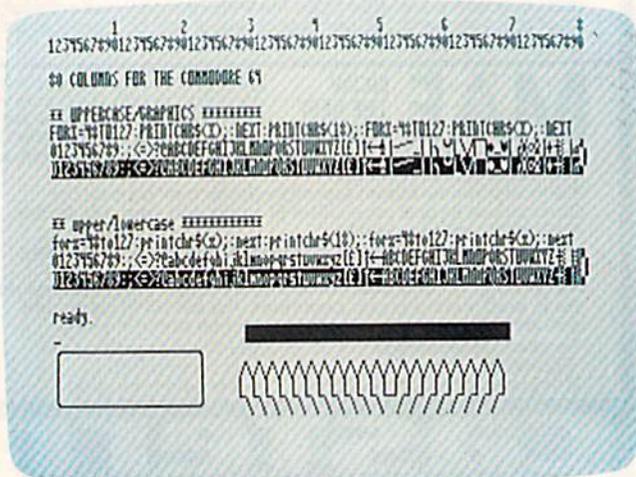
Once you enter 80-column mode, the first thing you're likely to notice is the smaller size characters. Since increasing the size of the screen is impossible, adding 40 more columns to the 64 makes it necessary to halve the size of each character. Some televisions may not produce a clear enough picture to make these smaller characters readable, so you may find it difficult to read text in 80 columns. We recommend using a video monitor with the color turned off. You may want to change the character set to suit your personal taste or needs. "Custom-80" (discussed later) is designed to let you do just that.

Screen-80 provides a different cursor than does the normal 40-column mode. Rather than a blinking block, it uses an underline character; but like the normal cursor, it can move anywhere on the screen. In fact, you can use all the cursor

control keys, just as you would normally, to insert or delete, home the cursor, clear the screen, or create BASIC program lines.

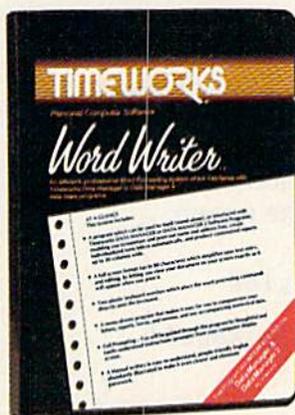
Both uppercase/graphics and lower/uppercase modes are supported in Screen-80, but you cannot toggle between these modes with the SHIFT-Commodore key combination. Instead, you can put the screen editor in lower-/uppercase mode by pressing the CTRL and N keys simultaneously, or by printing CHR\$(14). To return to uppercase/graphics mode, simply print CHR\$(142) to the screen. These methods affect only characters printed after these commands. Thus, you may have both sets (for example, graphics and lowercase) on the screen at the same time for increased programming flexibility.

You can change the color of the background, text, or border by simply POKEing the appropriate color number into location 53281 (for the background), location 646 (for text), or location 53280 (for the border). Changing text color changes the color of all text on the screen. If you want to change the background or text color during program mode, print a CHR\$(13) after POKEing the appropriate location. Since color memory is fixed on the 64, it's impossible to have true 80-column color. Therefore, Screen-80 does not recognize color codes in PRINT state-



Graphics, upper- and lowercase can be displayed simultaneously with Screen-80.

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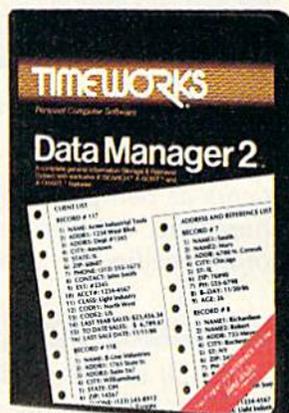
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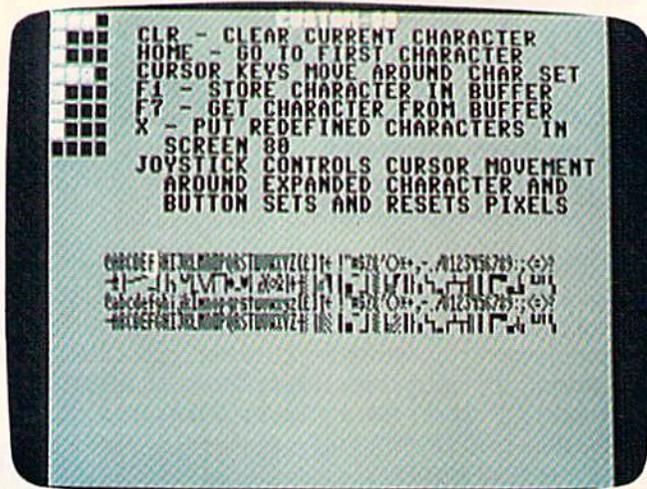
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Redefining characters is easy with Custom-80.

ments as being any different from other graphics characters. All printing to the screen uses the color specified in location 646.

Graphics And Sound Routines

Screen-80 can be used with sprites, high-resolution graphics, and sound—just like the normal 64 screen. Since this program actually uses a hi-res screen, you can also use it for other graphics displays. You can even have text and hi-res graphics on the screen at the same time. (Check your *Programmer's Reference Guide* for more detailed information on how to plot points on the hi-res screen.)

To plot points (or do anything else) to the hi-res screen, it is important to know how to POKE and PEEK to the screen. The hi-res screen for Screen-80 is located at 57344 (\$E000). Since this screen memory shares addresses with ROM, you may POKE graphics safely to the screen, but attempting to PEEK from the screen will give you values from the ROMs. To PEEK these screen locations, you must first disable interrupts, then use location 1 to reconfigure the 64. Location 1 allows you to selectively replace ROM locations with RAM—making it possible to have a full 64K of RAM on the 64. Once you reconfigure the 64, you can PEEK locations on the screen. Since the operating system must access the ROMs to function properly, you must immediately restore the 64 to its normal configuration and re-enable interrupts. Here's an example of how to do it in BASIC:

```
10 POKE 56334,PEEK(56334)AND254:REM DISAB
LE INTERRUPTS
20 POKE 1,53:REM RECONFIGURE 64
30 PRINT PEEK(57344): REM PEEK THE FIRST
{SPACE}BYTE OF SCREEN RAM
40 POKE 1,55:REM RETURN 64 TO NORMAL
```

```
50 POKE 56334,PEEK(56334)OR1:REM REENABLE
INTERRUPTS
```

Using sprites in Screen-80 requires all sprite data to be kept within the same 16K block as the hi-res screen. Locations 49152 (\$C000) to 53247 (\$CFFF) are perfect places to put sprite data. The sprite pointers for Screen-80 are located at 53248+2040 to 53248+2047. To cause sprite 0 to get its data from 49152 (\$C000), put a zero into location 53248+2040. Since POKES to this area of memory are normally intercepted by the I/O chip, we must disable interrupts and I/O to put a value into these locations. Here's a program to put a sprite onto the screen:

```
10 V = 53248
20 POKE V,100:POKE V+1,100
30 POKE V+39,2
40 POKE 56334,PEEK(56334)AND254
50 POKE 1,PEEK(1)AND251
60 POKE 53248+2040,0
70 POKE 1,PEEK(1)OR4
80 POKE 56334,PEEK(56334)OR1
90 POKE V+21,1
```

Creating sound from within Screen-80 is done exactly the same way as from the normal screen. In fact, since you want to POKE the information to the SID chip (in the I/O area), you don't have to disable interrupts or do any bank switching, as was necessary for hi-res graphics or sprites. The normal POKES will do.

Using Other Programs With Screen-80

This program is designed to intercept any calls to the normal Kernal PRINT routine (\$FFD2). Software which bypasses this routine or POKES directly to the screen will not work correctly with Screen-80. An example of a program which bypasses the PRINT vector is the DOS wedge program (on the TEST/DEMO disk which comes with 1541 disk drives). Fortunately, this problem can easily be fixed by changing all PRINTs to pass through the standard vector. This program, when used in place of the normal DOS boot program ("C-64 Wedge"), changes these references.

```
10 IF A=0THENA=1:LOAD"DOS 5.1",8,1
20 FORI=1TO7 : READ A:POKEA,210: POKE A+1
,255:NEXT
30 DATA 52644,52650,52712,52726,52752,527
65,53075
40 SYS 52224
```

With these changes, the DOS support program will work with Screen-80.

One of the best applications of Screen-80 is with terminal software. We tested Screen-80 with the terminal software that comes with the VICmodem and the 1650 Automodem by Commodore. Since both programs use the standard

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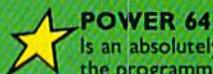


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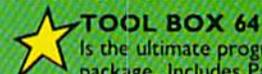
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PRINT vector, they work fine. Programs which depend on sprites should be avoided, as should programs which move screen memory or otherwise change the normal configuration of the 64.

SpeedScript does not use the PRINT vector at \$FFD2 to update the screen, which makes it incompatible with Screen-80.

How To Enter And Use Screen-80

Like most machine language programs in COMPUTE!'s GAZETTE, Screen-80 is listed in MLX format. That means you must first type in the MLX program and then use it to enter Screen-80. The newest version of MLX has a built-in numeric keypad to ease the burden of typing all those numbers (see the MLX article for details). Initially, Screen-80 resides in the same area as the beginning of BASIC. To protect MLX from being overwritten by Screen-80, we'll use a starting address of 49152 and an ending address of 52811. Once you've entered the program and saved it to tape or disk, turn your computer off and then on again.

Now LOAD the program from disk or tape using the normal format for LOADING BASIC programs:

```
LOAD "filename",8 (for disk)
LOAD "filename" (for tape)
```

Notice that we LOADED our program without the ,1 that generally accompanies ML programs. If the program loaded correctly, you can LIST it. You should see one line with a SYS command. Simply RUN the program and you'll have Screen-80. Pressing RUN/STOP-RESTORE will put you into 40-column mode, and typing SYS710 and pressing RETURN will bring back 80 columns. You can make a backup copy by simply saving it as you would a BASIC program:

```
SAVE "filename",8 (for disk)
SAVE "filename" (for tape)
```

At this point, type NEW to begin programming in 80 columns.

Custom-80: Creating Your Own Character Set

"Custom-80" (Program 2) allows you to create your own character set for use with Screen-80. It's easy to use and requires a joystick. Custom-80 "borrows" the character set from Screen-80 and then moves it to a safe location in memory for editing. After editing, you can return the custom characters to the Screen-80 program, or save your new character set to disk or tape. Like Screen-80, it's in MLX format. The starting address is 49152 and the ending address is

51240. To load Custom-80, type:

```
LOAD"CUSTOM-80",8,1 (for disk)
LOAD"CUSTOM-80",1,1 (for tape)
```

After loading it into memory, type NEW to reset the BASIC pointers. Next, LOAD Screen-80 into memory and SYS 49152. This puts you in Custom-80 and, at the same time, accesses the character set included with Screen-80.

The Screen-80 character set is displayed in the lower half of the screen, while the current character being edited is framed by a yellow cursor. In the upper-left corner of the screen the character is enlarged for editing, and brief instructions are provided to the right.

Customizing Characters

You can choose which character you want to edit by moving the cursor around the screen using the joystick or the cursor keys. The flashing blue square indicates the current pixel in the character you are editing. To set the pixel, press the fire button on the joystick. To reset the pixel, press the fire button again.

Press SHIFT and CLR/HOME to clear all the pixels in the character you're editing. (This will not affect the characters previously edited.) To home the cursor to the first character, press CLR/HOME without pressing SHIFT. To copy a character from one position to another, press f1 to store the current character into the buffer. Then move the cursor to the new position of the character and press f7 to retrieve it from the buffer.

Pressing S saves the character set to tape or disk as a short program file. It can then be loaded back into memory with the L command. When loading or saving, you will first be asked for the name of the file, then asked to press T for tape or D for Disk. If an error occurs during a

```
251 for j=0 to 27: poke $j,0: next: poke $j,27,15
252 for j=1 to 250: next
260 if i=0 then 272
263 i=3: print "Your solution is correct!": gosub 1210
269 print "Player 'q' has cracked the case!": goto 262
272 i=2: print "Do!... That was a false arrest!": gosub 1210
275 gosub 1200: p2(35+q)=0: p2(50)=p2(50)+1: print "You're out of the game!"
278 if p2(50)=9 then 275
281 restore: gosub 1213: for j=1 to 500: next: gosub 1213
287 print "All players have given incorrect solutions to the crime!"
292 print "Nobody wins!"
282 print "Here is the correct solution!": print "The '$9(q2(32))'
289 print "killed the '$9(q2(33))' in the '$9(Cabs(p2(3D)))'."
291 print "using the '$9(q2(33)+10)'." : read
300 print "### XXXX DDDP ## ITEN XXXX": gosub 1200
303 if i=0 then print "You weren't carrying anything!": goto 250
306 print "You drop ": gosub 1200: print ":": goto 250
320 print "### XXXX ITEN XXXX": j=1: print "These items are available:"
323 for i=1 to 31: if p2(i)=0 then 325
325 print j: ";": gosub 1200: print " ": poke 900,j,i: j=j+1
326 next: if i then print "to items.": goto 250
332 print "Enter number to take an item, or": print "enter zero to take nothing."
break
ready.
```

Programming in BASIC with 80 columns.

SpeedScript Customizer

J. Blake Lambert, Assistant Editor

When "SpeedScript" was first published, we didn't imagine how popular it would become with GAZETTE readers. One of the most frequently asked questions is how to change the default settings and formatting commands to suit individual preferences. This short program is the solution. It modifies SpeedScript with values you choose, creating a new version which can be saved to tape or disk. For the VIC (with at least 8K expansion) and the 64.

If you use either version of SpeedScript with a VIC or 64, tape or disk, this customizer program will be a real timesaver. It allows you to predefine background and character color, left, right, top, and bottom margins, page length, line spacing, and to select single sheet or fanfold (continuous pinfeed) paper. In addition, you can change or add values for the predefined formatting codes used for printing.

"SpeedScript Customizer" fixes the new page command in SpeedScript 1.0 (January) for the 64, and corrects an error in the predefined values of the version printed in *COMPUTE!'s Second Book of 64*.

In short, you can make your own personalized copies of SpeedScript with any values you choose. The Customizer doesn't improve SpeedScript; it lets you teach SpeedScript to do things your way (until it is otherwise notified). Once you've used SpeedScript enough to know what values you prefer, you're ready to use the Customizer.

For example, you may prefer to print documents single spaced with margins at 10 and 70, using single sheets of paper. You may also need to be able to send special codes to the printer to access all of its features, such as emphasized characters, underlining, special symbols, etc. SpeedScript allows you to assign formatting codes at the beginning of a document, but you have to define them every time you want to use them.

It's possible to set up format files and SAVE them if you like, but it's simpler to use the Customizer to SAVE your personalized version(s) of the program instead. The values can still be re-



SpeedScript Customizer allows you to set your own values for margins, spacing, paper style, and printer codes.

defined in the same way as before; we're just changing the default values, what SpeedScript thinks is "normal." It doesn't destroy the original, it just creates new, personalized copies. You could, for example, have one version of SpeedScript for writing business letters, one for personal letters, and another for writing reports.

How To Use SpeedScript Customizer

First type in Programs 1 and 2, and SAVE them. (Make sure to name Program 2 "CUST.SS" so that it will load properly.) Next, LOAD and RUN Program 1, the Customizer Boot. This automatically loads and runs Program 2. The Customizer will prompt you to insert the version of SpeedScript written for your computer, then ask for a filename. Enter the filename of the SpeedScript version on your tape or disk and press RETURN. Press d for disk or t for tape at the prompt, and as soon as it finishes loading, the Customizer will display which version it has found. (For example, VIC SpeedScript v1 means you're using a VIC and the SpeedScript published in the January 1984 issue.) This message is then followed by the color selection screen.

Not all monitors have perfect picture resolution, and many of us use a TV for a computer monitor. So, it's nice to be able to select the color



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of the background and characters, which SpeedScript allows with the CTRL-b and CTRL-l commands. But if you CLEAR ALL TEXT, the program returns to the default colors (the colors that were there when you first ran the program). The color selection screen in the Customizer allows you to flip through the background colors with the f1 key and through the character colors with the f3 key. Some people like to use a dark gray or black background with light green characters, to emulate a green screen monitor. When you find a combination that suits you, press RETURN.

Changing The Default Values

After you've set the letter and background colors, another menu appears. The program will ask you to enter a series of values for the default values. If you choose not to change a setting, simply press RETURN and the original default will remain unaltered. Here are a few tips on setting the values correctly:

- **Left margin:** Sets the default value for the [l] function (obtained by holding down the CTRL key and pressing the £ key, then pressing l) in SpeedScript. As on a typewriter, the left margin is the distance (number of spaces) from the left edge of the page before characters are printed. It should be at least 1. For a one inch margin with normal (pica, ten characters per inch) type, set this value to 10. With other print sizes, multiply the margin width you want (in inches) by the number of characters per inch.

- **Right margin:** Sets the default value for the [r] function. This is the preferred distance from the last character on a line to the right edge of the paper, subtracted from the number 80. You can also think of this as the left margin plus the number of characters per line you want to print. With 8½ inch wide paper and [l] set at 10, make [r] 70 for a one-inch right margin.

- **Page length:** This value has no corresponding function in SpeedScript. It is the number of lines that fit on a page, preset at 66, since standard paper is 11 inches long and most printers print six lines per inch. If you want to use personalized (nonstandard) stationery or legal-size paper, you would change the value accordingly (inches of length times six). Also, some printers or interfaces allow you to change the spacing between lines to print eight lines per inch on standard paper. Once you've set the printer into this mode (you may have to flip a switch on the interface or send a special code to the printer), change the page length value in SpeedScript to 88 (lines per inch times length of paper in inches). Remember to change the bottom margin, too.

- **Top margin:** Sets the default for [t]. This is the number of blank lines at the top of the page. Should be 5 or more.

- **Bottom margin:** Sets the [b] default. This is the page length minus the number of lines you would like at the bottom of the page. You can think of this as the top margin added to the number of lines you want to print. Should be 58 or less when using standard paper, and always at least 8 less than the page length.

- **Spacing:** SpeedScript's [s] function. Use a 1 for single spacing between lines of text, a 2 for double spacing, and so forth.

- **Paper style selection:** Works like the [w] command. Answer 0 and SpeedScript will wait for you to press RETURN after printing each page of text. Allows you to use single sheets of paper more easily. The default value, 1, signals continuous pinfeed paper, but you can still use the [w] command when you wish.

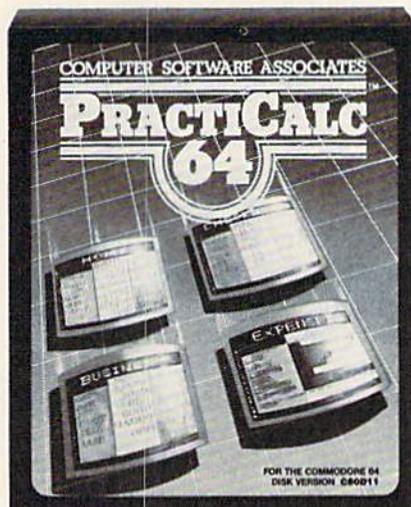
The user-definable reverse video numbers can also be preset in this section of the program. The first four of these probably should not be re-defined. If you often share files with friends, you should consider standardizing your use of pre-defined numbers. (See below for tips on setting the user-definable codes.)

After setting the values, the program will ask if you wish to continue or rerun. Check the values and press r if you find any errors (the program will start over from the beginning). Otherwise, press C to continue, then enter the filename you want to use for your new customized version of SpeedScript and press RETURN.

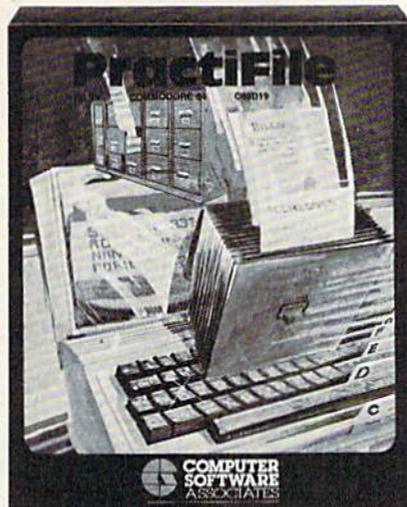
Make sure to give the new SpeedScript a unique name so that when you have several copies saved you'll know which one to load. (SpeedScript Customizer doesn't allow the SAVE with replace option, so you can't destroy the original SpeedScript while using the Customizer.) Remember that no matter what version you use, the default values can still be changed using the CTRL-£ commands in SpeedScript.

When the program finishes, it resets the BASIC pointers and saves your modified SpeedScript. If all goes well, the program will automatically RUN your new version. Disk users should check the error channel by pressing the up-arrow key while holding down CTRL, then pressing RETURN. Next, look at the directory using SpeedScript's CTRL-4 command. Tape users can recover from errors (for example, if RECORD was not down during the SAVE) by pressing RUN/STOP-RESTORE, then typing SAVE "new filename", 1 followed by RETURN. If the program does not execute properly, remember to turn the computer off, then on again

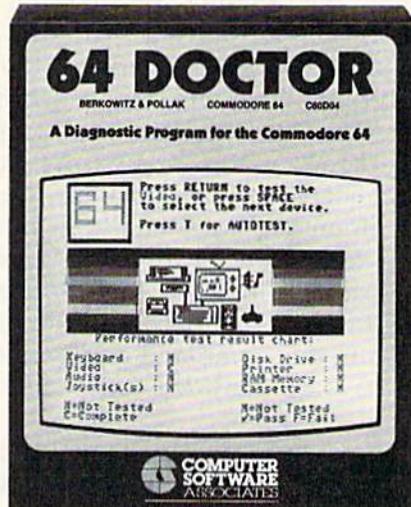
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before doing other programming. This will reset the memory pointers to prevent problems and free up the memory space used by the Customizer.

How SpeedScript Customizer Works

The Customizer is an example of how to have two programs in memory at the same time, using one program to modify the other. This technique is described in *COMPUTE!'s Mapping the Commodore 64*.

Program 1 (line 8) determines whether the computer in use is a VIC or 64 by using the Kernal SCREEN routine. This checks the number of columns, 22 for a VIC, 40 for a 64. (This is how the "MENU" program on the GAZETTE DISK knows if you have a VIC or 64.) Based on which computer it finds, it adjusts the start of BASIC to a point above where SpeedScript normally resides in memory. The boot program prints the necessary commands on the screen, then fills the keyboard buffer (a small area of memory that temporarily stores character information) with a HOME character, two RETURNS, an exclamation point, and the code for LOAD and RUN (because of the exclamation point, the computer ignores the LOAD command and performs the RUN). This is how it boots (automatically loads and runs) Program 2.

The Customizer again checks which computer is in use and sets the values of several variables. Line 50 of Program 2 loads SpeedScript into its usual place in memory. That explains the extra ,1 at the end of the LOAD command. The computer ignores SpeedScript, though, since it is below the current start of BASIC.

Next, it tests to see which version of SpeedScript is currently in memory by PEEKing a designated memory location. It then tells you what it has found (lines 56-64). Lines 66-86 handle the default color selection, and INPUT statements allow you to change the normal values for print formatting (lines 88-122).

To make the program work with all versions of SpeedScript, Program 2 contains its own definition tables. Three of these tables are located in lines 128-132. Depending on what version of SpeedScript is in memory, one of these tables will be used to point to the location in SpeedScript that holds the background color (BL), letter color (LL), and the start of SpeedScript's definition table (DT). Line 134 POKEs these locations with the values you have assigned in Customizer.

If any future versions of SpeedScript become available, the pointers in the Customizer can be changed so that it will modify the new versions.

A simple machine language monitor, BASIC PEEKing loop, or even an MLX listing would be enough to find the definition table; just look for consecutive memory locations that hold 5, 75, 66, 5, 58, 2, 1, 27, 14, 15, 18, 0, 0, 0, 0 (the values that are predefined). The variable DT in the Customizer would need to be set equal to the memory location that holds the first value (5) in the list above. The locations referenced by the variables BL and LL might need to be readjusted, as well.

Line 150 of Program 2 determines which table to use for POKeing the BASIC pointers to the right values before saving the modified version of SpeedScript. When a SAVE is performed in BASIC, the start address of the block of memory to be saved is contained in locations 43 and 44 (in standard low-byte/high-byte form). The top of the block to be saved is one position below the value contained in locations 45 and 46 (called the start of BASIC variables, stored in the same format).

Lines 160-168 print the statements to perform the POKEs and to save and run the new SpeedScript; they also fill the keyboard buffer with a HOME character, three RETURNS, an exclamation point, and the code for LOAD and RUN. The Customizer vanishes from sight as it is replaced by SpeedScript. (Actually, it's still high in memory, but is now unavailable for use.)

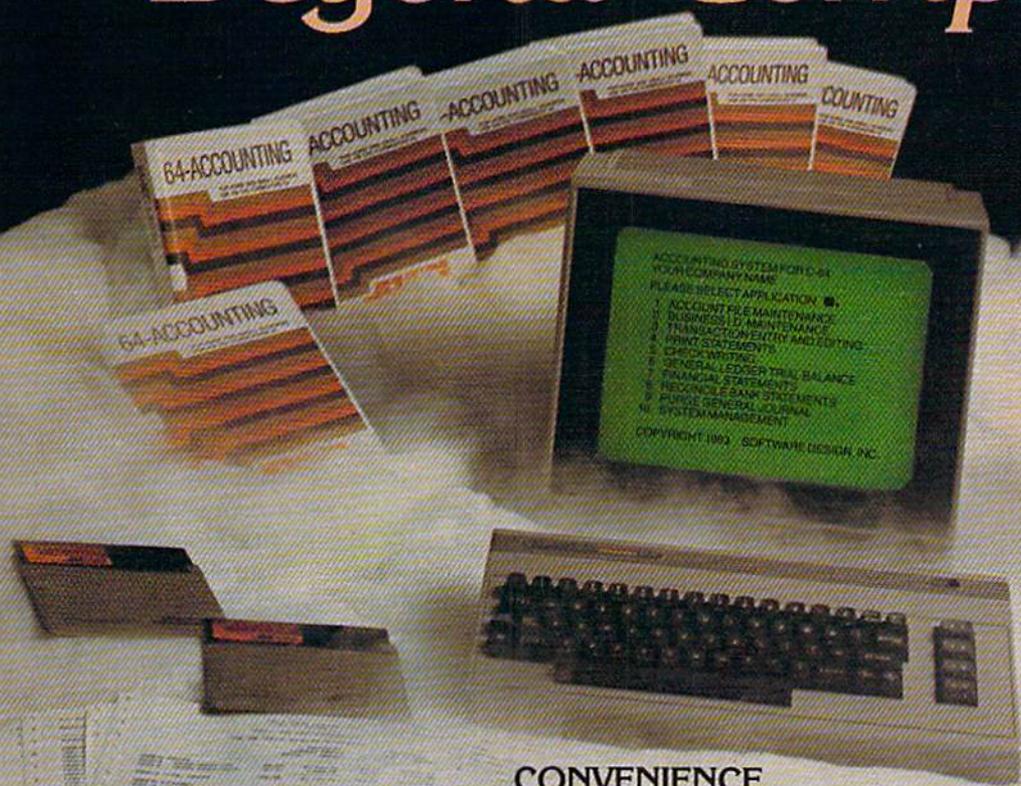
More On Sending Printer Codes

Most printer codes are easy to send, and are listed in the printer and interface manuals. Gemini Star and Epson (Grafrax) owners, for example, can send the ESCape code (CTRL-£ 1, represented in this article by [1]) followed by a 4 in the text of the SpeedScript file on the screen to cause the printer to print in italics. To turn the italics print off, send [1]5. Some interfaces, including the Tymac Connection, require sending the ESCape code twice when using emulation mode. (If you have problems, refer to your printer/interface manual or "SpeedScript Revisited" in the May GAZETTE.)

Some printer features require three codes to be sent, though. On the Gemini Star, for example, the code to trigger the continuous underlining mode is ESC-1. Sending this to SpeedScript as [1]-1 doesn't work though. To send the codes properly, you need only define a reverse video number to the value 1. Since [1] is already used by SpeedScript, we'll use [8]. From within SpeedScript, this would look like: [8]=1 (the Customizer allows you to set default values for the reverse video numbers, so they don't have to be defined on the screen). Then, simply insert [1]-[8] immediately before the text you wish to underline. That's fine, but now let's turn it off.

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The code sequence for turning off the continuous underline feature of the Gemini is ESC-0. Unless it is defined otherwise, the default value of [9] in SpeedScript is zero. So, we'll place the following group of characters on the screen after the word or phrase we want underlined: [1]-[9]. Any three-character code sequence can be sent in this manner to the printer, so the Gemini's foreign character sets can be accessed by SpeedScript. See the following table of printer codes for the Gemini, and if you have another printer, refer to your manual and see how many features you can access. We've used SpeedScript to operate letter quality printers as well, and it works fine if you redefine the codes to match those that the interface and printer will accept.

SpeedScript Format To Access Selected Gemini and Epson (Grafrax) Features

(This table uses these preset values in addition to the predefined default settings: [5]=20 [8]=1 [9]=0.)

[2]	enlarged (double-width) print (cleared when a carriage return character is sent)
[3]	condensed print (use [5] instead with some interfaces)**
[4]	pica print
[5]	cancel enlarged print (use [3] instead with some interfaces)**
[1]4	italics on*
[1]5	italics off*
[1]E	emphasized on*
[1]F	emphasized off*
[1]G	double-strike on*
[1]H	double-strike off*
[1]O	disable skip-over perforation
[1]S[8]	subscripts on
[1]S[9]	superscripts on
[1]T	sub/superscripts and unidirectional printing off
[1]U[8]	unidirectional printing on
[1]U[9]	unidirectional off
[1]W[8]	double-wide printing on (alternate method, not cleared by a carriage return character)
[1]W[9]	double-wide printing off (alternate method)
[1]Y[8]	enable buzzer
[1]Y[9]	disable buzzer
[1]-[8]	underline on
[1]-[9]	underline off

* indicates this command works for Epson Grafrax.

** Some interfaces, notably CARDCO and XETEC, swap these two codes, CHR\$(15) and CHR\$(20).

To access foreign character sets, send [1]7[7] after defining [7] to one of the following values:

- 0 = American
- 1 = British
- 2 = German
- 3 = Danish
- 4 = French
- 5 = Swedish
- 6 = Italian
- 7 = Spanish

Some printers use only DIP switches to invoke foreign character sets, so they won't take these codes; just flip the right switches and you'll have it. After selecting the character set you wish to use, some of the special characters may be obtained from the keyboard and some will require the use of the user-definable reverse video numbers in SpeedScript. Compare the printer manual and the Commodore ASCII chart in the *Programmer's Reference Guide* and experiment. A closed bracket (]) in the text on the screen in SpeedScript with the Spanish character set activated, for example, would cause an inverted question mark to be printed (if you're using a Gemini printer).

Even when using the normal character set, symbols on the screen obtained by pressing the Commodore logo key will cause the printer's (or the interface's) characters to be printed. You can access a good number of graphics and special characters (most of the printer's characters with ASCII codes from 161 to 191) from within SpeedScript this way. Just compare the ASCII charts in the printer and computer manuals.

Other features are available by defining the reverse video numbers. For example, to have the printer backspace one character (this allows you to print accent marks), just define a reverse video number to the value 8 (some printer/interface combinations will interpret this value as a graphics command, so consult your manual and define the number as you need it). Then, whenever SpeedScript finds the reverse video number in the text, it will backspace. To activate the printer's internal buzzer during a printout, you could define one of the reverse video numbers to the value 7 and place the defined number in the text where you wish, even in the footer.

If you get confused about all the codes, remember that the first place to go for answers is the manual. If things don't work right, keep trying. Keep track of where you've been and you'll know where to go in the future. Some printer functions will not work while others are in effect. For example, some printers will not print superscripts while printing in emphasized mode, but automatically double-strike the superscript data. If you can't get signals through the interface at first, try using SpeedScript's CTRL-P command and resetting the secondary address to the interface's *transparent* (no ASCII correction) mode. In most cases, once the printer is set it will stay in that mode until you send codes to change it (or until you turn the power off somewhere in the system).

One final note: Whenever you want to include a memo about a file you are SAVEing, use a SHIFT-SPACE to separate the filename from the memo. For example, if you want to SAVE a

note about City League Baseball with the name "clb" and have a note in the directory that says "spdsr" (to indicate it is a SpeedScript file), enter the filename as below:

SAVE:clb[SHIFT-SPACE]spdsr (in SpeedScript; a small dot will appear where the [SHIFT-SPACE] was entered), or

SAVE"CLB[SHIFT-SPACE]SPDSCR",8 from BASIC.

The file will LIST in the directory as follows (assuming it is 4 blocks long):

```
4 "CLB"SPDSCR PRG
```

You can then LOAD the file with the short name (CLB) or the long name (CLB[SHIFT-SPACE]SPDSCR).

See program listings on page 153. 

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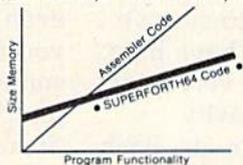
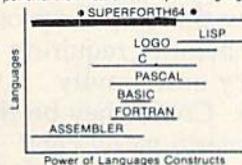
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REVIEWS

Three Arcade Games For The VIC-20

Steve Hudson, Assistant Editor

There are a *lot* of arcade games for the VIC-20. Some are ho-hum; others are pretty good. But a few of them are really worth knowing about—and three of the best, *Moon Patrol*, *Jungle Hunt*, and *Pole Position*, have recently been released by Atari as part of the Atarisoft series.

Atarisoft games are conversions of popular Atari games for use on other computers. They may be just what you've been waiting for if you're an arcade fan. But even if you don't own a joystick, these games offer exciting and entertaining evidence of what the VIC can do. After seeing them in action, you may find you're more of an arcade fan than you thought.

Moon Patrol

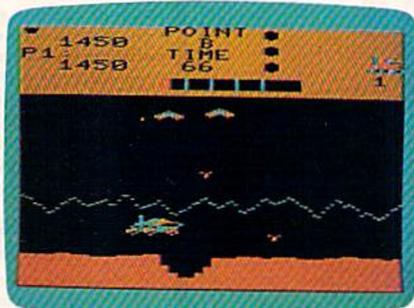
You had always wanted a job with the Luna City Police Department, so you were thrilled when they finally made the offer.

"You'll like it here," said the captain.

"Great place to work," said the sergeant.

"It's a perfect job," said your partner. "Unless you get assigned to *Sector Nine*."

Sector Nine. You'd heard rumors about it: a wasteland plagued with tanks, small rocks, large rocks, and mines, not to mention small craters, large craters, rolling rocks, flying saucers,



You must clear yawning craters in a single bound while watching out for attackers from above in Moon Patrol.

satellites, and even enemy patrol cars. It was a sector from which experienced officers rarely returned, let alone inexperienced rookies.

But that's where you ended up.

"It'll toughen you up," said the captain.

"It's a challenge," said the sergeant.

"It's a perfect job," said your partner. "Just be sure you've made out your will."

Unfortunately, the will was one of the things you never got around to. Just too busy packing up to move to Luna City. With a shrug, you climb into the patrol car.

You'll just have to survive. Fortunately, you have help.

That patrol car is the very latest, with a built-in antigravity jumper and laser cannons. Each is controlled by a single lever (which looks suspiciously like a joystick), and you only have to push the joystick—uh, lever—away from you to make the pa-

trol car jump. To increase the car's speed, push the stick to the right; the car slows down when you move it to the left. The laser cannons (which simultaneously shoot straight up and straight ahead) are controlled by the fire button.

The beat is divided into two patrol routes. One is designated the "beginner" route, for obvious reasons, while the other is known as the "champion" route. There aren't many champions left. A calibrated scale at the top of the screen shows how far you have gone (and how far there is to go), and you can select the route to patrol by pressing f5. Press f3 if you're on patrol by yourself; press it again if someone else is coming along.

Pressing the f1 key starts things rolling. Actually, "bumping" might be a better description of the ride. It's rough out on the lunar landscape, even with those big balloon tires to cushion the ride. The wheels follow the dips in the terrain as your car moves through the smoothly scrolling landscape, and they automatically retract whenever you make an antigravity jump to clear a crater or obstacle. Some barriers, like rocks, can be blasted with the laser. Others you'll have to jump. You hear that there are even a few that sneak up on you from behind, requiring some fancy anti-gravity jumpwork. Could they be the dreaded *enemy patrol cars*?

Whatever they are, they're worth 800 points apiece. You also get points for blasting rocks or flying saucers, for knocking down hostile satellites, for

REVIEWS

jumping obstacles, and for dodging rolling rocks.

Realizing the difficulty of your assignment, the Department has given you four patrol cars (one for starters and three in reserve). They've also given you an unlimited supply of laser bullets, as well as a pause control (the space bar) which stops your car in case you want to step outside for a breath of fresh vacuum.

Nice folks, those Luna City administrators.

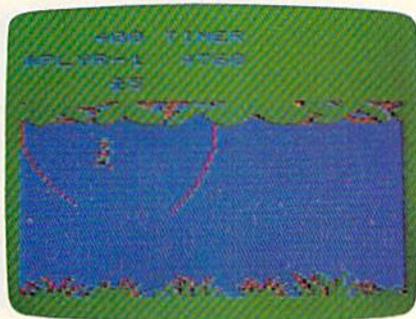
Jungle Hunt

Urban adventurers, here's your chance. Get ready to explore the jungle and be a hero. In *Jungle Hunt*, you must brave the perils of an uncharted wilderness to save your beloved from the cannibals—and though it may be just another rescue mission, it's not just another game.

When the adventure begins, you're at the edge of the jungle and out on a limb—literally—waiting for a swinging vine to come within reach. Closer... closer...you jump, grabbing for the vine before it flies out of reach. If you catch it, you'll be on your way. If not, you start over.

After ten successive vines, you reach the edge of the river. Its surface is broken by gentle waves; it looks quiet and peaceful. Confidently you let go of the vine and dive into the warm, tropical water.

Then you see the shapes, and they're much too big to be mere fish. Crocodiles! It's too late to turn back. Diving to meet the foe, you pull a dagger from your belt. Watch out for those



The intrepid jungle explorer swings into the great green unknown in *Jungle Hunt*.

air bubbles, too. If you get caught in one, you're helpless until you reach the surface. And crocodiles just love helpless heroes for lunch.

Finally, you reach the far bank. There, at the top of a long slope, is the cannibal village, where your beloved awaits your rescue. Up the slope you go, but the natives are rolling boulders down the hill to stop you. Fired by determination, you rush up the slope, jumping the boulders as they come. The cannibal village comes closer—but can you get past the natives in time?

With its constantly moving, smoothly scrolling graphics, *Jungle Hunt* really does put you in a subtropical jungle. Each part of the jungle offers a different challenge, from vine hopping and crocodile dodging to

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boulder jumping and finally rescuing the damsel in distress. The graphics are appealing, and you'll find that the sound effects accentuate your enjoyment of the game.

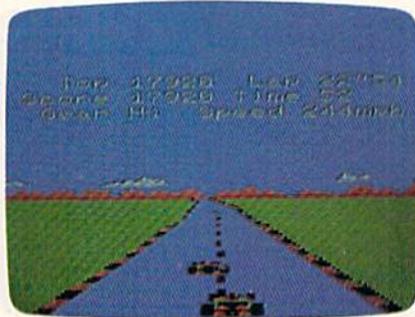
The screen display shows your score, the remaining time, and the number of heroes you have in reserve. When you're crossing the river and have to dive, it also shows how much longer you can hold your breath. That's really all you need. Other information might just be distracting—and you'll need all your concentration to get through the jungle alive.

Game play is straightforward, relying solely on joystick control. Use the fire button to jump or to pull your dagger; the joystick lets you speed up or slow down (and, at the river, to dive or surface as well). Use the function keys to select the number of players (one or two) or to pick a level of difficulty (beginner, regular, or advanced). You win points for swinging from vine to vine, for eliminating crocodiles, for jumping boulders, and so on.

Start the game with the f1 key or the fire button. On higher levels you have fewer men—two instead of five—and you'll find that some situations are much more dangerous.

Pole Position

Most days, the drive to the corner store is not particularly exciting. Between bumpy roads, heavy traffic, and a car that does 0-to-60 in roughly four days, I'm in no danger of imitating an Indy 500 race car driver.



Pole Position offers long straightaways and challenging curves at a top speed of 244 miles per hour.

But now and then I imagine roaring along smoothly at 200 miles an hour, taking the turns with steady precision and handling the car with the practiced grace of a skilled pro.

Now VIC owners have a way to experience that thrill without ever leaving the driveway. It's *Pole Position*, a scaled down version of the popular arcade game.

You're the driver of a high performance racing car, and your car is a marvel of sophisticated engineering. Like those Luna City police cars, it's operated by a control lever that looks a lot like your joystick. Push the lever forward to accelerate; pull back to slow down. Move the stick left or right to steer. The car is also equipped with an advanced two-speed transmission that you shift by pushing the fire button, and it has a top speed (in high gear) of 224 miles per hour.

You race on a remarkably realistic field. The course itself is a smooth two-lane track, winding through a fertile green valley. The surrounding mountains sit on the horizon, and the view shifts as you navigate the

course—just as it would were you actually driving. There are long straightaways, and there are treacherous turns. Track boundaries are clearly marked in red and black, and though you can't run off the road, you will immediately lose speed if you stray from the pavement and run onto the shoulder.

Select from three skill levels (beginner, intermediate, or advanced) by pressing f5. Start at the beginner level to get a feel for the game and the response of the controls. Then, when you're comfortable with your skills, move up to intermediate and advanced levels.

Press f1 or the fire button to start the qualifying run. As soon as you do, a blimp will fly over the track, trailing a banner that reads "PREPARE TO START." You'll see your car sitting at the starting line. The starting light (on the left side of the screen) will flash red three times, then turn green, and the race is on.

Nothing happens at first, even though the timer is steadily counting down. You'll have to step on the gas (push the joystick forward) to start moving. Hold the stick forward to accelerate (and press the fire button to shift into high gear, for even greater speeds) and you'll soon begin to overtake the other competitors.

That's when you'll really need all of your skill. Steering with the joystick, weave in and out of the pack, running up a good qualifying time without running into other cars. If you collide with another racer, you'll crash with an appropriate burst

of flames and a cacophony of crunching metal. However, you've got an unlimited number of cars (within the allotted 90 seconds per race), so you will at least be able to start up again and run out the clock. It's challenging, to say the least. But the reward is the pole position in the upcoming race, a prize worth any racer's best effort.

Once you've qualified, the race begins. Again, the driver's-eye view is remarkably realistic; you can actually see other racers around you. How many you see depends on your starting position.

During the race, use the joystick to maneuver just as you did in the qualifying run. Again, you have an unlimited number of cars. At the end of the race, the display will indicate your total score, based on distance covered and other cars passed. You'll rack up more points if you shift into high gear to cover more distance and pass more cars. But you'll also run the risk of more frequent crashes and more lost time.

Racing is exciting business, and *Pole Position* captures many of the sights and sounds of the track. The graphics are outstanding; so are the sound effects. You can even press the space bar to temporarily halt the action, in case you need to make a pit stop or grab some milk and cookies.

But the highlight is the excitement of handling the racer itself. Like any vehicle, your VIC racer is harder to control at higher speeds. Though it takes some getting used to, you'll quickly learn to steer into curves

and weave in and out of the pack. And it won't be long until the coveted pole position is yours.

Entertaining Exertion

As you play these games, you'll find yourself getting more and more involved in the plots. Certainly they're entertaining. But they require quick reflexes and even a certain measure of strategy to win. Should you jump the moon crater now or wait another second and try for that tank? When should you let go of the

vine? Can you accelerate into the curve and still make it by those two cars? The list of decisions goes on and on, and after a session with any of these games you may actually find yourself breathing a little harder than when you began.

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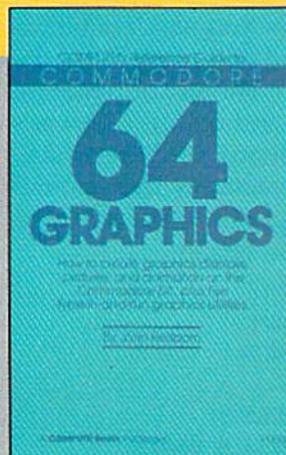
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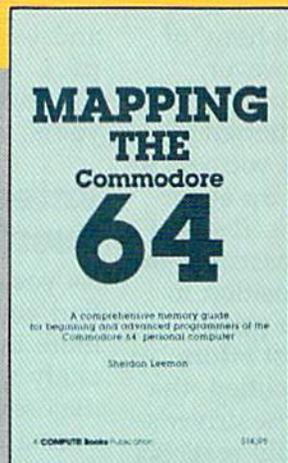
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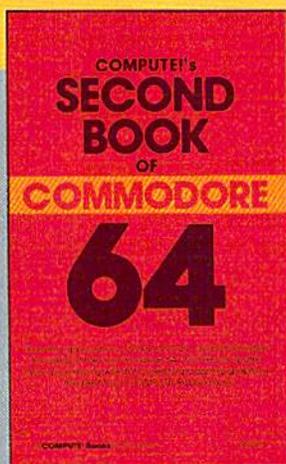
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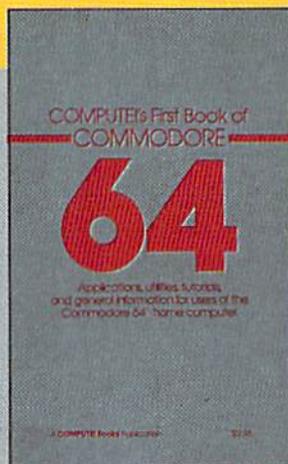
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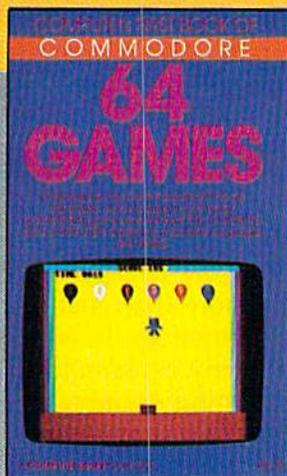
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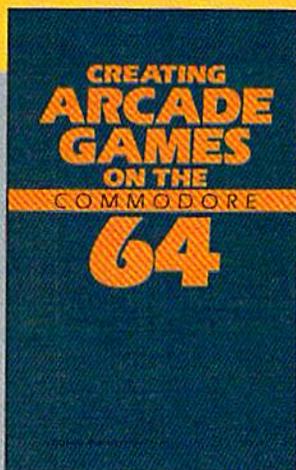
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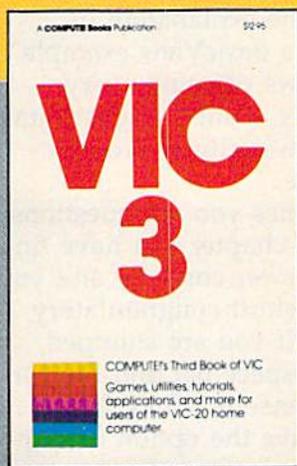
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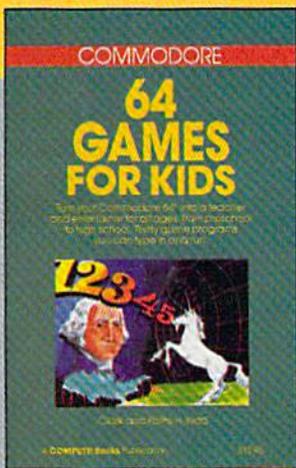
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CodePro-64

Todd Heimarck, Assistant Editor

Learning a language is more than just memorizing a list of words or phrases. And BASIC is not that much different than, say, French. To become truly fluent requires practice and practice and more practice.

If you hopped on a jet to Paris tomorrow, bringing nothing more than a phrasebook and a translator's dictionary, it would be a chore to get across anything more than the simplest of ideas. You might mispronounce a word like "gare," asking directions to the war of the north, when you meant to ask the location of the train depot of the north.

A Step-By-Step Tutorial

CodePro-64 is a software package designed to teach BASIC to beginners. It is like a combination phrasebook/dictionary—it gives you the necessary vocabulary, the first step towards fluency.

If you buy all of your software and don't care to delve into the mysteries of IF-THEN and FOR-NEXT, you probably don't need *CodePro-64*. But for a newcomer to computing who wants to start using BASIC, this package from Systems Management Associates (SMA) can provide an excellent introduction.

It runs on a Commodore 64 and 1541 disk drive. The package includes two disks, a 100+ page manual in a three-ring binder,

and a warranty/registration card.

Before you can begin, you must follow the installation procedure, a few steps that write a serial number to the disk as a form of identification and copy-protection. You are also reminded to mail the postage-paid card, which registers your warranty and puts you on a mailing list to receive periodic updates and enhancements.

You then LOAD the main program and you're ready to start learning BASIC. The program is menu-driven; you see a list of choices, accessed by pressing the appropriate key.

It's quite easy to find your way around the menus. Function one (f1) always returns you to the main menu. Pressing f3 brings you back to the local menu. Pressing f7 advances one page, while f8 pages backwards. You don't have to remember all of this, the options appear at the bottom of the screen. At the top of the screen is a reference number which points the way to the appropriate page of the manual.

After making a choice from the menu, you may see a local menu, from which you choose the topic you want to study. To get anywhere in the program requires pressing no more than two keys. The two disks contain 18 programs. Depending on which topic you choose, you may have to wait a minute or two for the program to load, which gives you a chance to scan the relevant chapter in the manual.

Most of the program is text, something like a large electronic

book. To turn the page, press f7.

But it's more than just a disk full of sentences. In addition to the many explanations and programming examples, *CodePro-64* offers something called BasicView, which is best described as an animated mini-program. Rather than just reading about FOR-NEXT loops, you can see one in operation. Pressing the space bar moves you line by line through the program. Upon reaching the NEXT statement, an arrow grows from the BASIC line back to the FOR that initiated the loop. A ball travels along the arrow's path, back to the beginning of the loop. In the explanation of GOTO is a BasicView example with arrows pointing every which way, a subtle representation of unstructured programming style.

At times you see questions about the chapter you have finished. Answer correctly and you receive a short congratulatory message. If you are stumped, press the space bar and the correct response is printed. You always have the option of skipping the quizzes and going to the next page.

The manual complements the main program. Pictures of most of the screens are included, as well as additional elaboration on the finer points of programming.

CodePro-64 has four main sections. The first is an introduction, which explains how to use the function keys to move between menus. Also included is a brief introduction to the keyboard—how to switch from uppercase/graphics to upper/

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lowercase characters, the color keys, graphics, quote mode, and so on.

The programming tutorial takes up section two, which begins rather slowly with a detailed explanation of program flow (from low-numbered lines to higher lines), variables (floating point, integer, and string), constants, arrays, expressions, and operators (numeric, string, and logical). The pace quickens when BASIC keywords and commands are introduced, one-by-one, complete with Basic-View examples and quizzes.

How to program music and sprites is covered in the third section, a fairly short tutorial about the various registers and necessary POKEs. A sprite-design utility is provided, as well as two musical composition programs. One turns your 64 into a piano-like keyboard, for testing different sounds—violin, tuba, drum, etc. The other allows you to write simple melodies which can be edited and played back.

The final section contains some sample programs and lets you look up the meanings of BASIC keywords (like a dictionary on disk).

New ideas are introduced in a logical order, beginning with elementary concepts like variables and building to more complex programming structures (sprites and music). It is not something that could be completed in an hour or two. There is a lot of information to be digested, which could be spread over a period of days, weeks, or even months.

A BASIC Phrasebook

After completing *CodePro-64*, will you be a programming genius? Frankly, no. You can't learn BASIC in a week; you need practice. But before you can practice, you need to understand the grammar and vocabulary. This is where *CodePro* comes in. It should give you a good headstart on gaining fluency. It's like one of those foreign phrasebooks that gives you stock sentences and a working vocabulary.

A chapter at the front of the manual develops the analogy of a foreign language, emphasizing that to become a good programmer, you must write hundreds of programs. It's not enough just to study about writing programs.

Primarily For Beginners

This package is designed for programming neophytes, new computer owners who don't know a thing about the ins and outs of BASIC. The less you know, the more you'll learn. If you have more than a year's experience, you may find some of the sections a bit simple.

As a general introduction to the Commodore 64, BASIC commands, sprites, and music, it is very good.

The explanations of BASIC commands are thorough. Considering the technical subject matter, it's written in a clear, easy-to-understand style. And it's well conceived and easy to use, due in part to its system of menus.

The self-paced format lets

you take as much time as you need to master each chapter, unlike a classroom where you are (inevitably) ahead of or behind the rest of the students.

The BASIC reference table is useful for refreshing your memory of how certain keywords work. It could be a good tool for tracing or flowcharting a BASIC program written by someone else (although disk access can be slow at times).

The sprite utility explains clearly the steps to create sprites and move them about the screen. The two music programs contain some good examples and give you a feel for the many capabilities of the SID chip.

There are some misconceptions and outright mistakes, however.

In the introduction, you are told BASIC program lines can have any number between 0 and 32767. Actually, the maximum line number is 63999 on the Commodore 64. In the same section, floating point numbers are introduced. It is explained that they can have up to nine significant digits—from +999,999,999 to -999,999,999. Scientific notation (which includes numbers such as 1.895E13) is not mentioned. Also, when arrays are introduced, the zero elements are ignored (although they are covered later, in the explanation of DIMension).

Some fairly important subjects are given short shrift: how to read the joystick, some of the POKEs and PEEKs available, the difference between Commodore ASCII and true ASCII, how to

REVIEWS

plan out a program and then debug it, various things you can do with tape and disk files. But if every aspect of BASIC were covered, there would probably be ten or twenty disks and a thousand pages of text.

The introduction does too much a bit too quickly. It makes sense to introduce variables and constants before BASIC commands, but a beginner does not need to know that 177 AND 157 equals 145 before learning to use PRINT or INPUT or FOR-NEXT loops. It might be best to skim through the introduction (and ignore the part about logical operators), go on to BASIC, and return to the introduction at some later point. The menu facilitates moving easily to later chapters.

The music and sprite programs do not compare favorably to good commercial software; they are somewhat slow and awkward to use. As programming utilities they are lacking, but as teaching tools they are effective.

CodePro-64 is a solid introduction to BASIC programming on the Commodore 64. Despite the minor flaws, it's a thorough and substantial tutorial.

CodePro-64

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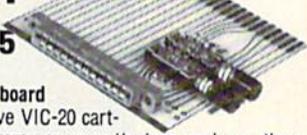
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Micro Worlds For Young Children

Fred D'Ignazio, Associate Editor

Good Robots Vs. Bad Robots

It's fascinating the way children can create a miniature world out of a couple of beat-up old boxes, or a sandbox full of sand, or a bathtub filled with bubbles.

For example, the other day my five-year-old son Eric borrowed a couple of new toy robots I had bought for my speeches and took them down into the basement. "Come here, Daddy!" he called, only five minutes later.

He made me close my eyes, and he led me down the stairs. As I followed Eric down into the cellar, I walked out of my world into a new world he had dreamed up. He had fashioned some cardboard boxes into a mountainous planet. On top of the boxes he had placed buckets and sections of packing styrofoam. A thin layer of playing cards covered the buckets and styrofoam, concealing treacherous traps and pits.



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Poster, Secret Filer and Double Feature Mystery/Adventure designed and developed by Information Technology Design Associates. Turtle Tracks designed and developed by Thomas R. Smith. Square Pairs designed and developed by Glenn M. Kleiman, Teaching Tools: Software, Inc.

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Eric had divided the robots into good guys and bad guys. The bad robots were chasing the good robots, but the good robots were tricky. They sidestepped the pits. The bad robots rolled out onto the cards and immediately crashed down into the pits.

Eric and I cheered. Then Eric turned to me and ordered me back up the stairs. "You go away, Daddy," he said. "I want to build a new planet."

The Computer Sandbox

In his book, *Mindstorms: Children, Computers, and Powerful Ideas*, Seymour Papert wrote about "micro worlds," miniature worlds inside the computer that children could create themselves. Children could actually step inside these worlds and become their heroes and heroines.

Computer micro worlds are, of course, made out of software—game programs and simulations that build models of the real world or worlds of fiction and fantasy. Until recently, most computer micro worlds have been very limited in scope and appeal. They have been suitable only for teenagers or adults. Many of the micro worlds have been sexist, violent, and destructive. And they have had repetitive, unimaginative themes: dungeons and dragons, battles in outer space, aerial dog fights, and so on. Most of the video games and arcade games in which the micro worlds appear have been too difficult (and too tall!) for younger children.

In the last twelve months, however, the situation has changed drastically. A new breed of software companies—like Children's Television Workshop, HesWare, The Learning Company, Sunburst, Spinnaker, and Joyce Hakansson Associates—have begun creating computer programs that feature imaginative micro worlds for pre-teens and younger children.

We recently received a number of these new programs to review, all published by CBS Software, all for the Commodore 64. Here is a sample of some of the computer micro worlds your kids can visit. And, before they head out, ask them if you can tag along. A child's adventure in a micro world can be greatly enhanced if they have Mom or Dad at their side.

Ducks Ahoy!

Ducks Ahoy! is a game for one child aged 3 to 6. The game costs \$29.95 on disk, \$34.95 on cartridge, and requires a joystick.

Joyce Hakansson Associates designed *Ducks Ahoy!* It is only the second game I've found where pictures on the computer screen were just as appealing as the colorful cartoons on the package. (The first was Joyce Hakansson's *Alf in the Color*

Caves, published by Spinnaker for the Commodore 64.)

This game is a delight. You and your child go on a journey to Venice, complete with canals, gondolas, a beach, a boardwalk, a boathouse, bridges, a tiled piazza, and lots of brightly colored Venetian buildings.

The buildings are full of silly, quacking ducks who wander around, then come out the front door and hop into the water. The animation and the sound effects are so good you are tempted to watch the ducks and forget about the game.

Your goal is to take a boat out of the boathouse and (with the joystick) maneuver the boat through the canals and under the bridges to the ducks' houses. You try to predict which duck is the closest to jumping, then you zoom over and place the boat directly in front of him. If you make it in time, the duck leaps into the air and lands, KER-PLOP!, in your boat, nearly capsizing it.

Now you have a choice. Either you can go get another duck, or you can pole your gondola to the beach and unload the duck.

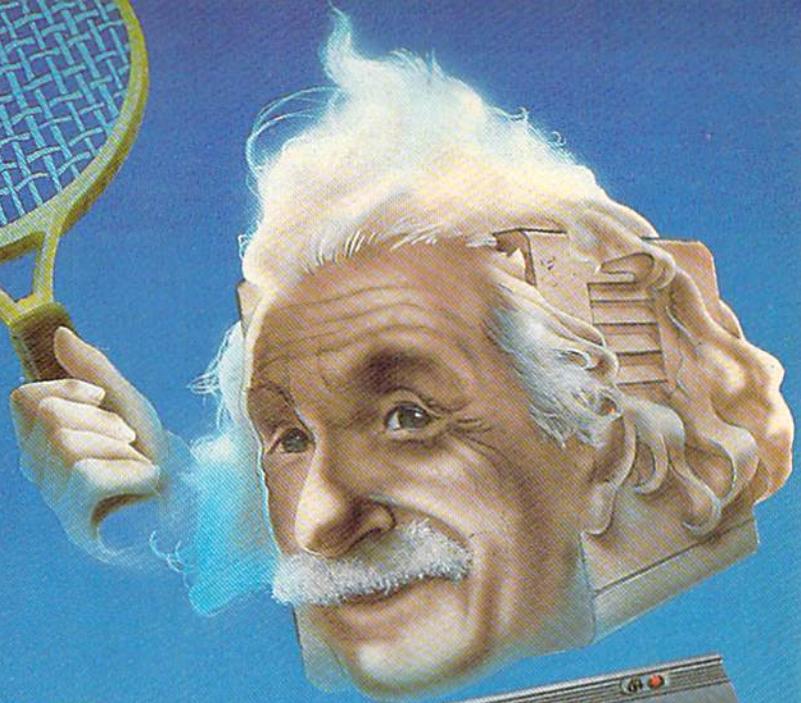
The object of the game is to carry ten ducks to the beach and to allow as few ducks as possible to leap into the water. This would be a fairly simple task if it weren't for a mischievous hippo who floats around the canals under the water. Whenever your boat gets too close to the hippo, he comes up beneath it and capsizes it. If any ducks are on board, they escape. Fortunately, you can keep an eye on the hippo by watching for bubbles in the water. On the other hand, you sometimes get to racing around the canals so fast you don't see the bubbles until it's too late.

Eric and I both enjoyed playing *Ducks Ahoy!* It helped him with his counting, eye-hand coordination, and prediction skills. It was also perfectly suited for his physical and emotional level of development. It was challenging and engaging, but it was not so difficult that he became frustrated.

I found several of the game's features especially attractive. First, Eric kept rescuing the ducks not because he wanted to win the game and get ten ducks to the beach, but because the game was so much fun. I think that's what makes this game so successful. What motivated Eric to keep playing the game was not the educational goal but the sheer thrill of playing.

Second, the graphics, the sound effects, and the music in the game are so good, you really feel like you have entered a micro world—a make-believe world inside the computer. The world has substance, detail, and variety, yet is not so complex that it's distracting or overwhelming for a young child.

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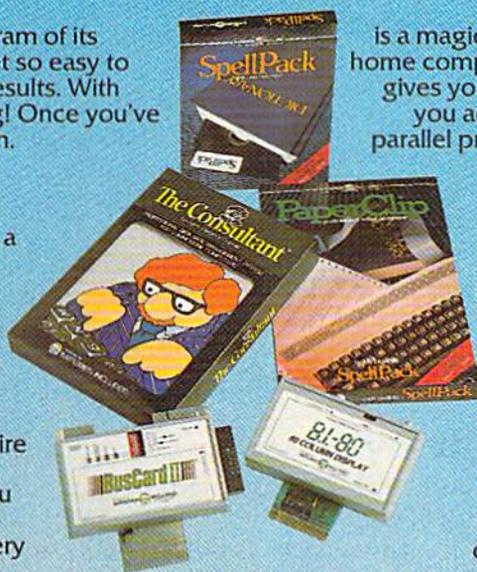
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Third, the game is *funny*. Too few computer games—especially educational games—are humorous. This game is, and that adds to its appeal.

Fourth, the game has *charm*. Unlike many educational games, it doesn't look garish or ugly when compared with activities on other media, such as television, books, or magazines. Instead it is aesthetically pleasing and attractive. Something at the gut level grabs you when you first turn it on.

A Realistic Game

My children and I really enjoyed the *Sea Horse* game. The scrolling animation, the bright, under-sea colors, and the music brought the micro world to life. In fact, almost too much life. When my five-year-old, Eric, played it, he burst into tears if his sea horse came too close to a lagoon fish.

Eric wasn't crying because he was going to be eaten. (If a lagoon fish caught his sea horse it would just chase it away, off the screen.) He was crying because of the tension the game creates. He knew that he had to make a move quickly, or those scary fish would come over and get him.

I played the game, and I was surprised at how involved I became. Swimming the sea horse past the mean fish was not a trivial task. For example, I kept ducking into coral caves, but, as often as not, I popped out of another cave right in front of the lagoon fish. I quickly learned that in order to escape I had to plan my moves. I couldn't just panic and dash off in any direction.

I'm proud to say that after being chased out of the lagoon several times, both Eric and I finally mastered sea horse navigation. We successfully maneuvered five tiny sea horses across the lagoon and were rewarded by the raising of a flag on a sunken ship.

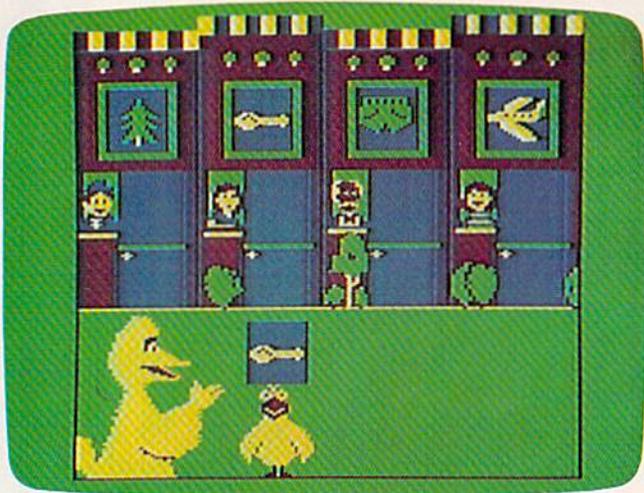
Then a sixth sea horse appeared, back at the beginning of the lagoon. This sea horse was twice the size of the other sea horses. It was too big to squeeze into certain caves, and it was impossible to sneak past a patrolling lagoon fish.

As I write this review, Eric wants me to tell you that *he* has gotten the sixth sea horse across the lagoon—several times, in fact. As for me, well, I haven't quite gotten the knack. But I'm still trying.

Big Bird's Special Delivery

This is a one-player game for children ages 3 to 6. You do not need joysticks; you can use the keyboard to play. The disk version of the game costs \$32.95, the cartridge version \$37.95.

The game was created for CBS Software by the Children's Television Workshop. It features Big Bird and Little Bird, two of the popular characters from CTW's popular "Sesame Street"



TV program.

When the child enters this "micro world," he or she is standing on a sidewalk in front of a row of city buildings. Big Bird appears carrying a special delivery package for Little Bird. Little Bird flaps his wings, flies up to Big Bird, and gets the package. Then it's up to your child to move Little Bird to the building where the package should be delivered.

There are two games and two skill levels for each game. In the first game, *The Same Game*, there are objects in the second-floor windows of each of the buildings. The child has to use the "<" and ">" buttons on the keyboard as left and right arrows to move Little Bird under the building that has a picture that matches the picture on Little Bird's package. Then the child presses RETURN to see if a correct match was made. If so, a person looking out the window nods his head, there is some happy music, and the package floats up to the window. If not, the person in the window shakes his head no, and Little Bird gets another chance.

In the second game, *Find the Right Kind*, everything is the same except this time the child must find a picture in the window that is the same *kind* of thing as the picture on his package. For example, a picture of a bowl appears in the window, and a picture of a spoon is on Little Bird's package. This is a match because the bowl and spoon are both used for eating. (The other three windows, by contrast, have pictures of a piece of fruit, a hand, and a needle and thread.)

Eric and I played this game a couple times, but Eric quickly lost interest. The game gets repetitive since all the child ever sees are the same buildings, with just the pictures in the upstairs windows changing.

Another problem is that the pictures and the words are not very clear. When I was playing the

Look at these Features

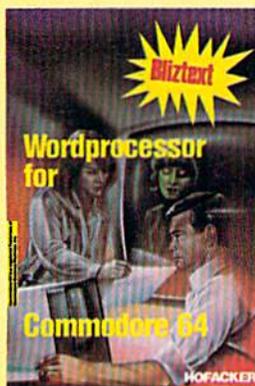
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Find the Right Kind game, for example, I thought the special-delivery package had a picture of a stalk of celery. I tried delivering the letter to the building that had a picture of another vegetable (a pumpkin or squash, I couldn't tell which). I was wrong, so I marched Little Bird and the package down the row of buildings, trying one at a time. I finally got the answer right when I reached the picture of what I thought was a hand.

At first I was puzzled. What did a stalk of celery have in common with a hand? Then I realized that the hand must be a glove, and the celery was really a shirt (or was it a coat?). They matched because they were both clothes.

Since the images are small and not especially clear, a young child might have difficulty recognizing the objects on the screen and become frustrated with this game. In that case, a good picture-matching book might be a better choice than the computer.

Sea Horse Hide 'N Seek

Sea Horse Hide 'N Seek is a micro world for children ages 3 to 6. It was designed by Joyce Hakansson Associates. The disk version costs \$29.95, the cartridge version \$34.95.

It can be played by one or two children, and requires joysticks. Included with the game is a Game Play Guide, an activity book, and a "Find the Sea Horse" poster that children can color themselves.

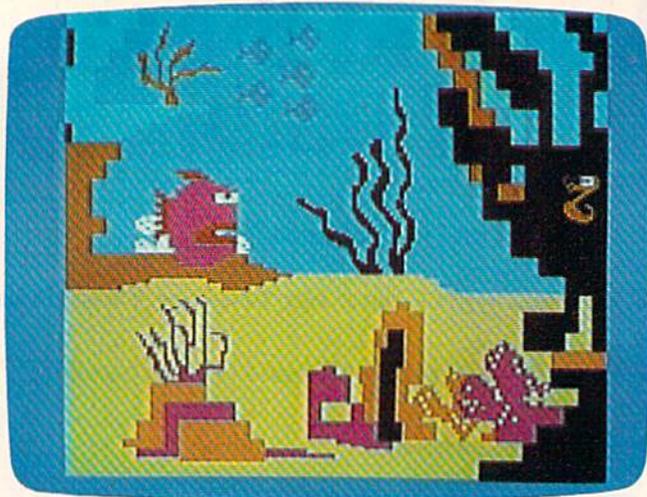
Sea Horse teaches important skills to young children, including matching colors, eye-to-hand coordination, memory skills, understanding of size relationships, and logical thinking. All of these skills are hidden inside an engaging game set in an undersea micro world that's appropriate for a young child.

In this game, children become little sea horses at the bottom of a coral sea. The children have to swim their sea horses past a line-up of funny but ferocious lagoon-fish who try to gobble them up.

When the sea horses begin swimming through the water, the computer plays friendly, happy music. But a few moments later, the music changes and becomes scary. This warns the little sea horse to watch out because a mean fish is coming her way. The sea horse is much smaller than the fish, so she can't hang around. She has to be clever and escape.

The lagoon fish are not very smart, so one way the sea horse can get away is to change colors (with the press of the joystick button) and camouflage herself as a piece of green or pink coral.

Another way to escape is to squeeze inside a coral cave. The caves always have two openings,



so the sea horse will pop out a moment later at the other end. But she has to watch out or she might pop out right in front of the mean lagoon fish. Also, sometimes a grumpy octopus sneaks inside of some of the caves and bounces the sea horse right back out of the cave.

If this happens, the sea horse has two final choices. She can try to swim by the lagoon fish, or she can turn tail and swim back the way she came. But if she does that, she'll still have to face the lagoon fish.

(Desperate sea horses have still another option: They can press the space bar and freeze the lagoon fish. But the space bar freezes sea horses, too, so it's just a temporary respite.)

Peanut Butter Panic

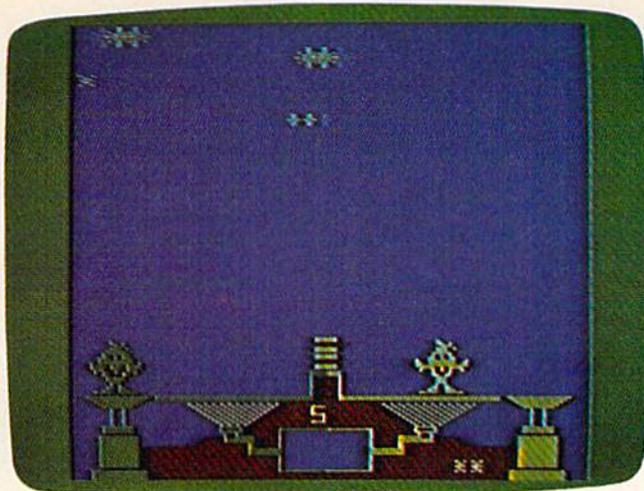
This is a great two-person game. Two children (or an adult and a child) have to work together, share, compromise, and cooperate in order to win.

Peanut Butter Panic was developed for CBS by the Children's Television Workshop. The disk version costs \$31.95; the cartridge version \$36.95. It requires two joysticks and is suitable for children aged seven and up—which means parents and teachers can enjoy it, too.

My eight-year-old daughter Catie and I played this game together. We each became Nutniks—little round creatures whose main goal in life is to make and eat peanut butter sandwiches.

When the game began, Catie and I were standing on opposite sides of a seesaw-like sandwich machine. As Nutniks, we both wanted to make more peanut butter sandwiches. But to make the machine go, we had to jump up high and snag some stars to power the machine.

When one of us ate a lot of sandwiches we



got fatter and heavier, and we could jump on one side of the seesaw and launch the other person even higher to grab the juiciest stars—the ones that made the best sandwiches. But if we kept jumping, we got skinnier, and we had to go back and eat some more sandwiches. Also, if we spent all our time jumping, a hungry Snarf creature would fly out of the sky and gobble up all our sandwiches. This taught us to time our jumps to keep the Snarf from robbing us.

Peanut Butter Panic is primarily an entertaining game. However, it is also a practical exercise in physics and human cooperation. (Catie and I did our best when we coordinated our body weights with our jumps, when we synchronized our jumps, and when we worked closely together.)

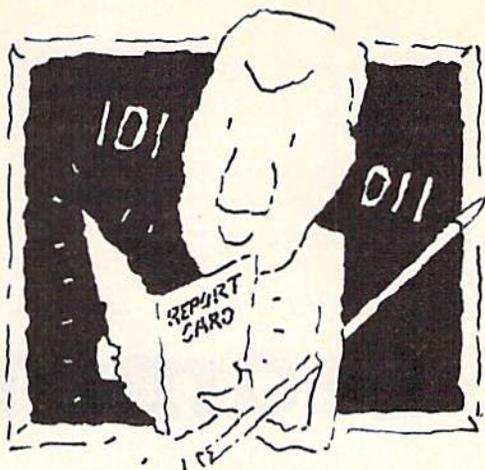
The game encourages communication and interaction between members of the family. And it makes an ideal game for parents to play with their children.

A Warranty, Too

In recent columns, I have called for software packages and materials that are more helpful to the consumer. CBS Software has many of these features, including accurate descriptions and screen shots of the software on the outside of the package; short, simple, easy-to-read user manuals; and activity books. They also have "Startup Cards" to help you begin using the game as soon as you open the package. And all their software has a limited 90-day warranty.

To learn more about these games, you can write or call:

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Learning To Count

William W. Braun

Designed for children in kindergarten through third grade, this colorful and fun program lets you tailor the learning level to your child's needs. For the VIC and 64.

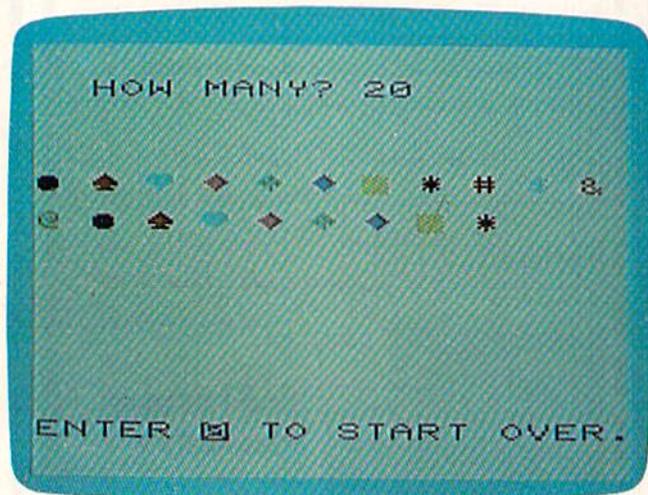
Educational programs are sometimes broad in scope and appropriate for only one learning level. "Learning To Count" teaches a specific concept and allows the parent or instructor to choose the learning level. Although the game is instructive, colorful graphics, sound, and positive rewards make it entertaining for the child.

Selecting A Range

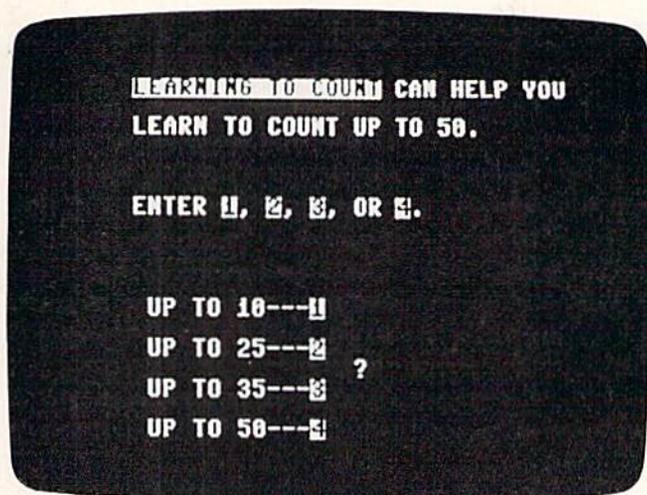
When you run the program, you are first asked to input a number from 1 to 4 to set the range of

objects to be counted. Choosing the lowest range displays a random number of objects from two to ten, while the highest level covers from two to fifty objects. The child is then asked to count the objects and type in the number. A correct answer is rewarded with a smiling face and short melody. A wrong answer elicits a "Sorry! Try Again" response. After three wrong responses, the correct answer is given.

The program continues until a zero is typed. This way, a parent or instructor can control the length of the program or move to a higher level. When a zero is typed, the screen displays the number of tries, the number right, and the number wrong. Then, after a short graphics display, you are asked if you want to continue and at what level.



A child counts colorful objects and is rewarded for a right answer (VIC version).



A parent or instructor chooses the range of objects to be counted (64 version).

VIC Program Structure

Lines

28 POKE 808,114 disables the RUN/STOP key so that small fingers will not accidentally stop the program. RUN/STOP-RESTORE will work, however.

50-60 Graphics and sound at the beginning of the program. A = character code. B = color code. C = tone code. S1 = voice location. Z = beginning of screen memory. COL+Z = color memory location.

70-90 Using INPUT D\$ and then D=VAL(D\$) selects the range of objects to be counted and causes the program to reject any input other than 1 to 4.

100 R = number of right answers. W = number of wrong answers. N = number of tries.

206 A = random number of characters to be POKEd to the screen.

207 Makes sure A is greater than 1.

210 N is incremented for each try, and SCR is the starting point for each line of characters displayed.

225 L = character code. M = color code. K = tone code.

232-236 Make sure each line of characters is separated by a blank line.

245 Allows input of zero to start game again.

260 Detects a correct answer.

270 Detects three consecutive wrong answers.

2000-2007 Create the smiling face and tune.

2500-2501 Give the correct answer display.

3000-3005 Print the score.

4000 Resets the data pointer so the same data for characters, colors, and tones can be used repeatedly.

9000-9001 Data for characters, colors, and tones.

The objects counted by the child are some of the special graphics characters on the VIC and 64, such as hearts and balls. They are displayed in various colors and accompanied by a short tone. The DATA statements at the end of the program contain the codes for the characters, col-

ors, and tones in groups of three.

"Learning To Count" can easily be modified or enhanced with custom characters or several subroutines of graphics and sound displays as rewards for correct answers.

See program listings on page 147. 

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SIMPLE ANSWERS TO COMMON QUESTIONS

TOM R. HALFHILL
STAFF EDITOR

QA

Each month, COMPUTE!'s GAZETTE tackles some questions commonly asked by new VIC-20/Commodore 64 users and by people shopping for their first home computer.

Q. *I have a large collection of programs on cassette tape. Soon I'll be getting a disk drive. Is there any way I can transfer the programs from tape to disk?*

A. With BASIC programs, there's nothing to it. First switch on the computer and disk drive, then insert a formatted disk (see your manual). Next, LOAD the program from tape as usual. Now enter this command:

```
SAVE"0:filename",8 [press RETURN]
```

Look familiar? It's the same SAVE command you've been using to store programs on tape except for the numeral 0 and colon before the filename, and the comma and numeral 8 tacked onto the end. The numeral 8 is the disk drive's device number, and it tells the computer to route the data to the disk drive instead of the tape recorder. If you want, you can omit the 0:, but we recommend using it anyway for best results. (The 0: is a vestige from the days of the dual-slot 4040 drives for the Commodore PET computers.) The filename can be any title you wish for the program, up to 16 characters long, just like cassette filenames.

A similar variation of the LOAD command lets you retrieve programs from disk:

```
LOAD"filename",8
```

That takes care of BASIC programs. Unfortunately, transferring machine language programs from tape to disk isn't nearly so simple. Most commercial programs seize control of the computer and never let you leave the application to enter BASIC. Hence, you can't type in any SAVE commands. You'll have to be patient

and continue loading these programs from tape.

If the machine language program is one that you typed in from COMPUTE!'s GAZETTE using MLX, you're in luck. First, load your copy of MLX from tape as usual. When you run MLX, it asks for the starting and ending addresses of the program. To find these two numbers, refer back to the article which described the program. Next, press SHIFT-L to activate the MLX LOAD command. After loading the machine language program from tape, press SHIFT-S to activate the MLX SAVE command. Answer the prompt to save the program on disk. To be safe, save another copy on a backup disk.

Q. *Is there any company which makes a steering wheel controller for the Commodore 64, like Coleco's steering wheel for its Turbo racing game? How would I go about getting one if there isn't one on the market? It doesn't have to be sold with a game, but maybe just by itself, like a joystick, so you can write your own programs for it.*

A. Although we don't know of any steering wheel controllers for the Commodore 64 or VIC-20, it's easy enough to simulate one.

At the heart of steering wheel controllers is a potentiometer (variable resistor). The potentiometer continuously returns a number to the computer which corresponds to the wheel's position. This happens to be exactly how a paddle controller works.

A Commodore paddle returns a 0 when it's turned completely to the left, and 255 when it's rotated completely to the right. Any intermediate position returns a number between 0 and 255. There's no room in this column for a detailed explanation, but briefly, your program must read these numbers from the joystick port and act accordingly. For example, if you're writing a program similar to Atari's *Pole Position*, in which the

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player steers a racing car along a road, your program could interpret 128 (the midpoint between 0 and 255) as the center position for the car. Any number less than 128 would steer the car to the left, and any number greater than 128 would move it to the right.

If you miss the feel of an actual steering wheel, it might be possible to somehow attach a toy wheel onto a paddle controller. But unless you're handy with tools, it would probably wind up looking pretty strange.

Another alternative is to find the steering wheel controller designed for the Atari 2600 VCS videogame machine. It has a standard Atari-type plug, so it should be compatible with a VIC or 64 joystick port. Since it returns values different from a Commodore paddle controller, you'll have to experiment with different routines to interpret the results properly for your computer. ☐

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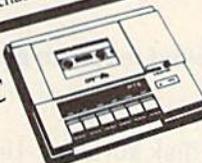
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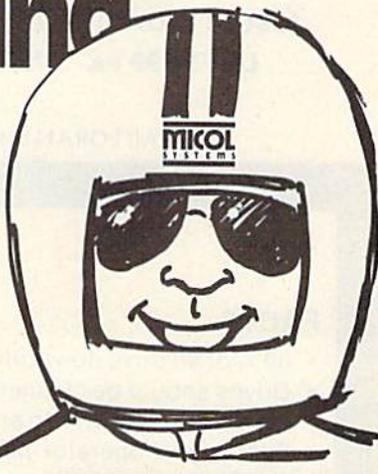
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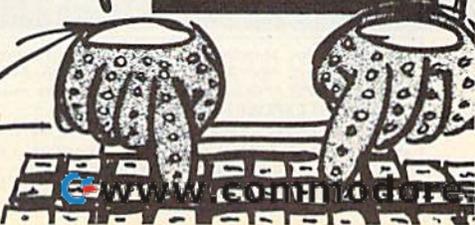
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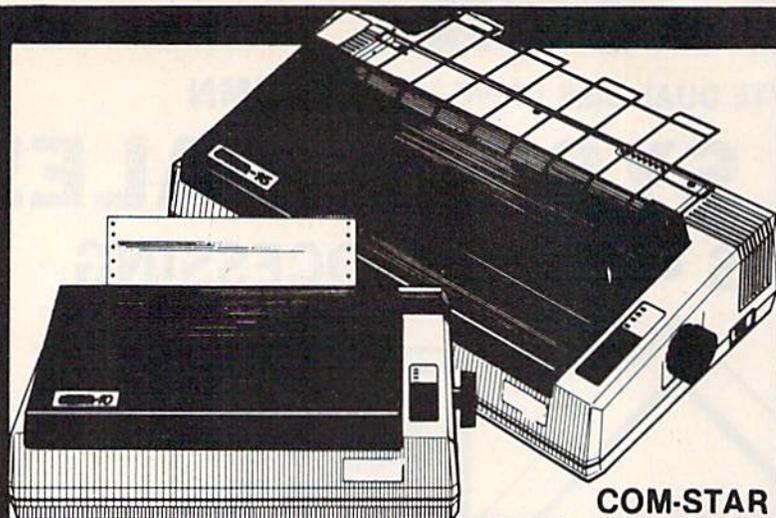
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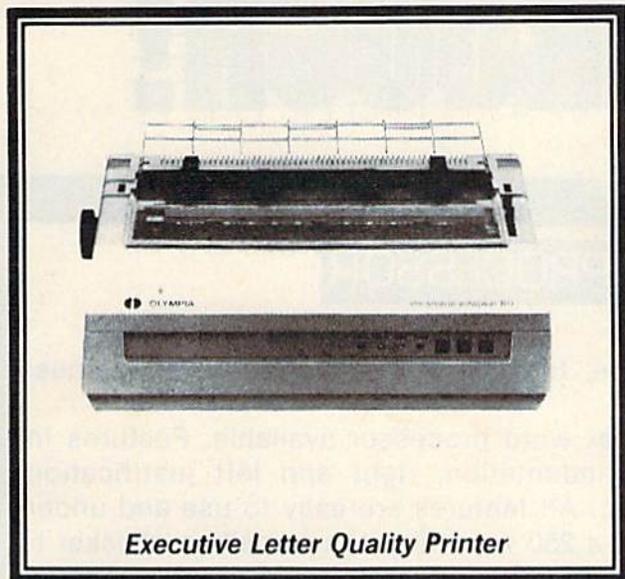
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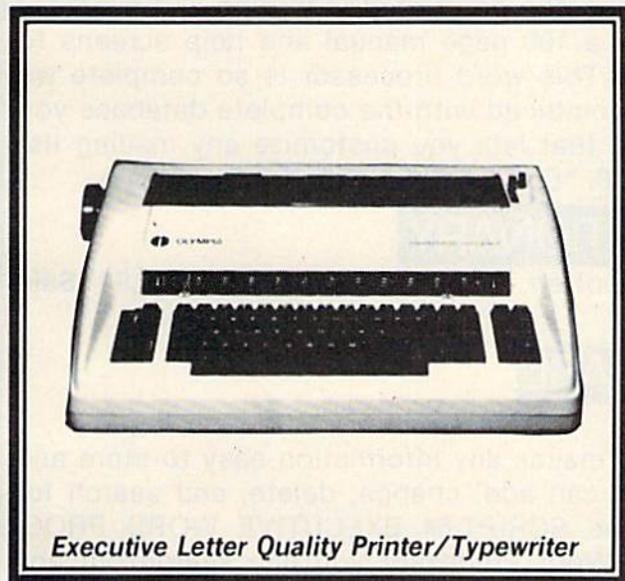
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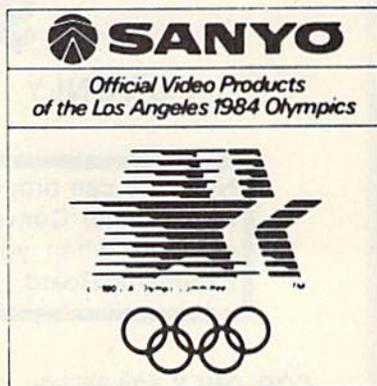
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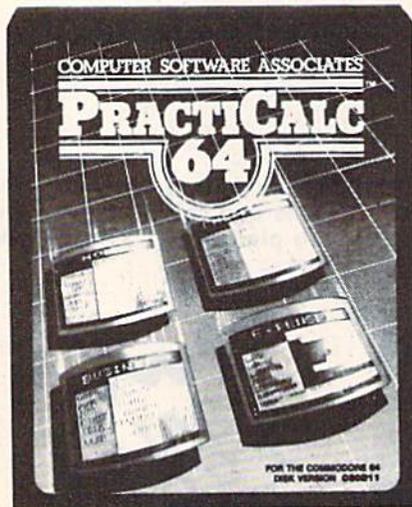
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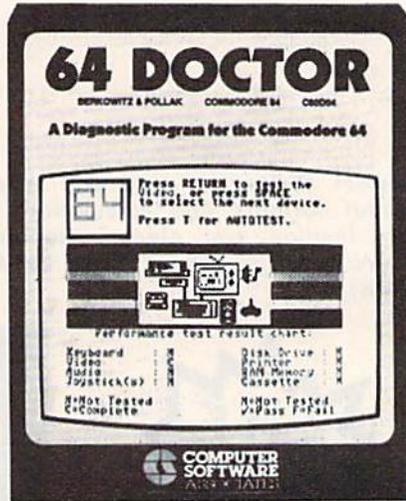
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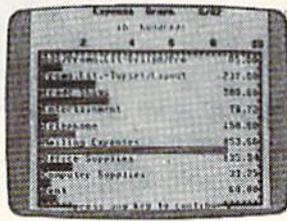
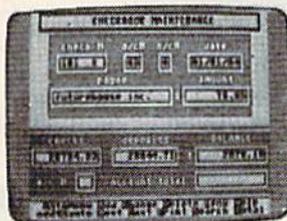
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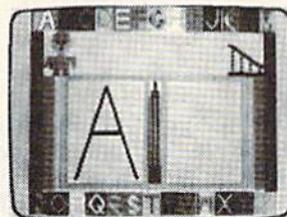
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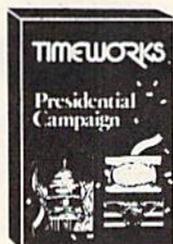
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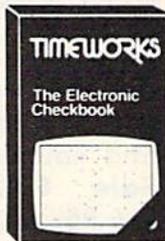
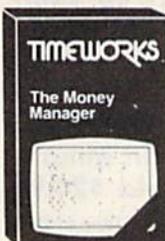
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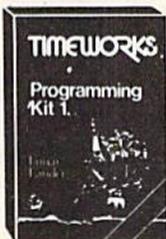
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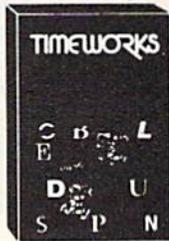
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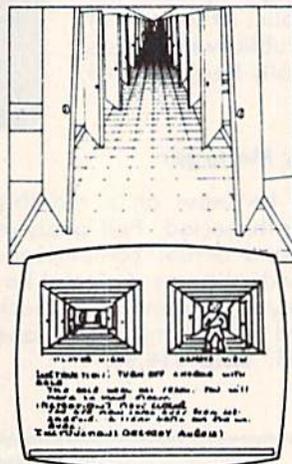
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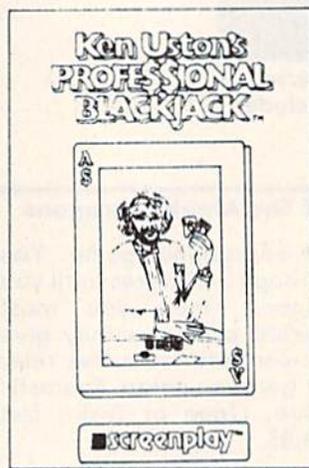
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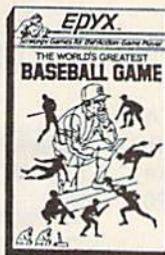
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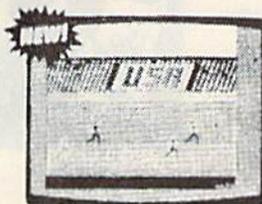
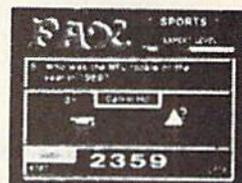
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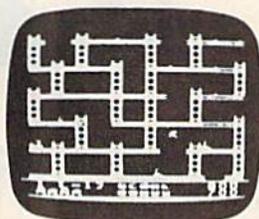
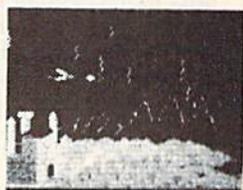
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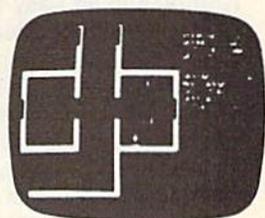
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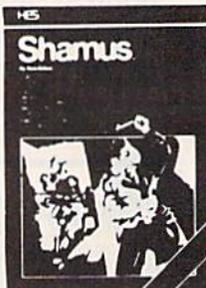
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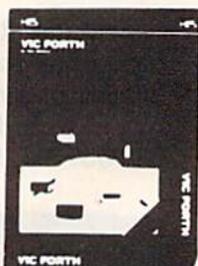
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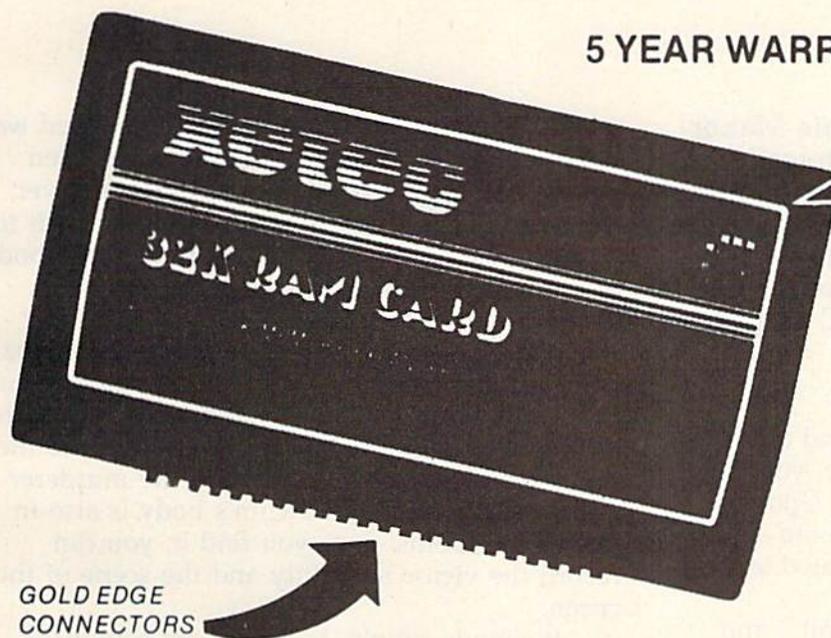
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Mystery At Marple Manor

John R. Prager

You've been summoned to Marple Manor on a dark and stormy night to investigate the unexpected demise of one of the dinner guests. Clues are everywhere, but can you discover who did it, to whom, how, and where? A mystery text-adventure for one to six players. Versions for the VIC and 64.

Searching through the study, you find a duelling pistol hidden under a cushion. Later, you discover the cook cowering in a closet. Upon unlocking the greenhouse door, you are aghast to find the body of the Duchess concealed among the potted ferns.

Your job is to find out "whodunit," and how, before the other detectives crack the case. They are a shifty lot, who might hide vital clues or steal pieces of evidence you are carrying, just to throw you off the track. There are over 15,000 possible solutions, but only one correct answer, chosen anew each time the program is run. It's a race against your fellow sleuths to find that unique answer.

"Mystery At Marple Manor" may be a departure from the computer games you're used to playing. Patient strategy, rather than quick reflexes, is of paramount importance to the successful detective. In many ways, the game resembles computer text-adventure games as well as familiar board games of logic and deduction.

For Sleuths Only

In order to solve the case, you must correctly identify the murderer, the victim, the weapon

used, and the room where the heinous deed was done. Before you arrived, the manor held ten people and twelve possible weapons; however, the murderer has fled to parts unknown with the weapon he or she used, leaving behind the body of the victim, eight living suspects, and only eleven weapons.

As you travel through the mansion, use paper and pencil to keep a careful record of all suspects and weapons you see. When you've located all the objects that remain in the house, use the process of elimination to identify the murderer and weapon used. The victim's body is also in one of the rooms; once you find it, you can record the victim's identity and the scene of the crime.

It sounds simple, but there are complications. At the outset, many of the suspects and weapons will be hidden in the various nooks and crannies of the manor. Players may have to search each room thoroughly, possibly several times, before all the concealed items are discovered. The detectives can even pick up and move items from room to room in the course of play. Suspects and the body of the victim cannot be moved, but, in the 64 version (Program 1), they can be hidden by detectives in the same room.

Marple Manor is a house of 14 rooms. To better assist you while maneuvering through the manor, refer to the floorplan with this article. Up to six people can play, and all players begin the game in the entry foyer at the southern end of the house. They alternate turns until either one player correctly solves the mystery, or until all players have made incorrect guesses and, consequently, have been eliminated from the game.

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Dear Pepper.

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You're right. This VIP Terminal is the only terminal for the C64 worth owning. That freebie software that came with my modem just didn't work, especially with my new smartmodem. The 80 column display alone was well worth the \$49.95 — much less the 40, 64 and 106 character displays — and it doesn't need any hardware changes. Imagine 106 characters on 25 lines. Heck, there's more text on my screen than on my uncle's Apple or my dad's IBM-PC!

I put auto-dial to work right away. I auto-dialed CompuServe, but couldn't get through, so I had VIP Terminal redial 'til it got through — it dialed five minutes straight! Then I auto-logged on with one of my 20 programmed keys, and downloaded some graphics screens, and stock quotes for dad. I printed it and saved it to disk as it came on the screen. Wow! And now I can send you my programs automatically. I got yours and they worked right off.

Those icons — you know, like the Apple Lisa — are a lot of fun. I also like the menus, function keys, highlights, help tables — great for a newcomer like me. And with the many options there isn't a computer I can't talk to.

What's really neat is that Softlaw has a whole VIP Library of interactive programs, including a word processor, spreadsheet and database, which will be out soon. Sis promised me the whole set for my birthday.

I see by the built-in "old clock" on the screen that long-distance rates are down. Got to call that L.A. BBS. Yep, there goes the alarm. Later.

- Lone

They're right! To start with the best you've got to have the **VIP Terminal!**

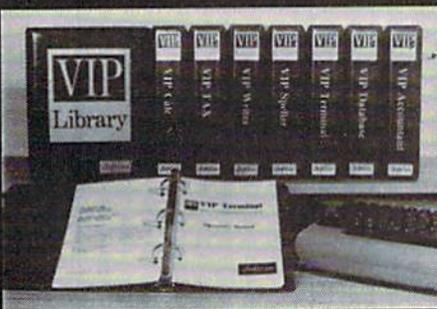
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Who Is Softlaw?

Softlaw Corporation has years of software experience in micros. We currently offer the full-line **VIP Library** for other micros in the U.S. and in Europe. Now we are bringing this experience to the Commodore 64 so you get ultra-high quality software at very affordable prices.

SoftLaw

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Although each player takes a separate turn, the game works just as well if the players form teams of equal size. This allows two or three teammates to travel through the house independently, yet share their discoveries and arrive at a solution together.

Passwords And Locked Doors

In the 64 version, the game begins with a title screen and a thunderclap. This gives contestants time to assign player numbers, organize teams (if desired), and ready their notepads. Type a number from 1 to 6 to enter the number of players, and the game begins.

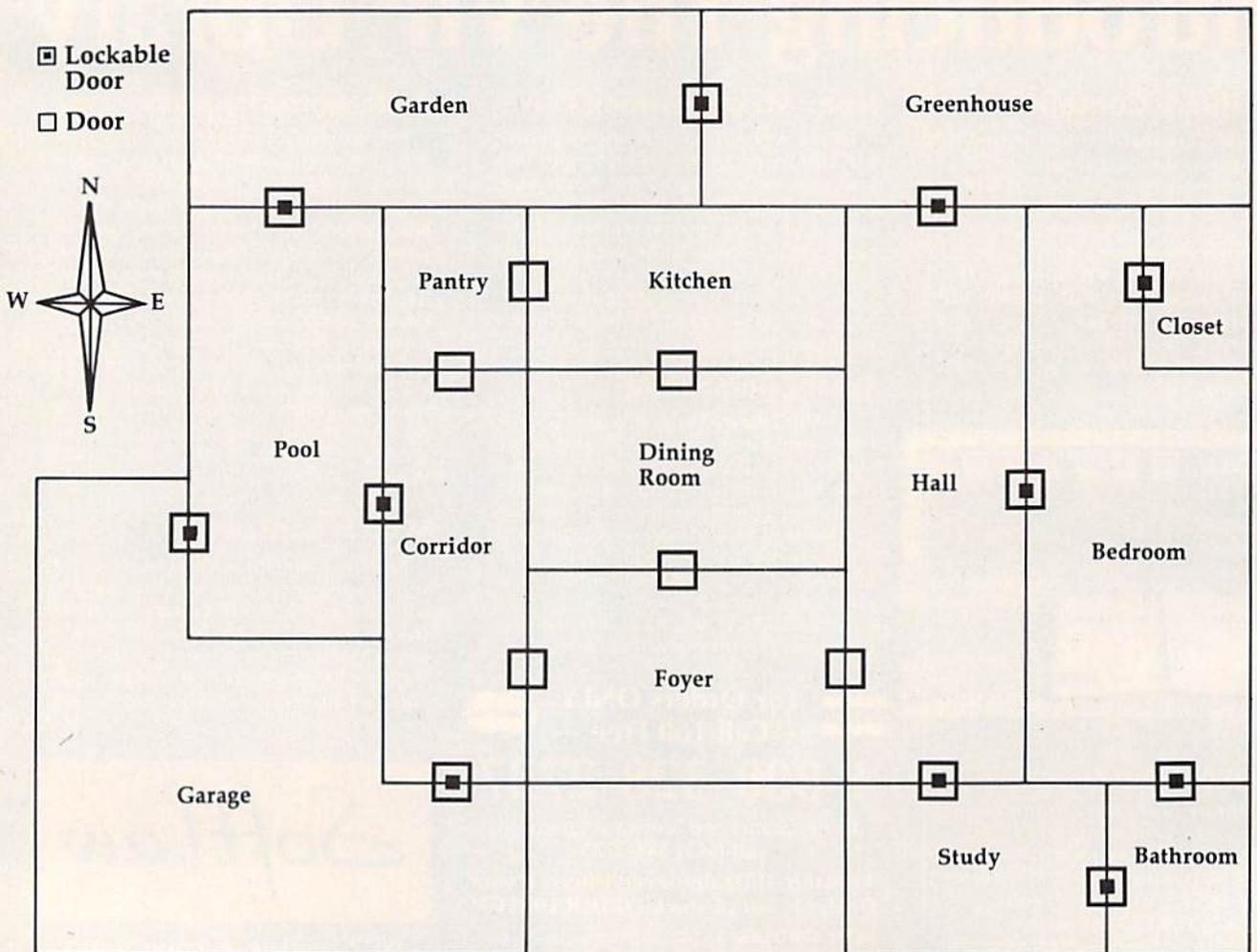
At this point, all players except the first should position themselves so they can't see the screen. After all, each player will be acquiring information in the course of the game that he or she wishes to keep secret from the others for as long as possible. To help preserve secrecy, you will be asked to enter a secret code on your first turn. This password can be any two characters

from the keyboard—numerals, letters, spaces, special symbols, or even function keys. Be sure to choose a code that you can recall easily, and bear in mind that the computer will recognize shifted keys and unshifted keys as different entries. On later turns, you must enter your secret code before going on. This prevents other players from illegally using your turn to gather information for themselves.

After you type in your code, the computer reminds you of your current location and asks if you wish to move. If you answer yes, the computer lists all possible exits available to you. Type in the appropriate compass direction to move to a new room: N, S, E, or W. If you type in a direction that does not have a matching door—for example, if you try to move south from the foyer—your move will be blocked.

Your move may also be blocked if you attempt to move through a locked door. Eleven doors in Marple Manor can be fastened shut, and, at the start of the game, most of these doors

Floorplan Of Marple Manor



are locked. (See the floorplan diagram.) To move through a locked door, you must possess a key which matches the lock; for example, the bedroom key will open any door that adjoins the bedroom. All of these keys are initially placed in the pantry. One special key, the skeleton key, can open any locked door but is powerless to lock doors; its starting location will vary from game to game.

Whether or not you move to a new room, the computer describes your surroundings. It tells you the room you are in; notes what item you carry, if any; lists all suspects, weapons, and keys in view; and names all the other players in the room.

Searching For Clues

Following the description, you are presented with a list of choices. Select from these options by pressing the appropriate key. One option is to take no action; this allows you to end your turn and readies the computer for the next player.

Searching is the most popular option. At the start of play, many suspects and items are hidden in various rooms. Additionally, players may use the *Hide* option to stow away even more clues. Searching is the only way to find these hidden objects. Each time a player searches in a given room, there is a 50% chance of finding each item hidden in that area. For this reason, a room may be searched several times before all the objects it contains are revealed. A searching player does not automatically take any item he finds.

The *Hide* option is the logical counterpart to the *Search*. You may choose to hide any one object in the room you occupy. This object may be a weapon, a suspect, a key, or the corpse. You may even hide the object you carry, if any. But you can't hide yourself or another player. Hiding items makes it more difficult for your opponents to locate the clues they need in order to win. Don't forget, of course, to record each clue in your notes before you hide it. Hidden objects may be discovered subsequently by any player searching in the room.

The *Take* option allows you to pick up a weapon or key in the room you occupy. You may only carry one item at any time. If you choose the *Take* option while holding an object, you automatically drop the article currently held in favor of the new one. Alternatively, the *Drop* option allows you to discard an item without taking another. The usefulness of the *Take* option cannot be overstated: Carrying keys allows you to pass through locked doors, while weapons in your possession cannot be discovered by players who search. However, the *Pilfer* option allows a player to steal from another player in the same

room. The pilfering player drops any item carried, and receives the object the other player had held.

When you are certain you have the solution to the case, select the *Accuse* option. You will be asked to identify the murderer, the victim, the weapon, and the scene of the crime from lists of the possibilities. An incorrect guess eliminates you from further play. Give the correct solution, though, and you win the game.

VIC Version Notes

Gameplay for the VIC-20 version (Program 2) varies somewhat from the preceding description. Sound effects have been deleted from the game, and the introductory title and prompts throughout the game have been streamlined. Secret codes are not used. There are no keys or lockable doors; investigators may pass freely from one room to another in the manor. Finally, the *Hide* option has been removed, and the effectiveness of searching is increased to 60%. Even with these extensive modifications, less than 100 bytes of free memory remain when the program is running, so be sure not to add any spaces as you type in the program.

The net effect of these changes is to increase player interaction. It still retains the flavor and excitement of the larger version. Since players cannot hide objects in this version, and since there is no need to carry keys, players use the *Take* option to acquire weapons. Consequently, pilfering is more frequent in this version of the game, and more often useful to the player choosing that option.

If you wish to avoid typing in the entire listing, I'll make a copy of either version for you. Send \$3 and a blank disk, (sorry, no tapes) in a stamped, self-addressed disk mailer to:

John R. Prager
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Bay City, MI 48706

Be sure to specify whether you want the 64 or VIC version.

See program listings on page 154. ☐

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A Beginner's Guide To Typing In Programs

What Is A Program?

A computer cannot perform any task by itself. Like a car without gas, a computer has *potential*, but without a program, it isn't going anywhere. Most of the programs published in *COMPUTE!'s GAZETTE* for Commodore are written in a computer language called BASIC. BASIC is easy to learn and is built into all VIC-20s and Commodore 64s.

BASIC Programs

Each month, *COMPUTE!'s GAZETTE* for Commodore publishes programs for both the VIC and 64. To start out, type in only programs written for your machine, e.g., "VIC Version" if you have a VIC-20. Later, when you gain experience with your computer's BASIC, you can try typing in and converting certain programs from another computer to yours.

Computers can be picky. Unlike the English language, which is full of ambiguities, BASIC usually has only one "right way" of stating something. Every letter, character, or number is significant. A common mistake is substituting a letter such as O for the numeral 0, a lowercase l for the numeral 1, or an uppercase B for the numeral 8. Also, you must enter all punctuation such as colons and commas just as they appear in the magazine. Spacing can be important. To be safe, type in the listings *exactly* as they appear.

Braces And Special Characters

The exception to this typing rule is when you see the braces, such as "{DOWN}". Anything within a set of braces is a special character or characters that cannot easily be listed on a printer. When you come across such a special statement, refer to "How To Type In *COMPUTE!'s GAZETTE* Programs."

About DATA Statements

Some programs contain a section or sections of DATA statements. These lines provide information needed by the program. Some DATA statements contain actual programs (called machine language); others contain graphics codes. These lines are especially sensitive to errors.

If a single number in any one DATA statement is mistyped, your machine could "lock up," or "crash." The keyboard and STOP key may seem "dead," and the screen may go blank. Don't panic — no damage is done. To regain control, you have

to turn off your computer, then turn it back on. This will erase whatever program was in memory, so *always SAVE a copy of your program before you RUN it*. If your computer crashes, you can LOAD the program and look for your mistake.

Sometimes a mistyped DATA statement will cause an error message when the program is RUN. The error message may refer to the program line that READS the data. *The error is still in the DATA statements, though.*

Get To Know Your Machine

You should familiarize yourself with your computer before attempting to type in a program. Learn the statements you use to store and retrieve programs from tape or disk. You'll want to save a copy of your program, so that you won't have to type it in every time you want to use it. Learn to use your machine's editing functions. How do you change a line if you made a mistake? You can always retype the line, but you at least need to know how to backspace. Do you know how to enter inverse video, lowercase, and control characters? It's all explained in your computer's manuals.

A Quick Review

1. Type in the program a line at a time, in order. Press RETURN at the end of each line. Use backspace or the back arrow to correct mistakes.
2. Check the line you've typed against the line in the magazine. You can check the entire program again if you get an error when you RUN the program.
3. Make sure you've entered statements in braces as the appropriate control key (see "How To Type *COMPUTE!'s GAZETTE* Programs" elsewhere in the magazine).

*We regret that we are not able to respond to individual inquiries about programs, products, or services appearing in *COMPUTE!'s GAZETTE* for Commodore due to increasing publication activity. On those infrequent occasions when a published program contains a typo, the correction will appear in the magazine, usually within eight weeks. If you have specific questions about items or programs which you've seen in *COMPUTE!'s GAZETTE* for Commodore, please send them to Gazette Feedback, P.O. Box 5406, Greensboro, NC 27403.*

How To Type In COMPUTE!'s GAZETTE Programs

Many of the programs which are listed in COMPUTE!'s GAZETTE contain special control characters (cursor control, color keys, inverse video, etc.). To make it easy to know exactly what to type when entering one of these programs into your computer, we have established the following listing conventions.

Generally, any VIC-20 or Commodore 64 program listings will contain words within braces which spell out any special characters: {DOWN} would mean to press the cursor down key. {5 SPACES} would mean to press the space bar five times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing the other key), the key would be underlined in our listings. For example, S would mean to type the S key while holding the shift key. This would appear on your screen as a 'heart' symbol. If you find an underlined key enclosed in braces (e.g., {10 N}), you should type the key as many times as indicated (in our example, you would enter ten shifted N's).

If a key is enclosed in special brackets, {k}, you should hold down the Commodore key while pressing the key inside the special brackets. (The Commodore key is the key in the lower left corner of the keyboard.) Again, if the key is preceded by a number, you should press the key as many times as necessary.

Rarely, you'll see a solitary letter of the alphabet enclosed in braces. These characters can be entered on the Commodore 64 by holding down

the CTRL key while typing the letter in the braces. For example, {A} would indicate that you should press CTRL-A. You should never have to enter such a character on the VIC-20, but if you do, you would have to leave the quote mode (press RETURN and cursor back up to the position where the control character should go), press CTRL-9 (RVS ON), the letter in braces, and then CTRL-0 (RVS OFF).

About the *quote mode*: You know that you can move the cursor around the screen with the CRSR keys. Sometimes a programmer will want to move the cursor under program control. That's why you see all the {LEFT}'s, {HOME}'s, and {BLU}'s in our programs. The only way the computer can tell the difference between direct and programmed cursor control is the quote mode.

Once you press the quote (the double quote, SHIFT-2), you are in the quote mode. If you type something and then try to change it by moving the cursor left, you'll only get a bunch of reverse-video lines. These are the symbols for cursor left. The only editing key that isn't programmable is the DEL key; you can still use DEL to back up and edit the line. Once you type another quote, you are out of quote mode.

You also go into quote mode when you IN-SerT spaces into a line. In any case, the easiest way to get out of quote mode is to just press RETURN. You'll then be out of quote mode and you can cursor up to the mistyped line and fix it.

Use the following table when entering cursor and color control keys:

When You Read:	Press:	See:	When You Read:	Press:	See:	When You Read:	Press:	See:
{CLR}	SHIFT CLR/HOME		{CYN}	CTRL 4		{7}	CTRL 7	
{HOME}	CLR/HOME		{PUR}	CTRL 5		{8}	CTRL 8	
{UP}	SHIFT CRSR ↑		{GRN}	CTRL 6		{F1}		
{DOWN}	CRSR ↓		{BLU}	CTRL 7		{F2}	SHIFT F2	
{LEFT}	SHIFT CRSR ←		{YEL}	CTRL 8		{F3}		
{RIGHT}	CRSR →		{1}	CTRL 1		{F4}	SHIFT F4	
{RVS}	CTRL 9		{2}	CTRL 2		{F5}		
{OFF}	CTRL 0		{3}	CTRL 3		{F6}	SHIFT F6	
{BLK}	CTRL 1		{4}	CTRL 4		{F7}		
{WHT}	CTRL 2		{5}	CTRL 5		{F8}	SHIFT F8	
{RED}	CTRL 3		{6}	CTRL 6				

Treasure Hunt

Calvin Overhulser

"Treasure Hunt" is a joystick-controlled action game originally written for the VIC-20 with at least 3K of expanded memory. An easy technique is also included to RUN the program with an 8K or larger expander. We've added a version for the 64.

Your goal in "Treasure Hunt" is to collect lost pirate treasure on a secluded island while avoiding a variety of obstacles. The treasure includes gold coins, gold bars, and a treasure chest. The obstacles are rum kegs, quicksand bogs, and spirits of ancient pirates (which appear as skulls), any of which can spell disaster for a treasure hunter. When most of the gold coins and gold bars are collected (you are allowed to leave one gold coin and/or one gold bar), you get a new screen.

You don't have to pick up the treasure chest but you earn more points if you do; just remember to hold the fire button down while attempting to cross the bog. The round number and the current score are displayed as the game progresses.

There are five skill levels. The level you choose determines the number of fixed and moving obstacles. The skill level also determines the points earned for each treasure collected.

VIC Program Construction

The main loop is in lines 65-90. The subroutines at lines 91-98 are used to update the location of both the treasure hunter and the moving obstacles (skulls). In line 70 for the treasure hunter and in line 610 for the active skull, ON-GOSUB allows the new location for either to be calculated using the same subroutines.

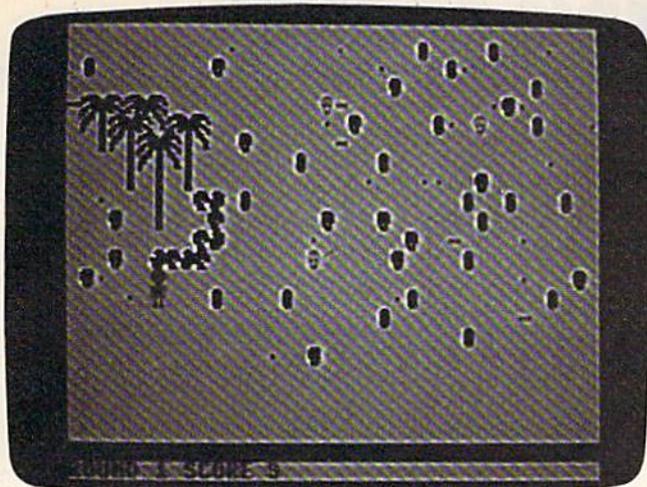
The machine language joystick routine is contained in the DATA statements in lines 6035-6055. The routine is READ and POKEd into the cassette buffer by line 35. The SYS in line 65 calls the machine language routine which puts the joystick condition in address 830 and the fire button condition in address 831.

Line 605 randomly selects which of the skulls will move. Only one can move for each move of the treasure hunter; if all were moved, the game would slow down considerably.

Line 30 moves part of the VIC character set (screen codes 0-63) into RAM addresses 7168-7679. The custom character information is contained in the DATA statements in lines 6060-6090, and is READ and POKEd into the place of some of the VIC's relocated characters by lines 40 and 41. This table shows which characters are replaced with custom characters.

Custom Characters In Treasure Hunt

Screen Code	Original Character	Custom Character
35	#	border and tree trunk
36	\$	palm leaves
37	%	palm leaves
38	&	palm leaves
39	'	palm leaves
40	(palm leaves
41)	palm leaves
42	+	skull
43	+	bog
44	,	bog
45	-	rum keg
46	.	top of treasure hunter
47	/	bottom of treasure hunter
58	:	treasure chest, left
59	;	treasure chest, right
60	<	gold coin
61	=	gold bar



The treasure hunter has collected most of the gold from the bottom of the screen (64 version).



Grab the treasure chest and you score 200 points (VIC version).

VIC Program Variables

Program Variables

A	variable in READ statements
B	variable for screen code for gold coins and gold bars
D	random numbers
I	miscellaneous counters in FOR/NEXT loops and random numbers
N	counter in FOR/NEXT loops
P	constant = 1
Q	constant = 22
V	volume (36878)
X	counter in FOR/NEXT loops and random numbers
Z	current location to be updated in subroutines 91-98
AA	skill level
AS	string for GET statements
CL	current location for treasure hunter's head
CM	difference between color memory and screen memory
CH-CI-CJ	address of screen locations for treasure chest
DF	dead flag
FG	flag for treasure chest already picked up
FL	flag for repeat stagger
GB	gold bars remaining
GC	gold coins remaining
RN	number of current round
SC	current score
SH	sound high (36876)
SL	sound low (36875)
SK	location of current active skull
S1-S5	locations of moving skulls
TB	random tab value for placing palm grove
TL	temporary storage for CL during update
TS	temporary storage for SK during update

A Change For Expanders

If you have a VIC, you must use a memory expander. The program was designed to run with any size memory expander, but to LOAD and RUN it on a VIC with an 8K or greater expander, a single-line keyboard entry must be made before LOADING the program. If you are using a 64 or a VIC with the 3K expander, you can skip

over this part since the program will LOAD and RUN without special intervention.

When you add 8K or more to the VIC, screen and color memory and start of BASIC are moved to new memory locations. The idea is to put them back to their default locations before LOADING the program. Start of BASIC must be changed to address 8192, to prevent interference with screen memory. To set your VIC to run Treasure Hunt with the 8K expander in place, type the following line and press RETURN:

```
POKE648,30:SYS58648:POKE642,32:SYS58232
```

Your VIC will now load and run many programs written for the unexpanded or 3K-expanded VIC.

Typing In Treasure Hunt

The VIC version is about 6000 bytes long. *Don't add any spaces*; there are only 47 bytes free at some points during program execution.

If you do run out of memory, try deleting some of the instructions in lines 800-880. Make sure you SAVE the program before you run it. With such a long program, I usually save my work every half hour. If you don't want to type it in, I will make copies of the VIC version *only*. Send a tape, a self-addressed stamped mailer, and \$3 to:

Calvin Overhulser
P.O. Box 494
Westford, MA 01886

See program listings on page 166. ●

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THE BEGINNER'S CORNER

C. Regena

A Simplified Inventory

If you asked ten different programmers to write an inventory program, you'd probably get ten different approaches. There are many ways to accomplish such a task, depending on how much information you need to keep track of. This month, we'll take a simplified approach using DATA statements, and then we'll see how to customize the program.

This inventory program simply prints a list of items with a little information about each one, including its cost. After printing the list, the costs are added up. You can print the whole list, or you can print just a certain category. The amount of information you can store will depend on the capacity of your computer because all the information is stored right in the program in DATA statements.

The READ-DATA Connection

First let's review DATA statements, which are always associated with a READ statement. The READ statement picks up a number or string from the DATA statement and assigns it to a variable name. I like to think of the DATA-READ system as an alternative to the LET or direct definition system. One way of assigning values to variables is:

```
100 A=10
110 B=7
120 C=3
130 D=5
140 E=13
150 F=25
```

Another way is:

```
100 READ A,B,C,D,E,F
110 DATA 10,7,3,5,13,25
```

This second method may be harder to understand and harder to debug if there's a problem, but it usually saves memory and often simplifies programming.

In the second method, line 100 first says to read a number for A from the first DATA state-

ment you come to. The value is 10, so A will equal 10. Next a value for B is read and assigned; B=7. The process continues. You need to make sure your numbers are in the right order in the DATA statement and that you have enough numbers to satisfy the READ statement. Your DATA statement may be as long as the longest line the computer allows (88 characters for the VIC, 80 for the 64). The READ statement reads only the numbers it needs and ignores the rest. If the computer encounters another READ statement later, the computer starts with the very next data item that hasn't been used.

Quite often you will see a READ statement in a loop:

```
100 FOR I=1 TO 4
110 READ NAME$,AGE
120 PRINT NAME$,AGE
130 NEXT I
140 DATA MARCIE,18,JEFFREY,16,BRIAN,11
150 DATA MIKE,13
```

The elements in the DATA statements need to be in the right order so the data is read correctly and in the right order, but the DATA statement lines can be placed anywhere in the program. Lines 140 and 150 above could be lines 90 and 95, for example. As the computer goes through the program, it ignores the DATA statements until it hits a READ statement. A pointer helps the computer keep track of where it is in the DATA statements, so it knows which is the next item to be read. In the sample above, the first time through the loop, line 110 will assign MARCIE to NAME\$ and 18 to AGE. The next time through the loop, JEFFREY and 16 will be read, and so on. By the way, you have to be very careful typing the DATA statements so the values will match up with the READ statements. For example, if you skipped "16" in line 140 and just typed

```
140 DATA MARCIE,18,JEFFREY,BRIAN,11
```

the computer will stop with an error message be-

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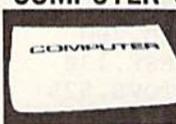
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cause it will try to read a numeric variable (AGE) in the second loop and get a string (BRIAN) instead.

You may divide up the DATA statements in any way that is convenient for you to type. Lines 140 and 150 above could be combined into one statement. Or you could end line 140 with BRIAN and start line 150 with 11. The main thing to remember is to keep the data items in order. If you have a full program, you can save some memory by typing as much as you can in each DATA statement, although it may be harder to understand.

Inventing An Inventory Program

In the previous example we printed names and ages. An inventory program can be very similar. Let's say we want to print a house inventory and list furniture and appliances and their costs. The READ statement reads ITEM\$ and C for cost (you cannot use COST because that name contains the BASIC word COS for cosine). After you READ the information from data, you PRINT ITEM\$,C and there is a list. The DATA statements would look like this:

```
320 DATA BED,200
330 DATA DESK,130
340 DATA STOVE,525
```

With the general idea of reading items from data and printing them, you can write a simplified inventory program. In the previous name and age sample, we used a loop and read four names and ages. In our inventory program we may not know how many items we have—or we may want to update our program periodically and not always have to figure out a new value for the FOR-NEXT loop. The solution is to have our last data item be a "dummy" item to signal the end.

```
100 READ ITEM$,C
110 IF ITEM$="ZZZ" THEN 500
120 PRINT ITEM$,C
130 GOTO 100
320 DATA BED,200
330 DATA DESK,130
340 DATA STOVE,525
350 DATA ZZZ,0
500 END
```

If you want to calculate a total cost as you are printing the list, initialize a total before line 100, say T, to be zero, then add line 125 T=T+C, and then at line 500 print the total cost T.

Add a title and make an attractive format, and you have an inventory program. You may want to add a few more columns in the program for other information, such as the date purchased

and replacement value.

The "Household Inventory" program included here adds a code item—a room number or category—so that you can print out one room at a time or the whole list. First I numbered the rooms—I just used an example; you will need to adapt the list of rooms for your own house. Lines 20-50 READ from DATA the names of the rooms and assign the numbers. R\$(1) will be the living room, R\$(2) will be the kitchen, R\$(3) will be bedrooms, and so forth for nine categories.

In each DATA statement I first put the room code, then the item, then the cost. For example, line 350 has room code 8, the item is a computer, and the cost is \$300. The DATA statement is:

```
350 DATA 8,COMPUTER,300
```

Lines 470 and 480 list televisions: One is in the computer room (8) and the other is in the family room (6).

You can arrange the DATA statements the way you want. I considered how the list would look if I printed all the items, and I arranged the items alphabetically. You may prefer to list the items by room and perhaps by physical position in the room.

Lines 60-100 print a title screen and offer a choice of rooms or zero to print the complete list. Line 110 gets the user's choice. If the user presses 0, the whole list will be printed, but if a room number is chosen, only the items referenced by that code number will be printed. The logic for this selection is in lines 180-200. Line 170 READs the room code, the item, and the cost. The user's choice is A and is compared to the room code for printing. TT keeps track of the total cost. C\$ and TAB (20 - LEN(C\$)) are used to line up the numbers in the cost column.

An option to print a different list is presented in lines 270-300. When we print a list, the computer starts at the top of the DATA list and goes all the way through the list, so if we choose the option to print another list, we need to RESTORE the data. RESTORE says to start the data pointer back with the very first DATA statement. Remember that in this program we first read in the names of nine rooms using DATA statements, so to get down to the data for the inventory items, line 160 simply reads those first nine items. Line 170 will then read the next data from line 320.

I've included a few items so you can see how the DATA system works for an inventory list and how you can choose categories or room numbers. The very last data item is 10,ZZZ,0. Line 170 READs the room, item, and cost, so you have to have three things in each of your DATA statements. Line 180 says if ROOM=10 then branch to line 250. I'm using 10 as the end-of-

data code. As you update your program, simply add DATA statements wherever you want among the existing statements. If you want to keep the list in alphabetical order, find where the item belongs and use a line number in-between. Just make sure that the last DATA statement is 10,ZZZ,0.

Modifications

If you understand how to use DATA statements for this simple inventory, let's explore them further. The "Computer Inventory" program lists a sample of computer equipment. In addition to the item and the cost, I wanted to include the serial number and the date of purchase. This time you can select two codes. Instead of room numbers, the first code represents the kind of computer: 1 for Commodore, 2 for Radio Shack, and 3 for Texas Instruments.

Within each brand of computer are some more categories: 1 for computers, 2 for peripherals, and 3 for software. Instead of just the 3 for software you may want to have different categories for games, programming languages, educational programs, utilities, etc.

You may also want to print a list of all your Commodore computers. You could press 1 for Commodore and 1 for computers. Only those data items starting with 1,1 will be printed. If you want a list of all the Radio Shack equipment and software, first press 2 for Radio Shack then 0 for everything. For the complete list, the selections would be 0 for everything (all kinds of computers) and 0 for everything of the second choice.

The DATA statements contain the following information in order: type of computer: 1, 2, or 3; type of item: 1, 2, or 3; item name; serial number; date of purchase; and original cost. An example is:

```
390 DATA 1,2,DATASSETTE,282754,1982,70
```

This item comes under Commodore equipment, it is a peripheral called a DATASSETTE, the serial number is 282754, it was purchased in 1982, and it cost \$70.

Notice that some of the data items do not have a serial number. You still need to list a data item in the DATA statement, but in this case simply type a comma following a comma. For example:

```
400 DATA 1,3,VICMON,,1982,60
```

We still have to have the right number of items in each DATA statement.

The very last DATA statement is 10,0,,,0; again, it has to have the right number of items. We'll be checking for 10 and the code to indicate the end of data. It really doesn't matter what the

rest of the DATA statement contains because we won't be using it, but we must include the right number of items to read.

The structure of this program is similar to Household Inventory. Lines 20-40 define the different categories and are used to print the titles of the lists selected. The selection process is done in two steps. First, lines 70-110 allow the user to select the kind of computer. Next, lines 120-160 allow the user to select the type of item. Line 190 prints the title of the list.

Line 200 RESTOREs the data so that each time a list is printed the computer starts at the top of the list of data items. Line 210 READs the two code numbers, then the item, serial number, date, and cost. Lines 220-260 determine if that is the last data item or if the item has the right code numbers for the category to be printed. Line 280 prints the item with its serial number, date, and cost. Lines 380-530 contain the sample data items.

Notice that this time the data items are not listed alphabetically by item. The list is arranged by computer, then within each type of computer category the computers are first, then the peripherals, then the software in alphabetical order. You may want to arrange your list differently—perhaps by date purchased, or perhaps in descending order of cost.

Customizing The Program

Again, you can adapt the DATA statements to your own needs. You may want to keep track of the date by month and year (such as 7/83) rather than just the year. You might want to list both the purchase price and a replacement cost. Or you might want to keep track of model numbers or catalog numbers. Perhaps you would also like to remember where the item was purchased.

If you have a printer, you might print out the information. (For a discussion on printouts, see last month's column.) Near the beginning of the program, use an OPEN statement to tell the computer to prepare for a printer. A statement such as OPEN 4,4 will open file 4 for the printer, which is device 4. Later in the program, use the regular PRINT statement to print something on the screen; but when you want to print on the printer use PRINT#4. Near the end of the program, when you're finished printing, you need to close the file. This can be done with PRINT#4:CLOSE4.

If you have a long list of items, you may want to add a section of code to prevent the list from scrolling off the top so you can't read it. There are several ways to do this. One is to use a line counter and increment the line counter each time a line is printed. When you have printed 20

or so lines, put in a delay loop or a routine to wait until the user presses a key before printing continues. Another method would be to use GET after each PRINT statement. If a key is pressed you temporarily stop the program until another key is pressed.

I didn't include any titles to the columns. For more readability, you should add column headings. You may need to adjust the printing—40 columns for the 64 and 22 columns for the VIC.

This DATA statement idea can be used for other types of lists as well. For example, you can keep a name and address file with this method. You can have several code columns—those who have a computer and those who don't; those who have children and those who don't; those who sent you Christmas greetings the previous year and those who didn't; business associates, neighbors, social friends, and relatives; and so forth. By the way, you don't have to use numbers for the codes. You could read C\$ for code and read in B for business, N for neighbor, F for friend, and R for relative, for example.

Your DATA statement can contain several codes, then the name, address, phone, birthday, or whatever information you want to keep. You can arrange the list alphabetically by name, geo-

graphically, or however you wish. This DATA system is really quite versatile. Once you have your main program working properly it is fairly easy to update by simply adding DATA statements.

One thing you have to remember is to SAVE your work each time you update the DATA statements. If you don't, all of the changes you made will be lost when the computer is turned off.

You probably have your own ideas now about how you can use DATA statements to organize information.

See program listings on page 151. 

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