

Controlling Your Home By Computer

# COMPUTE!

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The Leading Magazine Of Home, Educational, And Recreational Computing

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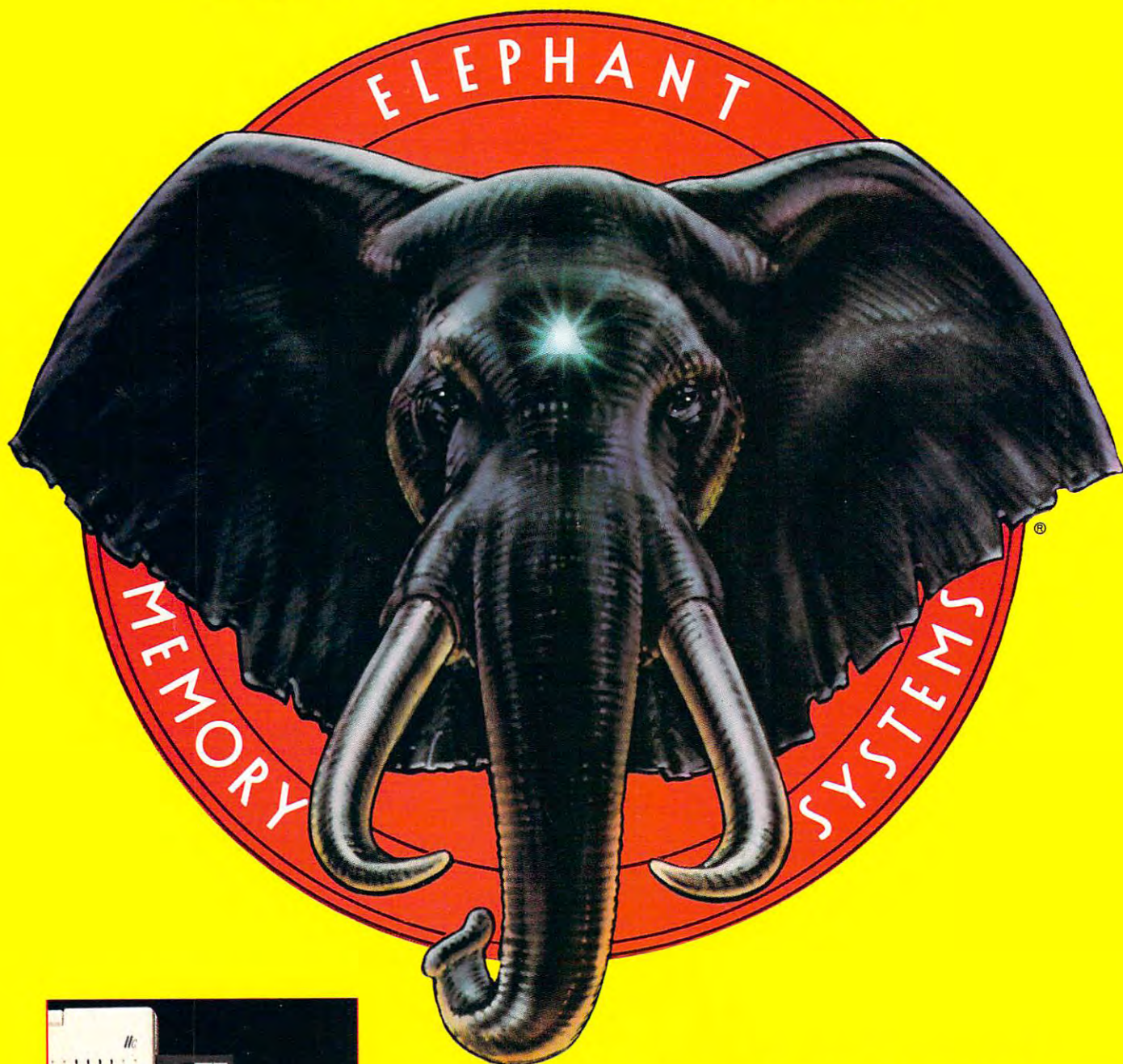
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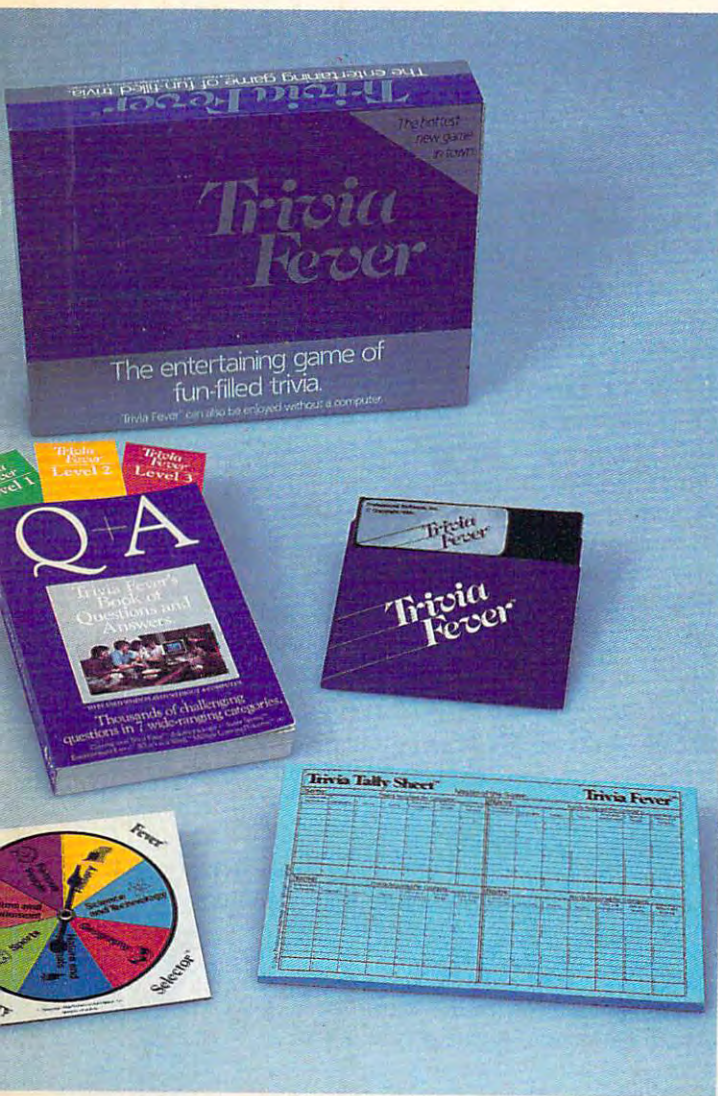
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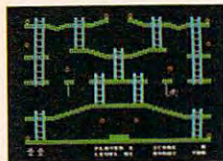
# Fun and games from IBM.

Just in time for the holidays, IBM presents a batch of entertaining software programs for every IBM personal computer (and every IBM personal computer person) on your gift list.

If it's pure fun and games you're after, or educational programs cleverly disguised as fun and games, you've come to the right ad. (If, on the other hand, your only interest is a spreadsheet or database manager, just remember what they say about all work and no play.)

Except for IBM PCjr ColorPaint, all the programs here cost less than \$50.\* And all are available through IBM Product Centers and authorized IBM Personal Computer dealers. For the location of the store nearest you, just call 1-800-447-4700. In Alaska or Hawaii, 1-800-447-0890.

## Arcade Games



### Jumpman™

You have to defuse hundreds of bombs to save the Jupiter Command Center, but be careful. The bad guys are shooting live ones. Requires color display or TV, joystick optional.

### Mine Shaft

You have a little problem. Floodwaters have short-circuited your robot miners, and now they're running berserk. PCjr only. Requires color display or TV, joystick optional.

### SHAMUS™

Find and eliminate the evil Shadow. 128 rooms and all manner of ill-mannered creatures stand between you and your goal. Requires color display or TV, joystick optional.



### Crossfire

The streets are crawling with giant spiders. Your city is counting on you. Good luck. PCjr only. Requires color display or TV, joystick optional.

## ScubaVenture

Dive for sunken treasure and live to tell about it. Maybe. PCjr only. Requires color display or TV, joystick optional.

## Adventure Games



### King's Quest

Save the Kingdom of Daventry from certain doom. An adventure game with advanced graphics, plus music and sound effects. PCjr only. Requires color display or TV.

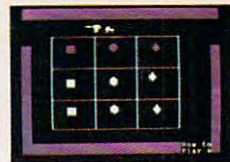
### Zyll

Explore the castle of a wicked sorcerer as a warrior, a wizard or a thief. A text adventure game for 1 or 2 players.

## Education Programs

### Gertrude's Secrets™

Progressively challenging games that stress logical thinking. Ages 4 to 10. Requires color display or TV.



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### Rocky's Boots™

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A music and drawing program that introduces the fundamentals of programming with Logo turtle graphics. Preschool and up. Requires color display or TV.



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Solve math problems and slay dragons. Or else. Requires color display or TV.

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Six colorful programs that teach children to plot number pairs, a basic math skill. Ages 4 to 10. Requires color display or TV.

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Reading and math for the uninitiated. Ages 3 to 6. Requires color display or TV.



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## Bumble Plot™

Geometry made fun. Yes, fun. Ages 8 to 13. Requires color display or TV.

## Serious Fun

### PC Pool Challenges

If you don't have room for a pool table, this is the next-best thing. 1 to 4 players. Requires color display or TV.

### Touchdown Football

Realistic football action. Call your own plays against an opponent or the computer as the crowd cheers you on. PCjr only. Requires either color display or TV, and joystick.

### Trivia 101: The Introductory Course

5,000 trivial questions in more than 200 trivial categories. Up to 14 players (or teams) compete against each other and the clock. Requires color display or TV.

### TV and Cinema 101: Trivia from Talkies to Trekkies

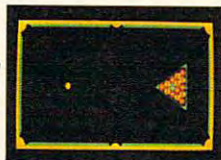
"What was the name of Pancho's horse on The Cisco Kid?" and 4,999 other infuriating questions. Requires color display or TV.

### Casino Games

Try your luck at blackjack, poker or the slot machines with \$500 in "computer" chips. 1 to 4 players. Requires color display or TV.

### Strategy Games

Computer versions of four popular board games: Checkers, Elusion, Battleship and Reversi. 1 or 2 players. Requires color display or TV.



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### Animation Creation

Create colorful moving pictures on your computer. No knowledge of programming necessary. Requires color display or TV.

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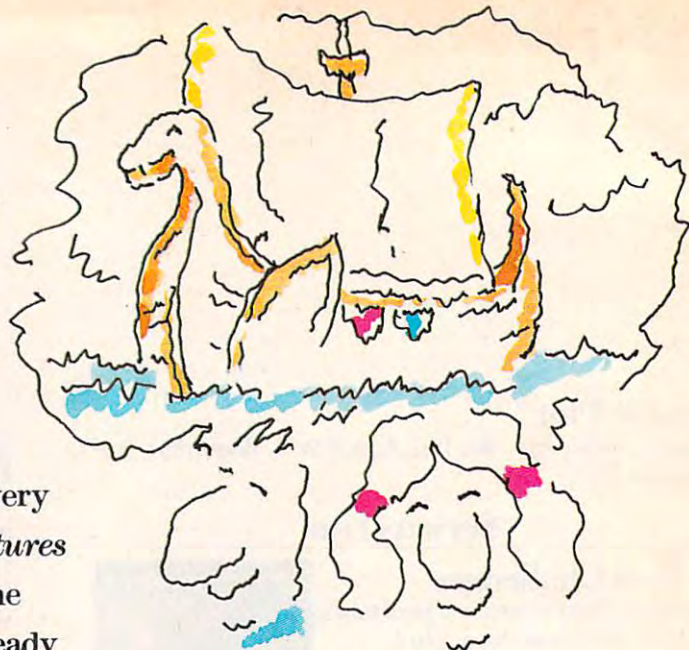
This is NOT a simulated picture.  
It's a real, live picture created  
with PCjr ColorPaint (see  
"Graphics Programs" above).





## A Nice Christmas Story

Christmas Day was approaching in the Nice household. But Mr. and Mrs. Nice (Bill and Janet) didn't know what to get for their Nice children, Tom and Marybeth. They thought and thought, but nothing seemed to hit them just right. "Hula hoops?" said Bill. "No," said Janet. ● Tom and Marybeth, on the other hand, knew exactly what they wanted. In fact, they dreamed of it almost every night: *DawnTreader*, the latest in the *Adventures In Narnia* computer game series based on the stories by C.S. Lewis. Tom and Marybeth already had the first game, *Narnia*, but now they dreamed about how they would captain the good ship Dawn Treader through the ocean to World's End. They dreamed about finding dufflepuds and sea serpents. And they knew that, just like *Narnia*, *DawnTreader* would be exciting, action-packed, and even educational, teaching them sound principles their Mom and Dad agreed with, too. But they wondered: would *DawnTreader* be under the tree come Christmas Morn? ● One day very close to Christmas, Bill and Janet Nice reached into the cupboard for *Narnia* (after all, it's a game *everyone* in the family can enjoy) and came across a note. It said, "We're dreaming of *DawnTreader*. Love, Tom and Marybeth."



- Finally, Bill and Janet had their answer. "It's perfect!" exclaimed Bill. "Let's get them the next Narnian adventure, *DawnTreader*!" "Oh Bill," sighed Janet, "What a nice idea!" ● It was. Wouldn't it be nice for your children, too?

**Merry Christmas from  
the Nice household to yours!**


*DawnTreader* is available at all Waldenbooks stores and computer specialty stores. All *Adventures In Narnia* games are compatible with Apple II series® and Commodore 64™ home computers.



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## FEATURES

- 30 Controlling Your Home By Computer ..... Sharon Darling  
39 Personal Finance Made Simple ..... Kathy Yakal  
48 MSX Is Coming, Part 1 ..... Tom R. Halfhill and Selby Bateman

## EDUCATION AND RECREATION

- 62 Things In The Dark ..... Scott Baker  
84 Chess ..... John Krause

## REVIEWS

- 135 *Enchanter* ..... Marc Berman  
138 Logo For The 64 ..... Andrew Keith  
142 *Microsoft Flight Simulator* For PC & PCjr ..... David Florance  
144 *DataPlus-PC* ..... Darryl G. Linkow

## COLUMNS AND DEPARTMENTS

- 6 The Editor's Notes ..... Robert Lock  
10 Readers' Feedback ..... The Editors and Readers of COMPUTE!  
105 The World Inside The Computer: Muppet Roundup ..... Fred D'Ignazio  
110 The Beginner's Page ..... Tom R. Halfhill  
146 Computers And Society: Of Cats, Kids And Computers ..... David D. Thornburg  
150 Telecomputing Today ..... Arlan R. Levitan  
154 Machine Language: A Simple Sort ..... Jim Butterfield  
162 IBM Personal Computing: Christmas Shopping For An IBM ..... Donald B. Trivette  
193 INSIGHT: Atari ..... Bill Wilkinson  
197 Programming The TI: Multiplication Maze ..... C. Regena

## THE JOURNAL

- 118 64 Paintbox ..... Chris Metcalf  
130 VIC Music Maker ..... Frank Colosimo  
159 Applesoft Searcher ..... Ian Reuben  
170 Conic Curve Plotter ..... Lam-hing Wong  
183 The Basics Of Commodore 64 Hi-Res Graphics ..... David Martin  
186 Atari's "Hidden" Character Modes ..... Sheldon Leemon  
189 IBM Personalized Form Letters ..... Donald B. Trivette

- 201 News & Products  
206 COMPUTE!'s Guide To Typing In Programs  
209 MLX Machine Language Entry Program For Commodore 64  
212 CAPUTE! Modifications Or Corrections To Previous Articles  
219 Product Mart  
220 Advertisers Index

NOTE: See page 206  
before typing in  
programs.

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# EDITOR'S NOTES

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Never in the five-year-plus history of COMPUTE! have I written an editorial that could be interpreted to be as self-laudatory as this one. My apologies in advance. I assure you the topic is worthwhile. In early 1980, a fellow named Michael Tomczyk approached me with a desire to get involved in this budding industry of ours. He wanted to begin learning the ropes and building contacts in the rapidly expanding personal computer market. I gave him some sample assignments which he carried out well, and we began a relationship that has lasted through the years.

For a variety of reasons, the above being the foremost, I was aware that "someday" Michael wanted to write a book on Commodore and Jack Tramiel. He was aware (given our history of expertise in Commodore-relevant areas) of our interest in publishing such a book. When Michael left Commodore this past summer, he began work in earnest on his long-dreamed-of book. And we began work in earnest on agreeing on a contract. Both were finished at almost the same time, and we put a task force of senior editorial staff, notably Richard Mansfield and Juanita Lewis, immediately to work on it.

The result is a just-released COMPUTE! book, *The Home Computer Wars*. It's an exciting, enticing chronology of Commodore, the home/personal computer industry, and the impact of Jack Tramiel. As a first-hand observer of the time frame

covered by the book, I can attest to its interest. It's also a well-written, well-edited book. I'll apologize again for such a syrupy editorial, but the book merits my comments. It is, after all, our first book division release in hardback, and our first non-applications book. We are quite pleased with it.

There seems to be some concern regarding the present state of the industry with all of the vendor and manufacturer consolidation that's presently occurring. Is the home/personal computer revolution over? Has the fad flagged? I think not. We argued some months ago that within any revolution there are companies that lead, companies that follow, companies that by age and evolution are "mature" growth companies, and companies that by different definition are "entrepreneurial" growth companies. It would seem to make sense that we've arrived at an evolutionary stage in our industry's development that's almost a pause to catch our collective breath. We're between buses. The dust is still settling from a rather massive industry shakeout that's been five years in the making; things have at last slowed down for a matter of months, and industry watchers are saying, "Ah-ha . . . that's it, I told you so . . . a fad."

Perhaps, instead, a better perspective would be that we're pausing between surges, and we fully expect this industry to again move rapidly ahead in the not too distant future. It might be sparked by a major coup on

the part of a single manufacturer; it might be sparked by a single piece of software, but the march will resume. Commodore's Amiga Lorraine is just around the corner, and many argue that it represents the same quantum leap in personal computing technology and features that the VIC-20 did only three years ago when the notion of a \$299 color and sound computer was hard to believe, never mind one selling for \$200 or even \$100. And not long before that, customers bought Apples because they wanted something, *anything*, that would run a revolutionary new program called VisiCalc.

So, we're confident we're not a fad, not a blip on a relatively minor time line in some future historian's textbook. Personal computing is here to stay, and we're sure of it. Until next time, enjoy your COMPUTE!.

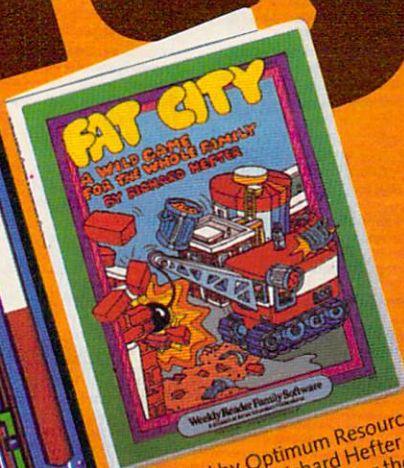


Editor In Chief



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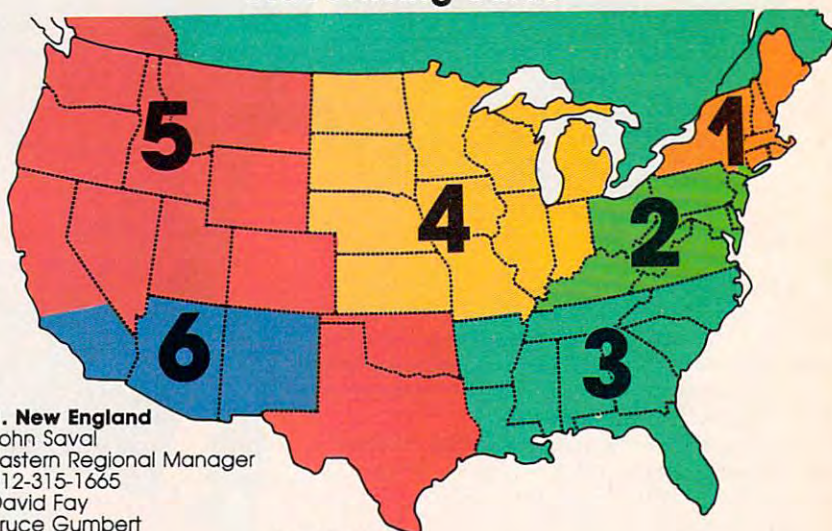
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The Editors and Readers of COMPUTE!

## New Life For Old Ribbons

I have a Gemini 10X printer with a cloth ribbon, and have discovered a way to refresh the ink on a used cloth ribbon. First take the ribbon out of the printer and spread it out on newspaper, then spray an even but light coat of WD-40 on the ribbon. This will darken the ribbon a bit. After letting the ribbon dry overnight, wind it back into the cartridge and reinstall it in the printer. It's almost as good as a brand-new ribbon. This works because the WD-40 breaks up the ink particles and redistributes them from the unused portions of the ribbon.

John A. Hashem

*Your method seems to be a good one, since WD-40 is a solvent, in addition to being a lubricant. The only question is whether or not the remaining WD-40 would interfere with the printhead, or infuse your correspondence with a petroleum odor. The added lubrication couldn't hurt, but it could cause extra dust to accumulate and gum up the printhead. Here's another trick that's worked for us. Pull out a small section of the ribbon, and make a half-twist. Now wind the twist into the cartridge and continue winding until the twist pops out again (it could take a while). The ribbon is now upside-down, and the rear surface of the ribbon has now come to the front. Since printers use only a portion of the ribbon, this should bring a fresh, unused part of the ribbon into play. Do not use this technique with carbon ribbons (which work only in one direction), or if your ribbon cartridge is too tightly wound to let the twist pass all the way through. Some ribbon cartridges automatically perform this half-twist for you.*

## IBM PC/PCjr BASIC Compatibility

I would like to know if a program written for the PCjr in Cartridge BASIC would work on the PC with a color/graphics adapter and BASIC?

Richard Bookal

*The PC and PCjr are quite compatible, considering the differences in the hardware. Since Cartridge BASIC contains all the commands of BASICA (plus a few PCjr-specific commands), most programs written in BASIC or BASICA on the PC will work on the PCjr. To go the other way, the PC must have*

*BASICA and the color/graphics adapter, and it helps to have the game controller adapter (and joystick), since many PCjr programs take advantage of the built-in joystick interface.*

One problem when running a PCjr program on the PC is that the PCjr has several graphics modes not found on the PC. The PC with the color graphics adapter supports SCREEN 1, the  $320 \times 200$  four-color mode; and SCREEN 2, the  $640 \times 200$  two-color mode. The PCjr, of course, supports quite a few more modes, including a  $160 \times 200$  and  $320 \times 200$  16-color mode. It's possible (though by no means easy) to rewrite such a PCjr program to run on the PC. Remember that some of the commands in Cartridge BASIC are not found in PC BASICA. These include PCOPY, PALETTE, and PALETTE USING.

Additionally, the PCjr boasts a 3-voice, 10-bit sound chip with white noise capability. The PC has only a programmable beeper, but since the PCjr also has this capability, you can use the beeper instead if you're interested in compatibility.

As long as you avoid these enhanced PCjr features, you can write programs on the PCjr that will run as is on the PC. Since both machines use the same microprocessor, machine language programs will also transfer, as long as you avoid direct calls into the ROMs. Instead, make use of the BIOS routines, documented in the PC or PCjr Technical Reference Manual. Also, do not use software timing loops, since the PC generally runs faster than a PCjr. You can instead use the programmable timer that behaves the same on both machines. IBM programmers have been eagerly awaiting a new color/graphics card for the PC that will emulate some of the features of the PCjr, but to date no such card exists.

## Commodore Comma Conflicts

I have a Commodore 64. Whenever I try to INPUT something into a string using a comma, the computer rejects everything thereafter, including the comma. How do you enter commas in response to an INPUT statement?

Ronald Weber

*INPUT is a versatile command, but you've run smack into its biggest limitation. You may not be*





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aware of the intended purpose of the comma. For example, try this program:

```
10 INPUT "Name: Last, First";L$,F$
20 PRINT "Your name is ";F$;" ";L$
```

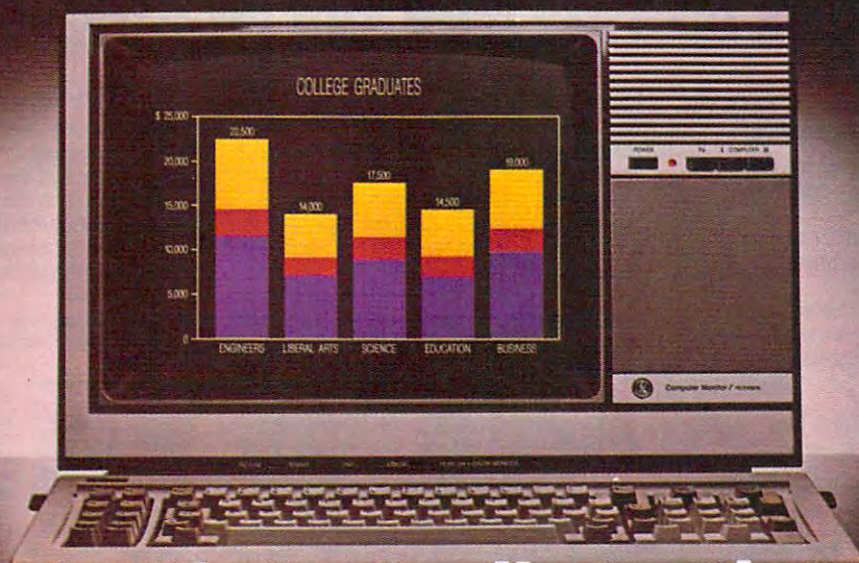
When you run this, you can enter both your last and first name on the same line in response to the INPUT statement. You separate the items with commas. Alternately, you can press RETURN after the first entry, and a question mark appears for the next. It's sometimes very convenient to use the comma for this purpose. But if the INPUT statement does not require more than one entry, the comma makes no sense to the computer, and it reminds you that it didn't know what to do by displaying ?EXTRA IGNORED. Everything thereafter (including the comma) is seen as an errant second input and is therefore thrown out. You may have also noticed that colons behave much like commas, giving you ?EXTRA IGNORED.

Aside from programming your own special version of INPUT by using the GET command, there is one trick that lets you enter anything into an INPUT statement, even leading and trailing spaces (which are normally removed). Just start your entry with a quote. This will put you in quote mode, so be careful with cursor controls. Alternately, you could enter two quotes, then backspace with DELETE to erase the second quote. This gives you the leading

quote, but keeps you out of quote mode. INPUT accepts everything within quotes. Notice, though, that the quote marks are not included as part of the entry. Only what's inside the quotes will count. Also keep in mind that these limitations (or features) also apply to INPUT# with tape, disk, or other devices.

Sometimes the best solution is to just write your own version of the INPUT statement. Try this small subroutine with GOSUB 10000. It does not allow cursor controls (other than backspacing with DELETE), but it will accept any printable character. The line typed as input is available in the variable IN\$. No prompt is printed, so your main program should PRINT the question before calling this subroutine. Since a string is limited to 255 characters, the variable IL is set to 255 on line 10000. If you want a smaller limit, change line 10000, or just set IL in your main program, make IN\$="", and GOSUB 10000.

```
10000 IN$="":IL=255:rem 213
10010 PRINT "[+]{LEFT}";:rem 65
10020 GETI$:IFI$=""THEN10020:rem 25
10030 PRINT "{LEFT}";:IN=ASC(I$):IFIN=13T
HENPRINT:RETURN:rem 23
10040 IFIN=20ANDLEN(IN$)THENIN$=LEFT$(IN$
,LEN(IN$)-1):PRINTI$;:GOTO10010:rem 67
10050 IF(INAND127)<32ORLEN(IN$)=ILTHEN100
10:rem 250
10060 PRINTI$;:POKE212,0:IN$=IN$+I$:GOTO1
0010:rem 112
```



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## Printer Interface Graffiti

I would like to inform the readers about a peculiarity within the Cardco Card/? G+ printer interface. I was playing around with my printer when it printed the following:

(c) Copyright 1983 CARDCO INC.  
Jackie, This one's for you!  
-Breck

Could you please tell me what this means and how I can get this to happen again?

Eric Milota

*Most likely, you accidentally triggered the interface into a reset or self-test mode. It's somehow reassuring to discover affectionate graffiti hidden within the high-tech metal heart of a printer interface.*

## Atari XL Super POKES

I read in an earlier issue of COMPUTE! that some Atari owners do not like the audible keyboard feedback (keyboard click). You can always turn down the volume, but this prevents you from hearing any other sound effects. This simple POKE will turn off the keyboard click: POKE 731,1. POKE it with a zero to turn the click back on.

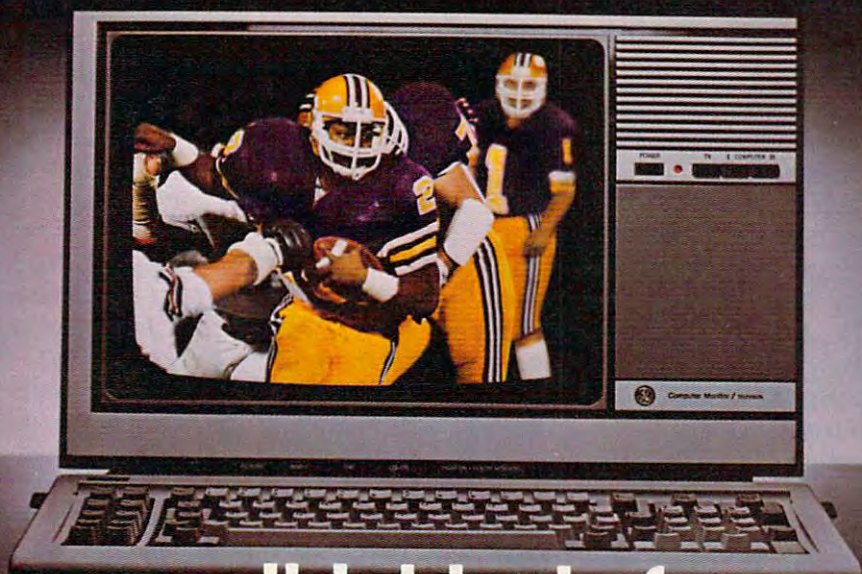
Jeff Tjebckes

This POKE works only on the new XL Atari models, not on the original 400/800 computers. There is no easy software solution for the 400/800, but this POKE works fine on the 1200XL, 600XL, and 800XL. There are many other useful POKES on the XL computers. Remember that none of these POKES will work with the older 400/800 computers, so if you are writing programs for publication or sharing, keep this in mind.

First try this one: POKE 622,255:GRAPHICS 0. This allows fine scrolling of GRAPHICS 0 screens. Instead of jumping up a line at a time, the screen will smoothly scroll 1/8 character at a time. Use POKE 622,0:GRAPHICS 0 to reset the scroll. You must always follow this POKE with GRAPHICS 0.

POKE 756,204 enables the built-in international character set. Hold down CTRL and press some of the letters of the alphabet to see these new characters. Use POKE 756,224 to go back to the normal character set with the graphics characters. POKE 621,255 disables the keyboard, and POKE 621,0 reenables it. SYSTEM RESET will get you out of this mode if it gets you into trouble. You can read the HELP key with PEEK(732). Location 732 returns a 17 when the HELP key has been pressed. You must POKE it with a 0 to clear it out after you've acted on the key. SHIFT and CTRL also affect the HELP key, returning 81 and 145, respectively.

All keys begin to repeat when you hold them



# it even runs this kind of program.

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down. To change the delay before the key begins to repeat, POKE 729 with the number of 1/60 seconds you want to delay. A value of 30 would be a half-second delay. The default is 48, or 4/5 second. A POKE to 730 controls how quickly a key repeats once the repeat has begun. The delay between repeats is also measured in 1/60 seconds. The default here is about 1/10 second.

If you want to take advantage of XL features, yet permit the program to run on the 400/800, you can check the operating system ID byte, found at location 65527 in ROM. There is a different number for every version of the Atari operating system. If this byte returns a value for the 400/800, you can skip over the statements specific to XL models. Consult *COMPUTE! Books' Mapping the Atari* for a comprehensive guide to Atari memory, and the article "An Introduction to Atari PEEKs and POKes" in *The Atari Collection, Volume 1*, due to be released in a few weeks.

Operating System	PEEK(65527)
400/800 Revision A	221, 87, or 243
400/800 Revision B	230
1200XL Revision A	10
1200XL Revision B	11
600XL	1
800XL	2

## Disabling Apple's RESET Key

How do you disable the RESET key on the Apple II+ in BASIC?

Alex Tarlecky

The RESET key generates a hardware interrupt on the Apple, not a software interrupt. However, it's still possible to control the interrupt request by altering the RESET vector at memory locations 1010 and 1011 (\$3F2 and \$3F3). The value stored in these locations (in low-byte, high-byte form) is set at power-up by whatever program is controlling the Apple. If no disk drive is attached and the Apple has an Autostart ROM, the RAM RESET vector points to BASIC. If there is a disk drive, the computer enters the bootstrap program contained in ROM on the disk-controller card. The value of the RAM RESET vector is usually set by software loaded from the disk.

Autostart ROM only boots the disk on RESET when the computer is first turned on. Other RESETs initiate a jump to the address held by the ROM RESET vector. The operating system uses a code stored in location 1012 (\$3F4) to determine if the request for a RESET was initiated by a power-up or not. This code is never properly set at power-up, so a "cold start" results, rebooting the BASIC operating system from the disk. Any program can scramble this code and force a cold start by POKEing a new value into this location.

The code byte at address 1012 (\$3F4) must be

the Exclusive-OR between 165 (\$A5) and the contents of 1011 (\$3F3), or a power-up RESET will result.

If your intention is to prevent unauthorized people from LISTing your programs, you could enter this as your greeting (HELLO) program:

```
10 REM AUTO RUN GREETING
20 POKE 1012, PEEK(1012) AND 10
30 END
```

This alters the RESET vector to an invalid number, so pressing the RESET key to interrupt the program forces a cold start, causing the disk to reboot. One disadvantage is that all users, including you, will be prevented from interrupting or listing the program when booting from this disk.

Line 20 could also be included in the program you wish to protect. Pressing the RESET key would cause the disk to reboot, and the altered location would then be correct until the program was run again. But remember that no protection method is absolutely foolproof—this technique will only discourage people from attempting to tamper with your program.

## Commodore Tape Sequential Access

I own a VIC-20 and have found that the computer won't recognize a file unless the cassette is set near the beginning of the file. Can this limitation be resolved?

Andy Little

Cassette files are always sequential, and must be read in the same order that they were written. The first part of a tape file is a header containing the filename and other information such as the starting and ending address of a program. Without this header, the computer's Kernal tape routines do not know how to locate and use the data that follows, so you can't just start reading a cassette file partway through. There are ROM routines for directly reading and writing blocks of data to the tape, but the technique is too involved to cover here, and there are many problems with such a method.

## Apple/Okidata Graphics Printing

I am using a KoalaPad and am wondering if there is any way you can print pictures produced with KoalaPaint. I am using an Okidata 82A printer. Can this printer reproduce computer graphics?

Bob Spachman, Jr.

Koala Technologies offers a package called KoalaPrint that will print high-resolution pictures to a variety of printers. You may also be able to use other printer dump packages to print KoalaPad pictures. However, your printer does not have high-



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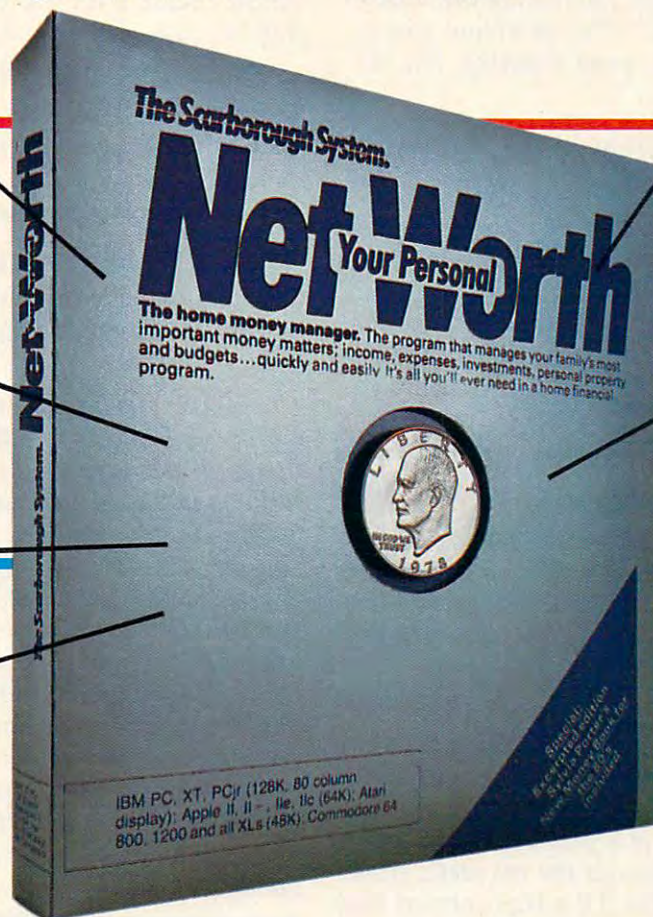
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resolution graphics capability. It can only print TRS-80 style graphics of a resolution of  $3 \times 2$  pixels per character.

## IBM PC & PCjr Magazine Correction

There seems to be an error printed in the PCjr version of David J. Bohlke's "Cannonball" game, which ran in the August 1984 issue of COMPUTE!'s PC & PCjr magazine. The program ran perfectly until I blew up RED's cannon, but all I got for an explosion was a line across the screen, then the program crashed. The error was in line 625, which reads:

```
625 W=INT(RND*4+4): W,15,3:FOR J=1
    TO 10:NEXT
```

I think it should read:

```
625 W=INT(RND*4+4): W=15*3:FOR J=1
    TO 10:NEXT
```

It took quite a while to figure out, but I just had to experiment with the program.

Mike Batteiger

Since subscribers of COMPUTE!'s PC & PCjr magazine now receive COMPUTE!, we're publishing the answer here in "Readers' Feedback." The correction you've given will prevent the game from crashing, but the line should read:

```
625 W=INT(RND*4+4): SOUND W,15,3:FOR
    J=1 TO 10:NEXT
```

We fully tested the program on a PCjr, but we made the listing for the PCjr version of the game on an IBM PC. The PCjr's SOUND command is not compatible with the PC's SOUND command, so the command itself would not list on the PC. Our staff have been alerted to watch for this potential problem in the future.

## TV And Tape Interaction

My cousin sent me some programs on tape for my Commodore 64, but they will not load unless I turn off the television set. I've done everything the Datassette manual suggests. Can you offer any advice?

Brian Dorsey

At first, this interaction seems most peculiar. How could your TV have anything to do with your cassette recorder? In fact, though, a television or monitor used with a computer is a primary source of magnetic interference. Although the magnetic field (which can emanate from the TV's transformer) may not erase any tapes or disks, the field can prevent the read head from reading the tape or disk. To solve this problem, move your recorder or disk drive at least two feet away from the television. It's also

not a good idea to store tapes or disks within two feet of a television or monitor. And beware of stereo speakers, telephones, and any equipment with a transformer. You may also want to place the power supply boxes on the floor instead of on the same desk or table as your computer.

## Commodore Secondary Addresses

I own a Commodore computer and can't find out what the different secondary addresses are for device #2 (the RS-232 port). What numbers do you use here?

Kevin Rose

The secondary address is not really used for opening an RS-232 channel, so you should use a value of zero. Remember that OPENing an RS-232 channel clears out all variables and closes all other files, so OPEN the RS-232 file at the beginning of your program before any variables are defined or DIMensioned. The optional parameters for RS-232 are specified in the filename (we use a file number of 2 here):

```
OPEN 2,2,0,CHR$(control register);CHR$(command
register)
```

For 300 baud, with a word length of eight bits, one stop bit, full duplex, and no parity, you can use:

```
OPEN 2,2,0,CHR$(6)+CHR$(0)
```

Complete tables are given on pages 350 and 351 of the Commodore 64 Programmer's Reference Guide.

## Atari 800XL Memory Expansion

Can you use the memory expansion intended for the 600XL to expand the memory of the 800XL?

Toby Buckalew

The 600XL memory expansion brings the total memory of the 600XL up to the maximum of 64K. Although it would plug into the 800XL, this would be futile (and would confuse the computer), since the 800XL already has 64K. Memory is not merely an add-on item—it has to fit correctly into the computer's memory map. Since the memory map is full on the 800XL, you would need some other kind of expansion memory that uses bank switching or windowing to get more than 64K of system memory. You could never have more than 64K of memory at one time, but you could swap out (bank switch) portions of the expanded memory in a cartridge that allows this. Don't expect any commercial software to take advantage of such an unusual memory configuration, though.

## Commodore Plus/4 Peripherals

I own a Commodore 64, Epson RX-80 printer with a Tymac Connection interface, and an MSD



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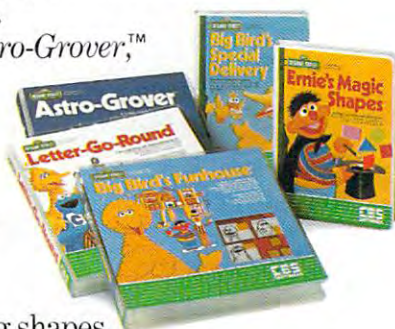
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single disk drive. If I purchase the new Commodore Plus/4, will I be able to use my 64 peripherals with it? Will my Commodore 64 software work on the Plus/4?

Otis Smerd

The Plus/4 uses a redesigned cassette jack, so you will not be able to use an existing Datasette with the Plus/4. As long as the printer interface does not use the 64 cassette port for power supply, it will work with the Plus/4. Almost any device using the round serial port, including your disk drive, will also work with the Plus/4. The Commodore 1702 color monitor is also compatible with this computer via the rear connections. Unfortunately, you can't use your 64 or Atari joysticks with the Plus/4 (even though the joystick circuitry is compatible) since the Plus/4 uses a proprietary joystick port. Perhaps Commodore or a third-party manufacturer will sell joystick or cassette port adapters.

Although the Plus/4 uses the same type of microprocessor and similar operating system as the 64, the hardware is not compatible with 64 software. Few 64 programs will run on the Plus/4, just as you can't readily transfer software between the VIC and 64. Some 64 (or VIC) BASIC programs that avoid PEEKs, POKEs, and machine language will load and run on the Plus/4, but you'll have to convert most programs yourself. Since the peripherals are compatible, the ideal solution is to own both computers.

---

## Atari Attract Mode

I own an Atari 1200XL. So far, I have programmed two games in BASIC, but there is one problem I haven't solved. After about 8-10 minutes of play, the screen starts to change colors. Is there any way to get around this annoyance? Also, I heard that Atari has a contest for amateur programmers. Have you heard anything about this?

John Hnat

The Atari computers incorporate the color shifting to protect the screen from damage. Normally, you have nothing to worry about, since TV images change constantly, but theoretically an image could burn itself into the phosphor if left displayed unchanged for a long period of time. Back in the early days of Atari computers, rumors about this problem were seized upon by the public and blown all out of proportion. To allay fears, all Atari machines have this color shifting protection built-in. If the keyboard has not been touched for 8.5 minutes, all the colors cycle at a reduced brightness. This constant color shift prevents any one image from burning into the TV screen. However, we have never seen a documented case of a home computer damaging a television due to long exposure. Incidentally, the

color shifting is called attract mode, named after the way arcade games will play automatically to attract customers.

Every four seconds, memory location 77 is incremented by one. When it reaches 128, attract mode starts. To prevent attract mode, POKE 77,0 periodically. If you want to preserve the intention of attract mode, perform this POKE only when the player makes some action, as in moving the joystick. If you are playing a game that does not disable attract mode, you can press any key to stop the color shifting. Sometimes a keystroke interferes with a program, but you can often press the inverse video key (which doesn't generate an ATASCII keystroke) twice to cancel attract mode while a program is running.

The Atari Program Exchange (APX), which has been recently discontinued, was a potpourri of user-written programs. You would send your program for consideration. If it was good enough, Atari would market your game through the APX catalog. There were also quarterly prizes in several categories for the best programs received, and the famous Atari Star award was given once a year for the best program overall. The prize money (\$25,000) gave the first Atari Star winner Fernando Herrera the impetus needed to start his own software company, First Star Software. IBM has started a similar mail-order service for the PC and PCjr, called Personally Developed Software.

---

## Microsoft BASIC Variable Annihilation

When my program stops on an error, I edit the offending line, intending to CONTinue after I've made the change, but am amazed to find that changing a program line clears out all variables. I have to rerun the program and enter all the lost information every time I make a change. Why does this happen, and how can I get around the problem?

John H. Leonard

This problem, which is endemic to Microsoft BASIC (Atari BASIC preserves variables when you change a line) cannot be readily overcome. Variables are stored in memory immediately after the last line in your program. When editing or entering a line, the final program could become larger, and would overwrite some variables, turning them into an unseemly binary mush. BASIC could move the variables when a program changes size, but the designers of Microsoft BASIC decided to just clear all the variables.

---

## Commodore Repair Tips

I am a Commodore owner, and am running a repair shop for Commodore equipment. I wanted



to pass on a few tips to your readers. First, about 90 percent of all machines are returned due to a blown fuse. This causes a blank picture, even though the power LED still shines. The fuse is easy to replace if you can open the case. The second biggest problem is due to a blown PLA (programmable logic array) chip. Unfortunately, I have not been able to obtain parts from Commodore, and am relying on used and broken 64s for spare chips. Also, I welcome any questions on repairs or simply on how things work.

Steve Fogolini  
8232 Richard Street  
Fort Worth, TX 76108

We're publishing your address so that interested readers can contact you, but be ready for a deluge of mail. Also, readers should beware that they will void their 90-day warranty by opening or tampering with the computer. We have over a dozen 64s in-house, and if a 64 goes bad, it is indeed usually the result of a blown fuse or a damaged CIA (Complex Interface Adapter) chip. It's easy to destroy the CIA merely by touching the exposed joystick port (which is connected to the CIA) in a static-prone environment. As you said, though, Commodore is reluctant to supply individuals with replacement chips.

## Backing Up the Atari Macro Assembler

Due to built-in limitations, you can copy the Atari Macro Assembler/Editor (AMAC) package to another disk, but the copied program will not run. This prevents you from making a backup copy for archival purposes. Additionally, it is inconvenient to have to switch between the AMAC disk and your program disk when you are assembling from disk. It's easier if you can copy the assembler to the same disk as your source code files. Fortunately, this problem is easy to fix. First copy the file "D:AMAC" to another disk, then run this small program. It makes a small change to the assembler, so that the copy will work properly.

James A. Tunnicliffe

```
10 OPEN #1,12,0,"D:AMAC":FOR I=1 TO
  8:GET #1,A:NEXT I:PUT #1,208:PU
  T #1,34:CLOSE #1
```

Thanks for the modification.

## Apple Trigonometry

I was planning to do my trigonometry homework on my computer. I have an Apple II+ and wanted to use the functions SIN, TAN, and COS. I had assumed that the number you put into the parentheses was the number of degrees of an an-

gle, but when I tried it this way the result was not the same as the number on my chart. It didn't agree with COS, SIN, or TAN. So I looked up these functions in my user's manual, but they gave some explanation about radians and other things I could not comprehend. Could you please give me an understandable explanation of what these functions do?

Chuck Knakal, Jr.

The trigonometric functions on the Apple II+ as well as most other computers use radians instead of degrees to specify an angle. Most of us are accustomed to measuring angles in degrees, but radians are actually easier to use when performing complex calculations. Radians are based on the mathematical relationship between a circle's diameter and its circumference. Degrees, on the other hand, are arbitrary and as a result are cumbersome to deal with in calculations.

If you prefer to think in terms of degrees instead of radians, the following table will help you translate between the two.

Degrees	Radians
0	0
90	$\pi/2$
180	$\pi$
270	$1.5\pi$
360	$2\pi$

(Where  $\pi$  is approximately 3.1416.)

The following formulas can be used in your program to convert from radians to degrees and vice versa:

Radians=degrees\*3.1416/180  
Degrees=radians\*180/3.1416

Here's a program that will calculate the SIN of any angle specified in degrees:

```
10 INPUT "ANGLE IN DEGREES:";D
20 R = D * 3.1416 / 180
30 PRINT "SIN=", SIN (R)
```

## TI-99/4A Character Memory

Recently I came across something on my TI-99/4A which I don't understand. With Extended BASIC installed and no program in memory, I defined a character from 127 to 143 with the CHAR subprogram. I then typed NEW and SIZE (to give the amount of memory available). I found no memory had been used although the character remained redefined. Can you explain this?

Chris Teixeira

In Extended BASIC, the SIZE command returns the number of bytes left for BASIC programming and variable storage. Character codes for characters from 127 to 143, however, are stored in a separate protected area of memory. This is why you observed no



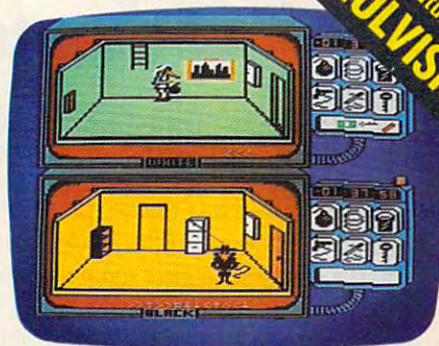


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difference in the memory available for programming after you defined a character in this range.

Since the area of memory used for defining characters 127 to 143 is not affected by the BASIC program, it can be used to pass variable values between programs. Variable data need only be coded into a 16-character hexadecimal string (a pattern identifier). CALL CHAR is used to store the string (which can hold eight bytes), and CALL CHARPAT will retrieve the string. For details on this method, see "Transferring Variables in TI Extended BASIC" by Patrick Parrish in COMPUTE!'s TI Collection, Volume 1.

## Atari USR

I own an Atari 600XL, but don't have a complete manual. What does the USR statement do? I've seen it in several programs, such as `A=USR(1536)`. What is the 1536 for? Why can't you enter `USR(710)` to change the color of the screen?

USR looks like any other BASIC function, but is the gateway from Atari BASIC to machine language. It does not work like POKE or PEEK, which can be used to change and read memory locations like 710, which holds the background color of a GRAPHICS 0 screen. An understanding of machine language is

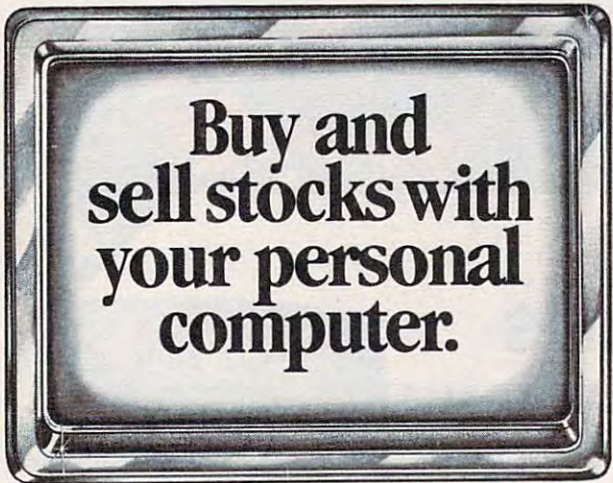
essential in creating your own USR calls, but there are many plug-in subroutines (published in our books and in COMPUTE!) that you can add to your program.

For machine language programmers, USR lets you pass parameters (variable values or expressions) to the machine language program. `A=USR(n,x,y,z)` would start the 6502 executing the code at memory location `n` (instead of executing the BASIC interpreter). Since there are three parameters in the example, the number 3 will be the first item on the 6502 stack (use PLA to read a byte off the top of the stack into the accumulator). If there are no parameters, a zero is used, and you must pull this zero off before you use RTS to return to BASIC. The rest of the parameters are converted to 16-bit unsigned integers, and placed in order on the stack. Each parameter becomes a two-byte number which is found on the stack high byte first, then low byte: The stack after the call `A=USR(1536,5,65535,2562)`:

Top of stack: 3  
0  
5  
255  
255  
10  
2

The next two bytes are the return address—1 of the BASIC interpreter, since JSR (which is how USR calls the ML) stores this address on the stack.

Since USR is a function, you can't use it by itself, but must use a statement like `X=USR(1536)`. The actual variable you use doesn't matter, but the ML program can pass a value back to BASIC by storing the low byte of the number in `$D4` and the high byte in `$D5`. This value will be assigned to the variable used in the USR statement. ©



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# Controlling Your Home By Computer

Sharon Darling, Research Assistant

*In the cartoon home of George and Jane Jetson, computers controlled everything from preparing meals to walking the dog. While such a supercomputerized house seems somehow overkill, reality has begun to catch up to the Jetson fantasy. There are some serious applications for the home. Your computer can connect to a variety of devices which let you control alarm systems, monitor heat and air conditioning, start your dishwasher, and even activate your coffee pot in the morning.*

---

If we were still in the energy crisis mind-set of a few years back, William Brayden might now have more business than he could handle.

His company, Savergy, Inc., sells two control devices he developed for the Commodore 64 which will monitor and control energy use. While he estimates a homeowner can save at least 25 percent on energy consumption by using control devices, he says sales of his Computer Interface Module 112 have not been as great as he initially expected.

"We've seen a considerable attitude change in the last year," says Brayden, who has been in the energy management field since 1978. "It's like when gas first went up from about 30 cents a gallon to a dollar—everybody screamed about it, but nobody's screaming about it today. It's the same thing with home heat and energy—they were screaming about it like crazy. Now a lot of people tend to accept it rather than do something about it."

Brayden remains convinced, however, that computer owners who don't take advantage of their computer's capabilities to help control their homes are missing excellent opportunities to save money.

## Saverly's Commodore Systems

Brayden offers two methods of cutting costs, both of which use the Commodore 64 or VIC-20 as controllers. Savergy's CIM 112 (\$479) is dedicated to controlling large appliances such as water heaters, washing machines,

air conditioners, and the like. The Powerport (\$99.95) turns lights on and off, controls lawn sprinkler systems, and even operates the percolator.

"You're never going to be able to do any serious energy management by controlling lights and coffee pots—you have to be able to control the high power loads that are really eating up the electricity," Brayden says. So, while devices hooked up to small appliances and controlled by your computer can be convenient, they're not going to save you much money.

Brayden's software uses time-of-day scheduling and duty cycling to conserve energy usage. With duty cycling, an appliance such as an air conditioner can be turned on for a preset number of minutes, then turned off. The cycle would then be repeated. With a traditional system, the air conditioner runs continuously, until the desired temperature is reached.



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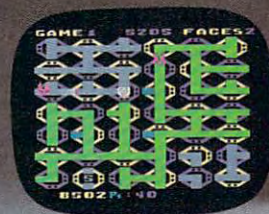
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Brayden explains that with duty cycling, the temperature "kind of peaks out in a nice, round peak and then tends to start tapering off—it doesn't immediately drop down to its off temperature, so if you turn it on for four minutes, and turn it off for one minute, you have an 80 percent duty cycle."

## Apple, IBM, Commodore Connections

During that one minute off-time, heat or air conditioning would still be radiating throughout the house, Brayden says, but for free, since the compressor would not be operating. "The combination of turning things off through scheduling when you don't need them on, and duty cycling them if they are appropriate for that, is how we very conservatively came up with the 25 percent savings," he adds.

A simple computer control system might begin with appliance controllers, since they are fairly inexpensive and relatively easy to install, says James Coffron, author of several books on computerized home control, including *The IBM PC Connection*, *The Commodore 64 Connection*, and *The Apple Connection* (Sybex).

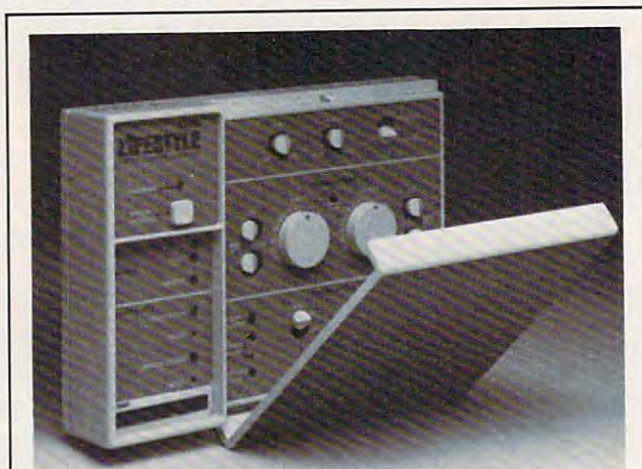
Coffron estimates that a person could set up a simple system, using a Commodore 64, for around \$200.

The heart of most control systems for small appliances and light switches is centered in modules (available from BSR Ltd. and Leviton Manufacturing Co., among others) which plug into the wall, and receive instructions from a computer. Your computer sends a signal which is received by the BSR module. The results, for example, may be that the lights are dimmed, the stereo starts play-

ing music, the coffee pot turns on, or any of a hundred other computer-activated chores are carried out. (For more do-it-yourself information, see *COMPUTE! Books' Home Energy Applications On Your Personal Computer*.)

## The Genesis Controllers

Another firm which makes a series of home control products that can be used separately or together is Genesis Computer Corporation. The products run on either the VIC-20 or Commodore 64.



ESI's SavIt is an automatic temperature control system which contains its own computer.

Genesis' VIController (\$69.95) is a plug-in unit with software on disk which is used in conjunction with remote BSR-type switches to automate appliances and lights through time-of-day scheduling.

The firm's COMsense device (also \$69.95) allows doors and windows to be hooked up to the computer. Used in combination with the VIController and magnetic reed switches, a simple home security system can be set up.

Let's say you want to have your computer flash the lights on and off if a door or window is opened. The magnetic reeds (available inexpensively from hardware or appliance stores) are attached to the doors and windows that are to be moni-

tored. When the connection is broken, the reeds send a signal to COMsense, which in turn delivers a message to the VIController. The controller then flashes the lights.

COMsense can also be programmed to sense such things as air or water temperature, ground moisture, and humidity. With that type of information, the VIController would know to turn on the lawn sprinkler when the moisture level drops below a certain point or turn on the heater when the temperature falls.

Another Genesis product, the COMclock (\$69.95), is a battery-powered, realtime clock which contains its own ROM chip. It connects to the Commodore 64 through the expansion port, and can automatically reboot the software used by the VIController if there is a power failure or interruption. Savergy's products are compatible with COMsense and COMclock.


## Do-It-Yourself Transducers

For real do-it-yourselfers, another way to build a home security system is with *transducers*, says Coffron. Transducers sense physical information, such as a door being open, and send an electrical signal that the computer can understand.

Depending on what type of program you've designed for your security system, any one of a number of actions can be programmed: An alarm can sound, lights can start flashing, or your computer can automatically dial law enforcement authorities, via modem, alerting them to the break-in.

Software also can be used to schedule the times at which appliances and lights are turned on and off.

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mechanical genius to put such a system together, Coffron adds. "That had a lot to do with why I wrote the books," he says. "To show that you don't need to be a genius." Installing transducers and BSR modules is "a pretty straightforward kind of thing, and the wiring is like putting up speakers for your stereo—everybody takes that as a pretty mundane function," Coffron says.

But do you want to dedicate your computer to just controlling your home?

An alternative many people opt for is to buy a relatively inexpensive machine, such as the VIC-20 or Commodore 64, and use it solely for home control. Coffron says he designed the systems diagrammed in his books to be used at times when the computer was not needed for other functions.

With the VICController, the computer can be used for other programs, once the time-of-day scheduling software is up and running, says Randy Brust, vice president of Genesis.

## The High-End Future

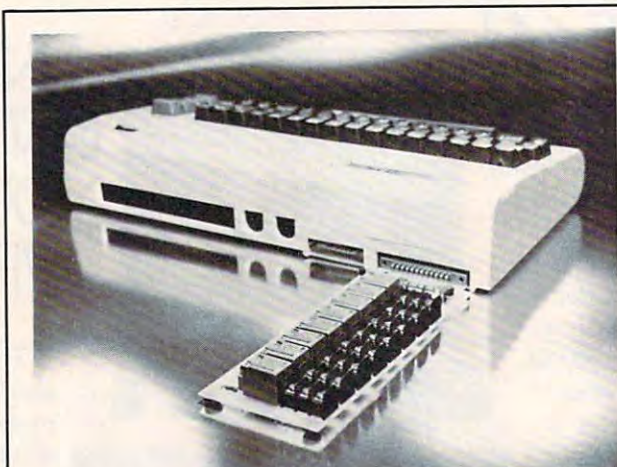
For people interested in an entire home control system, there are several high-end products which come complete with their own microprocessors. While their costs are significantly higher, they point the way to what will surely be the home control formats of the future.

Electronic Systems International has introduced the \$898 SavIt Lifestyle energy control computer, which monitors heat and air conditioning use. The system can reportedly save up to 42 percent on a home's or small business's annual heating and cooling costs.

The computer electronically senses the temperature, as well as temperature changes. It checks the temperature every

1-1/2 seconds, and automatically adjusts the heating and air conditioning for different times of the day.

Another control package, the HomeBrain Intelligence System, controls and monitors energy consumption, security and fire safety, environment, and lighting and appliances. Produced by HyperTek Incorporated, HomeBrain lets you program the variables you desire for temperature and light sensors, sirens, switches, and motion sensors. Once these are set, a personal computer isn't



*The Powerport from Savergy, Inc., plugs into the user port of a Commodore 64 to control appliances.*

needed with HomeBrain. The unit's CPU takes care of the rest. Up to 300 different switch-controllable devices can be hooked up to HomeBrain, although not all simultaneously.

The system has a variety of subtle monitoring formats. For example, a rain sensor can make sure that the lawn is not watered during a rainstorm. Motion detectors can tell when the house is empty, so that heat or air conditioning won't run needlessly when no one's home.

At \$1499 suggested retail, the HomeBrain system isn't cheap. The manufacturers estimate a three- to five-year payback, with energy savings of 10 to 30 percent.

HyperTek also makes an enhanced package, complete with software and peripherals, which retails for \$2149. That system is preprogrammed for a typical house, says Eric Davidson, director of marketing at HyperTek.

## That Warm Feeling

Brust and Coffron agree that one of the most popular uses for computer control devices is home security. It offers an intangible psychological benefit, Coffron says—peace of mind.

"It gives you a warm feeling that everything is as it should be."

While it may be a somewhat exacting process to start a computer-based home control system from scratch, both Coffron and Brayden foresee a

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time when houses will be built with computers already installed.

"I firmly believe that within five to ten years, builders will start building a computer nook into a home, and at that point, it becomes very feasible to have your so-called black box [controller] sitting next to that home computer," Brayden says.

Coffron predicts that homes in the not too distant future will have computer jacks in every room, the way electrical outlets and telephone jacks are commonplace now. Along with the jacks, "there will be interfaces for whatever computer you have, and they'll be tied in to wiring all over your house, so you really won't have to do anything but run your home security package, or run your home control package." ©

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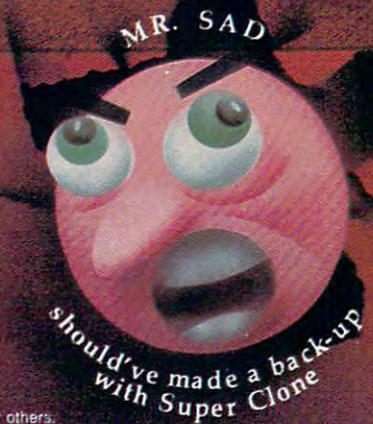
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# Personal Finance Made Simple

Kathy Yakal, Feature Writer

*No matter how much money you earn, it never seems enough. Stretching your income to pay for everything you need, and still putting a little away for retirement, often require the services of an accountant. But thanks to recent personal finance software for your computer, the accountant's fee may be one expense you can forego.*

**A**ndrew Tobias, best-selling author and financial guru, watched through a one-way mirror as people tried using his new home finance software. Unlike most such programs, Tobias's package has personality: It incorporates his dry wit as well as his financial talents. The program is comprehensive, easy-to-use, and entertaining. As Tobias anonymously observed the final consumer testing, everything seemed to be going well and the responses were favorable.

Then one of the test customers raised an objection. After using the program for a while, he announced he would never buy it. "It's got a sense of humor," he said. "Money is a very serious matter."

No pain, no gain. If it tastes bad, it must be good for you. Keeping track of personal finances is something that many of us have always assumed must be painful. But now a home computer can help ease that burden. Personal budget programs, ranging from simple

checkbook-balancers to complete financial packages, are simplifying money matters for thousands of people.

**W**ho needs it? "Anyone who is motivated and forward-looking, because people who have no interest in the future and aren't motivated don't buy computers," says Tobias.

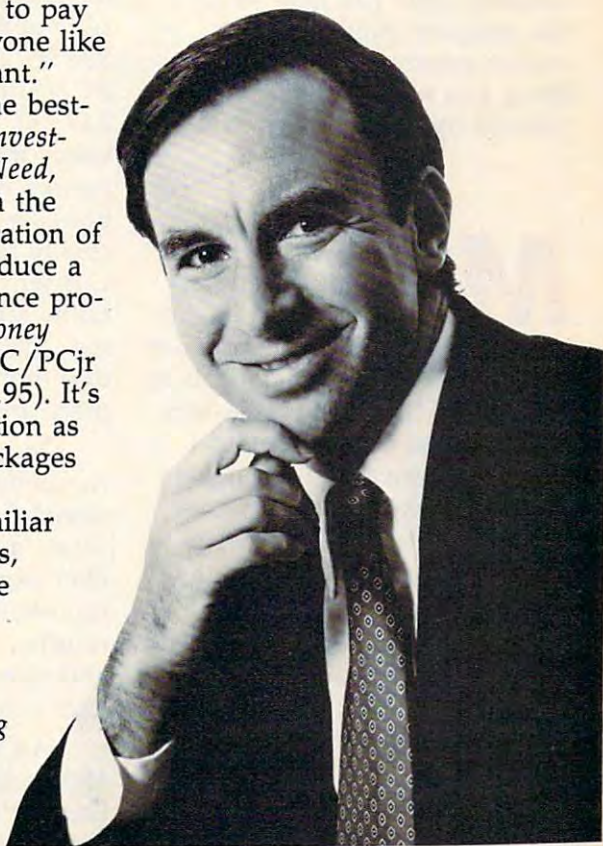
"Anyone who fits that profile by definition has the intelligence, motivation, and financial needs. They may not have a lot of money, but they have earning power and they have a future they're trying to plan for, and they certainly have to pay bills and pay taxes. Anyone like that is a suitable applicant."

Tobias, author of the best-selling book *The Only Investment Guide You'll Ever Need*, recently teamed up with the Micro Education Corporation of America (MECA) to produce a sophisticated home finance program, *Managing Your Money* (available for the IBM PC/PCjr and Apple IIe/IIc; \$199.95). It's quickly gained a reputation as one of the best such packages on the market.

Though he was familiar with personal computers, having bought an Apple III a few years back, Tobias was doubtful

whether a home computer could handle a comprehensive financial package. "I kept saying, 'Can it do all that?' And they kept telling me, 'Forget what it can do. Just tell us what you want it to do.'"

He found out the computer could do everything he wanted. "My idea was to have a place in the program for everything that a family would have—short of the Rockefellers and Mellons—anywhere from middle class to upper-middle class. What does a family like that have? Checking and savings accounts, budgeting



*Andrew Tobias, best-selling author and designer of Managing Your Money, an acclaimed financial package.*



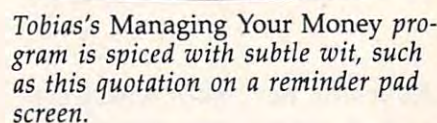
The program turned out, he thinks, better than a book. "Far from just telling someone, 'Gee, you should make a budget,' we actually give them something that will help them make a budget and keep up-to-date. This thing is a utility. It actually does things. [It's] the difference between a cookbook that gives you recipes and a kitchen that has seven or eight appliances and each of them does things. This will keep records, generate reports, calculate things, put into action what you would have had to do with a pencil and paper after reading a book."

**M**anaging Your Money is but one of dozens of new home finance programs. Varying in sophistication from simple budget-balancers to full-blown financial forecasters, they may be one of the most practical software investments you can make, claim their publishers.

Softsync started out devel-

So they sat down with a bank manager who also happened to be a computer programmer and talked about what kind of features would be helpful to the typical home computer owner. The result was *The Personal Accountant* (available for the Commodore 64 on cassette and disk for \$29.95 and \$34.95; and for the IBM PC/PCjr and Apple IIe/IIc for \$49.95). *The Personal Accountant* keeps track of income and expenses with a double-entry bookkeeping system. "The process is really quite simple," says Currier. "You don't have to know anything about accounting. All you have to know is that money comes from one place and goes to another."

Another program, *Personal Money Matters*, by Avante-Garde Publishing Corporation, is designed to both simplify



Tom Measday, vice president of marketing and sales for Avante-Garde, says *Personal Money Matters* is aimed at people relatively new to computers, generally upper-middle class families. "The kind that keep decent financial records on paper," he explains. "The computer helps them do something they already know how to do."

**A** personal finance program may be one of the most difficult types of software to design—people have a tremendous variety of financial needs and ways of taking care of them. “It’s hard to make the software flexible enough that people can suit it to their





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# COOL

## INTRODUCING OKIMATE 10... THE FIRST

### The printer in a class by itself.

It's here! The new OKIMATE 10 Personal Color Printer. The first color printer that lets you show off and tell all. The printer that lets you print all the information you can create with your Atari® or Commodore® computer. But with the remarkable ability to create original drawings and graphics as well, in over 26 beautiful colors.

A class act! The OKIMATE 10 gives you crisp, clean term papers, school reports and homework. Word processing capability means everything you do can be printed letter quality in minutes, instead of typed in hours. OKIMATE 10

color gives you the opportunity to print graphs, charts and pictures from popular graphics and drawing programs. OKIMATE 10's brilliant color means you'll shine, every time.



### OKIMATE 10 feels right at home. Anywhere.

A special PLUG 'N PRINT™ package lets you plug your new OKIMATE 10 into your Atari or Commodore computer. And print. It's that easy. In minutes you'll be printing everything from soufflé recipes to needlepoint patterns. Party invitations to kitchen inventory. Love letters to gardening directions. At 240 remarkable words per minute. And not just in black and white, but in over 26 brilliant colors!

### Financial statements will keep you tickled pink for very little green.

If you use your personal computer to keep track of mortgage payments, tuition payments, balance your checkbook or jump ahead of the Dow Jones\*, there's good news for you. You'll find that the new OKIMATE 10 gets down to business quickly. And easily.

A "Learn-to-Print" diskette and tape shows you how to set up your new personal color printer and start printing. A complete OKIMATE 10 Handbook will show you how you can take your imagination to places it's never been before.



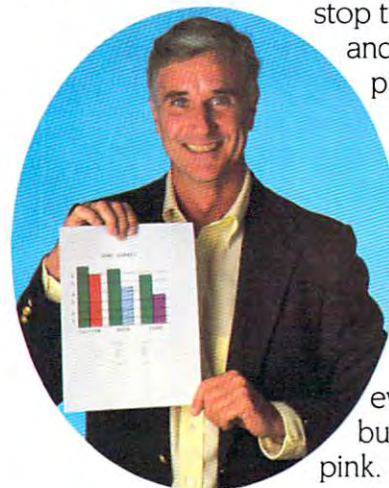


# FOR

## PERSONAL COLOR PRINTER UNDER \$250.

And while your imagination is soaring, you'll be glad to know that your new printer can keep right up with it! The new OKIMATE 10 is built with the same tradition of quality and manufacturing excellence that has made Okidata the most respected name in computer printers. Okidata craftsmen specially designed and engineered the new OKIMATE 10 to be incredibly small and lightweight. And they made it quiet as a whisper. But their imagination didn't

stop there. To help you and your personal computer keep within your personal budget, they made the OKIMATE 10 available at retailers everywhere for less than \$250. Something that should make every personal budget tickled pink.



patible with a variety of software packages that will run on your Atari and Commodore with a simple disk drive. Just load and you're off and running. Plotting charts. Designing special graphs. Creating original illustrations and pictures. Drawing special graphics. And printing them all beautifully for everyone. On most kinds of paper. In over 26 beautiful colors!



### Color your world.

If you've been playing games on your personal computer, now you can get serious and still have fun. The new OKIMATE 10 is completely com-





# QUESTIONS & ANSWERS

**Q: Why do I need a printer?**

**A:** You might as well ask, "Why do I need crayons?" When it comes to communicating, "putting it on paper" is still the best way to get your message across. You can have lots of computer equipment, but without the OKIMATE 10, it doesn't mean very much. Unless you get your letter, report, term paper or party invitation off the screen and down on paper, nobody's going to see it.

**Q: What makes the OKIMATE 10 better than any other printer?**

**A:** Because the OKIMATE 10 is unlike any other printer. First, it prints in COLOR. Up to 26 beautiful colors. Second, it prints up to 240 words a minute, so quietly you can talk in a whisper right next to it and still hear every word! And third, it prints letter quality, every time.

**Q: What about graphics and pictures?**

**A:** The OKIMATE 10 does it all. Graphs, charts, symbols, pictures, illustrations, and special drawings! With a compatible drawing package, anything you create on your screen can be printed in full color; a disk drive is required for color screen printing.

**Q: What kind of paper can I use?**

**A:** Just about any kind of smooth paper you want. From continuous feed computer paper to single sheets. From mailing labels to plastic acetate for overhead transparencies, the OKIMATE 10 prints crisp, clean, colorful images you'll be proud to send to friends, teachers, business associates, or frame and hang right in your own living room!



**Q: Is the OKIMATE 10 easy to use?**

**A:** As easy as "PLUG 'N PRINT!" No other printer is easier to use than the OKIMATE 10. Connecting the printer to your Commodore or Atari computer is, literally, a snap. The exclusive PLUG 'N PRINT package snaps into the printer. One cable connects it directly to your computer or disk/tape drive. Turn it on and you're in business. Once your OKIMATE 10 is up and running, the "Learn-to-Print" software program (included) teaches you printer basics—the "Color Screen Print" disk (also included) automatically prints everything on the screen in a single stroke. As a matter of fact, most of your printing can be done with just one command.

**Q: What's the printer like in operation?**

**A:** In one word: easy! Incredibly easy! The ribbon comes in a "Clean Hands" cartridge. So it's as easy to change as the tape in your audio cassette player.



**Q: What about reliability?**

**A:** Okidata has built the reputation of its complete line of printers on quality, dependability and rugged construction. The OKIMATE 10 is no exception. Don't let its light weight and compact size fool you. This printer is not a toy. It's a workhorse.

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needs," says Tobias. "If it's too rigid, you'll hit only a certain amount of people who want to do it your way. You have not only the complication of the computer, which is daunting, but most people find personal finance daunting."

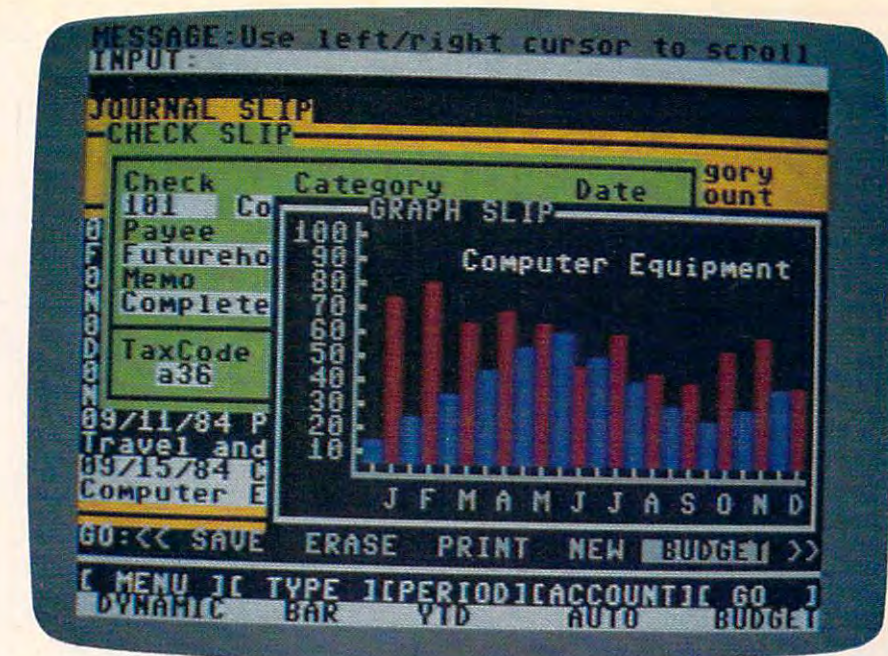
Yet, Tobias doesn't advocate a separate program for each purpose. "Any program that just does one thing, especially if it's just a checkbook program, is a toy. You don't need a computer to balance your checkbook. The bank has a very big computer that does a good job itself of balancing things."

(Besides, Tobias confides, you don't really need to balance your checkbook. "I never balanced a checkbook in my life. I just look to make sure all the checks are mine—I once got 15 checks from a Chinese laundry—and that no one has forged my signature. And I take a very quick look down to see that all my deposits have been credited. You know in a vague sort of way what the balance is supposed to be.")

Because people's financial needs and options constantly change, most publishers of financial software frequently revise their packages. "Actually, any good software product should be updated every 12 to 18 months," says Avante-Garde's Measday. "You not only need to ask people upfront what they want by doing extensive beta-testing [testing software with consumers], but you need to keep checking along the way."

Software publisher Futurehouse tackles that problem by mailing bimonthly newsletters to its customers and maintaining a technical support hotline. Futurehouse recently released the third version of its popular Commodore program, *The Complete Personal Accountant*.

To ease the transition from shoebox accounting to home



*Futurehouse's Complete Personal Accountant brightens up bookkeeping with lavish use of color graphics and overlapping screen windows.*

computer accounting, the latest version of CPA incorporates lots of graphics, windows, and icons. It even uses screen graphics to make checks, deposit slips, and credit card receipts look like their paper counterparts.

"What's wrong with making a check look like a check?" asks Andrew Hock, vice president of Futurehouse.

"I think you're going to see a lot more financial packages using things like icons and windows in the future," adds Hock. "They're a lot more user-friendly, and they require less documentation. After all, that was the whole idea behind the Macintosh."

**H**ome finance software won't make you rich, and it won't automatically run your household, either. You'll still need to spend some time filling in the blanks on the screen. That's the chief drawback of most checkbook-balancing programs. It's far

more work to enter all the data into the computer than it is to keep your checks on file and balance your books with a pocket calculator.

For a personal finance program to be practical, the benefits must outweigh the labor required. Entering information "has to be very fast. Otherwise, why bother?" says Softsync's Currier. "At the end of the month, you should be able to sit down with all your receipts and within 20 to 30 minutes have everything in, maybe run a couple of reports and see where you are each month."

"It's worth it," says Andrew Tobias, "even if someone only uses it five or six times a year, maybe for tax hypotheses and rental property analysis. For those people, it would basically be the ultimate pocket calculator. But for most people, I would hope they'd use it once a week. You can get the same work done as before, but it will be under control, instead of having the whole thing pile up in a shoebox."



There are dozens of personal finance programs, and space doesn't permit us to list all of them. But here's a selection of what's available for various brands of computers.

**The Home Accountant**  
Arrays, Inc./Continental Software  
11223 S. Hindry Avenue  
Los Angeles, CA 90045  
IBM PC \$150.00; PCjr \$74.95; Apple II series, TRS-80, Atari, and Commodore 64 \$74.95.

**Personal Money Matters**  
Avante-Garde Publishing Corporation  
P.O. Box 30160  
Eugene, OR 97403  
Apple II series \$79.95; IBM PC \$99.95; soon available for Commodore 64.

**Dow Jones Home Budget**  
Decision Support Software, Inc.  
and Dow Jones & Co., Inc.  
Dow Jones & Co., Inc.  
P.O. Box 300  
Princeton, NJ 08540  
IBM PC \$139.00

**Financial Cookbook**  
Electronic Arts  
2755 Campus Drive  
San Mateo, CA 94403  
IBM PC/PCjr, Apple II series, Commodore 64, and Atari \$50.00

**Complete Personal Accountant**  
Futurehouse  
P.O. Box 3470  
Chapel Hill, NC 27514  
Commodore 64 \$79.95; \$20.00 additional for technical support.

**Managing Your Money**  
Micro Education Corporation of America  
285 Riverside Avenue  
Westport, CT 06880  
Apple IIe/IIc, IBM PC/PCjr \$199.95.

**MicroCheck**  
Microbits Peripheral Products  
225 3rd Avenue S.W.  
Albany, OR 97321  
Atari and Commodore 64 \$49.95.

**Dollars and Sense**  
Monogram  
8295 La Cienega Boulevard  
Inglewood, CA 90301  
IBM PC/PCjr \$179.95; Apple Macintosh \$149.95; Apple IIc \$119.95; Apple II/II+ /IIe \$100.00

**Your Personal Net Worth**  
Scarborough Systems, Inc.  
25 N. Broadway  
Tarrytown, NY 10591  
IBM PC/PCjr \$99.95; Apple II series, Commodore 64, and Atari \$79.95.

**The Personal Accountant**  
Softsync, Inc.  
14 E. 34th Street  
New York, NY 10016  
IBM PC/PCjr, Apple IIe/IIc \$49.95; Commodore 64 disk \$34.95 and cassette \$29.95.

**64-Accounting System**  
Software Design, Inc.  
P.O. Box 570  
Waterloo, IA 50704  
Commodore 64 \$69.95.

**Money Manager**  
Timeworks  
P.O. Box 321  
Deerfield, IL 60015  
Commodore 64 \$24.95; IBM PC/PCjr \$59.95; Apple II series \$39.95. ©

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Letter Wizard is an ideal word processing program for even the most serious wordsmith in your family. It boasts a spelling checker and compatibility with all popular printers. Nice thing is, commands are a whiz to learn and perform.

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Compose and edit right on the screen. At the stroke of a key, you can move, delete, insert, search and replace words and paragraphs like...well, magic.

## Easy speller.

Letter Wizard includes a spelling checker which allows easy in-line corrections of over 33,000 words. And you can even create custom dictionaries of your own special words. Have we got you under our spell yet?



## Easy buyer.

OK, a powerful program like this must cost a powerful lot of money, right? Stuff and nonsense. Even though Letter Wizard offers more than most, it costs less than most. And that's no voodoo.

For Commodore 64, Apple II and Atari systems.

**Letter Wizard™ with  
Spelling Checker  
by  
Datasoft®**



## A young girl with pigtails, wearing a red and white striped shirt and a red skirt, sits on a wooden crate. She is wearing white socks with red stripes and white sneakers with red laces. She is looking down and holding her knees.

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# MSX IS COMING

## Part 1

Tom R. Halfhill, Editor  
Selby Bateman, Features Editor

More than a dozen consumer electronics and computer companies—primarily Japanese—are gearing up to enter the U.S. market in early 1985 with new inexpensive home computers designed around the so-called MSX standard. What is MSX, and what does it mean for American computer companies, software publishers, and consumers? We'll examine these questions in this first installment of a special two-part series.

A giant silicon-based question mark is rising on the Far Eastern horizon. The shadow it casts is stalking the U.S. home computer industry, and millions of dollars in future sales hang on how far it creeps. Depending on your point of view, it will either brighten the market for everybody or darken the future for American competitors. One way or the other, its arrival on these shores will help determine the course of the consumer electronics and home computer industries for years to come.

The question mark is something called MSX, and it's an enigma waiting for answers. Will it signal the first successful Japanese invasion of the U.S. home computer market? Will it establish the long-awaited standard among home computers? Will it banish the confusion over home computing and make computers as widely accepted and popular as TV sets and

stereos? And finally, how will American manufacturers react to the Japanese invaders? Will they try to beat them, or shrug their shoulders and join them?

Mindful of past Japanese takeovers (or near-takeovers) of the U.S. camera, motorcycle, audio, video, auto, and steel industries, the leading American computer firms are watching MSX very closely. Powerful Japanese consumer electronics companies with such familiar names as Sony, Yamaha, Panasonic, Sanyo, Hitachi, and others have been planning their MSX strategies for more than a year and a half. Their target: the tens of millions of Americans who still haven't bought a home computer, plus millions more who perhaps already own a computer but are confused and frustrated by a mishmash of conflicting nonstandards and incompatibilities.

The secret weapon of MSX is its answer to the dream of

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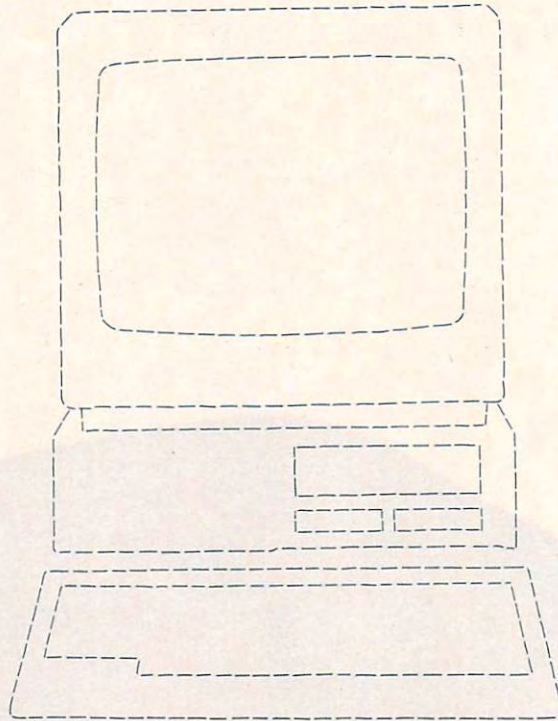


For personal computers that  
have been very, very good this year...





Picture a computer under \$1000  
that runs over 1000 of the best programs  
written for the IBM PC.





# Now picture this.

There's a lot that's new about PCjr and it's all good news for you.

PCjr now has a lower price. A new typewriter-style keyboard.

A new option that can give

user memory a dramatic boost.

And new business and personal programs to add to its fast-growing library of up-to-date programs.

All of which can make PCjr the most useful computer a little money can buy.

It comes standard with 128KB of user memory—twice the memory of its most popular competitor. An advanced 16-bit processor. And a double-sided diskette drive that can store over twice as much information as most single-sided drives.

With all these features, PCjr can run over a thousand of the most popular programs written for the IBM PC. And with the new optional 128KB Memory Expansion Attachment,

it can run over a thousand more.

PCjr also runs a growing number of powerful cartridge programs. They work faster than



Right now, PCjr can run the powerful Lotus 1-2-3™ on diskette (with Lotus 1-2-3 PCjr Installation Kit and additional memory). The new cartridge version, requiring no additional memory, will be available this fall.



Managing Your Money™ by Andrew Tobias, new on cartridge for PCjr, is a comprehensive personal financial advisor and manager.



Turn your screen into a canvas. The new cartridge program, PCjr ColorPaint, lets you create with the added dimension of color.



diskettes, and don't take up a bit of user memory. The three newest examples being Lotus 1-2-3,™ the fascinating PCjr ColorPaint and Managing Your Money™ by financial expert Andrew Tobias.

As its library of software keeps growing, PCjr keeps growing, too. By leaps and bounds. Because IBM designed it with 13 ports for add-on options. And a modular construction that will accept new capabilities down the road. Even those that haven't been invented yet.

All this in a

computer that weighs a mere 10 pounds.\*

Takes up just a bit over a square foot of desk space. And costs less than \$1,000†,

without monitor.

Picture yourself

Try one out

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new at an

authorized

IBM PCjr

dealer or IBM Product

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For the name of the store nearest you, call 1-800-IBM-PCJR. In Alaska and Hawaii, call 1-800-447-0890.



The new PCjr Memory Expansion Attachment can give memory a quick lift to 256KB. Or, along with a PCjr Power Expansion Attachment, all the way to a hefty 512KB.

## More computer for your money.

See how PCjr compares with other computers at its price.

Memory	Software
User Memory (RAM): 128KB (expandable to 512KB)	Runs over 1,000 programs written for the IBM PC
Permanent Memory (ROM): 64KB	Runs both diskette and cartridge programs
Diskette Drive	Display
Double-sided, double density	40- and 80-column
Capacity: 350KB	Resolution:
	4-color: 640h x 200v
	16-color: 320h x 200v
Processor	Expandability
16-bit 8088	Open architecture
Keyboard	Optional 128KB Memory Expansion Attachment(s)
Typewriter-style	13 ports for add-ons, including built-in serial interface
Detached; cordless	
Warranty	
1-year limited warranty	



PCjr's new typewriter-style keyboard adds a nice touch to business, home or educational computing.

# IBM PCjr

Growing by leaps and bounds.

Managing Your Money is a trademark of MECA. 1-2-3 and Lotus are trademarks of Lotus Development Corporation.

\*Weight does not include power pack and monitor. †IBM Product Center price.

Little Tramp character licensed by Bubbles Inc., s.a.

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practically everyone who has tried to piece together a computer system with today's hardware and software. MSX is a true standard—a coordinated system of hardware and software that is fully compatible across the product lines of competing manufacturers. The beauty of MSX is that any software program on tape, disk, or cartridge which runs on one MSX machine will run on any other. You can plug a Sony MSX program cartridge into a Yamaha or Panasonic MSX computer and it works exactly the same. Or pop a Sanyo MSX tape or disk into a JVC or Hitachi MSX computer. No emulators, no adapters, no confusion.

MSX peripherals are compatible, too. Disk drives, tape drives, printers, modems, joysticks, light pens—any accessory which adheres to the sharply defined MSX standard can be hooked up to any MSX computer. While American consumers and software publishers have had to wrestle with the mutually incompatible systems of Apple, Commodore, Atari, IBM, TRS-80, and others, MSX introduces a common, unified system.

What's more, MSX even offers some compatibility with popular de facto standards. The disk operating system, MSX-DOS, was written by the author of MS-DOS and is format-compatible with MS-DOS. That means an MSX computer can read disks formatted on an IBM PC or PC-compatible. MSX-DOS works almost exactly like MS-DOS, too. MSX-DOS also can run most programs written for the CP/M-80 operating system (opening up a library of thousands of programs, mostly business-oriented). And MSX BASIC is a very powerful and complete language which closely resembles IBM PCjr Cartridge BASIC and TRS-80 Color Computer Extended BASIC.

Most important, MSX isn't just a prototype or an untested product. The first generation of MSX computers made their debut in Japan in November 1983, and by midsummer 1984 more than 265,000 units had been sold, capturing a significant share of Japan's low-end home computer market. Now MSX is moving into Europe. The U.S. market, potentially the most lucrative, is next.

## *One of the main criticisms of MSX is that it's technologically obsolete compared to the newer 16- and 32-bit personal computers.*

**O**n the surface, the MSX concept might appear quite simple. Yet there are interesting paradoxes. First, although Japanese manufacturers are the strongest proponents of MSX, it's not owned by a Japanese company. It was developed by an American company, Microsoft Corporation (MSX stands for *Microsoft Extended*). The prime force behind MSX development was Kazuhiko "Kaye" Nishi, president of Microsoft's Far East Division. Nishi also cofounded the giant Japanese software and magazine publishing company ASCII-Microsoft, and designed the popular TRS-80 Model 100 portable computer.

Microsoft owns the rights to MSX and licenses the technology to the manufacturers. Since

Microsoft announced MSX in Japan in June 1983, it has sold licenses to 16 Japanese and Korean consumer electronics firms, one European electronics giant (Philips), and a U.S. computer company with factories in Hong Kong (SpectraVideo).

Microsoft, of course, is virtually a household name—if your household has a personal computer. It was founded in the mid-1970s by two young college students, Bill Gates and Paul Allen, who wrote the first commercial BASIC interpreter for a microcomputer (the Altair). Since then, Microsoft BASIC has become the standard built-in language on nearly all personal computers, including Commodore, IBM, Apple, TRS-80, and numerous others. Microsoft is also the company behind MS-DOS, the most popular operating system for 16-bit personal computers.

But the fact that Microsoft has always been at the cutting edge of a very fast-moving marketplace raises another paradox: It has based MSX on the Zilog Z80A microprocessor (an 8-bit central processing unit), the Texas Instruments 9918A video chip (16 colors, 32 programmable sprites), the General Instruments programmable sound generator (three channels, eight octaves), 32K of ROM, and 16K to 64K of internal RAM. The technology is solid, versatile, cheap—and old. In fact, one of the main criticisms of MSX is that it's technologically obsolete compared to the newer 16- and 32-bit personal computers starting to appear.

Ironically, however, the low-end MSX computers (which will probably sell for around \$200 or less) can be hooked up to everything from digital televisions and sophisticated light pens to powerful music synthesizers, laserdisc players, and a variety of other high-tech peripherals. If what really counts in a computer is not the

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*The GoldStar FC-200 MSX Personal Computer, a Korean creation. The keyboard layout is very similar on all MSX computers. Notice the editing keys, cursor keypad, and preprogrammed special function keys. The hatch at the upper right conceals the ROM cartridge slot. The hole next to it is a light pen holder.*

technology inside it, but the applications you can squeeze out of it, then the MSX machines may actually seem *more* advanced than today's home computers—especially to consumers who won't know an 8-bit chip from a Frito.

Experience in the marketplace lends credence to this theory. For instance, although Apple II-series computers have changed relatively little since 1977 and are as technologically obsolete as MSX computers, the vast selection of quality software and expansion hardware helps to keep the Apple IIe and IIc very popular, even at high-end prices. It's apparent that people perceive the value of a computer in the tasks it can perform, not the circuitry it's made of.

If this principle holds true for MSX machines, their old technology may not be a handicap. Who will worry about the 8-bit CPU if MSX home computers are the only ones on the market that can blend computer graphics and videodisc images on your TV screen for super-

realistic videogames and educational programs? Who will care about the limited three-channel tone generator if the MSX computers are the only ones that can be easily and economically converted into state-of-the-art polyphonic music synthesizers? Technical-minded hobbyists might care, but the MSX companies aren't hunting for that market. They have a much bigger game in mind.

**D**ated though it may be, the MSX technology will be tied to modern marketing strategies which could radically change the way home computers are sold. You can expect that part of this strategy will be to avoid the tiresome bits-and-bytes sales pitches and confusing comparisons that chase people out of the store. All the big MSX backers are consumer electronics companies, not computer companies. They're accustomed to mass-marketing TV sets, stereos, and videocassette recorders, and that's the way they'll try to sell MSX home computers.

Consider the sheer marketing strength of 18 companies selling what is essentially the same computer simultaneously. Industry observers were impressed earlier this year when IBM budgeted an estimated \$40 million for an advertising campaign to launch the PCjr. IBM is one of the few companies that could afford such a sum. Apple budgeted \$20 million to introduce the IIc, and even more for the Macintosh. Yet if the 18 MSX companies averaged, say, \$5 million each for advertising and promotion, it would have the same impact as a competitor's \$90 million campaign. If they each chipped in \$10 million, it would be a \$180 million campaign. When you figure in the MSX advertising from independent software publishers and the likelihood of additional MSX licensees, you can see why MSX is a marketing force to be reckoned with.

"The success of MSX really boils down to the number of companies that can, during a relatively short period of time, make their product introductions into the U.S.," says Ron Hisogi, manager of Far East business development for Microsoft. "In other words, having two companies selling MSX computers in the U.S. will not be as effective as if ten companies come here and say, 'We are here with these MSX machines. This is what our respective products do.' That would carry a lot more weight. Critical mass is really a key to making sure MSX takes off."

Most, but not necessarily all, of the 18 MSX companies will probably market MSX computers in the U.S. next year. Microsoft would like to see them enter the U.S. market soon, and indications are that it will most likely happen at the January 1985 Consumer Electronics Show (CES) in Las Vegas. At last June's CES in Chicago, MSX machines were

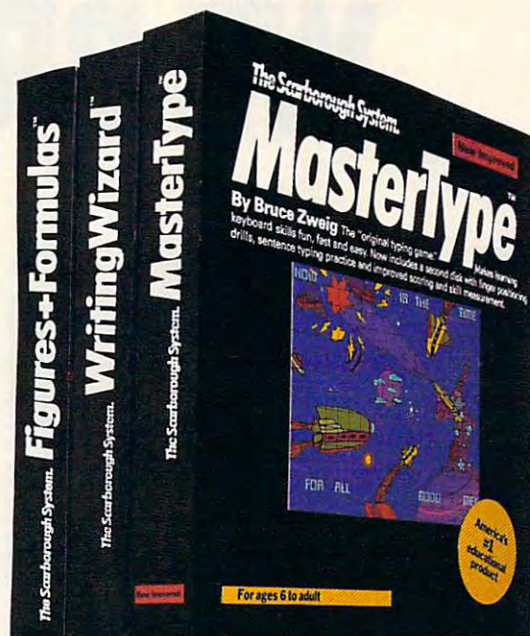
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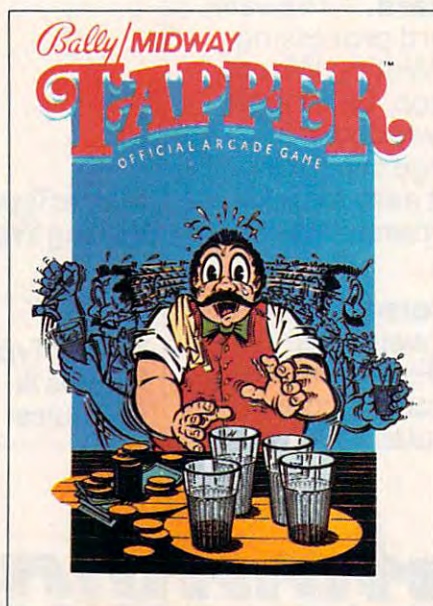
Bally Midway's *Up 'N Down* by Sega. In this game, a crash is no accident.

In fact, it's the whole object of the game. You'll race your baja bug over some of the worst roads south of any border. Leap dead ends, gaping canyons and oncoming traffic in a single bound. And if anyone gets in your way, crush 'em.

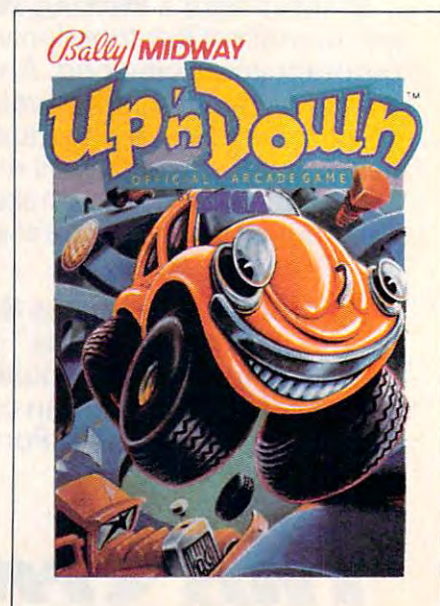
Crashing, bashing *Up 'N Down*. It's one smash hit that really is a smash.



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#1 Arcade Hit, *Play Meter* Conversions Poll, 8/1/84



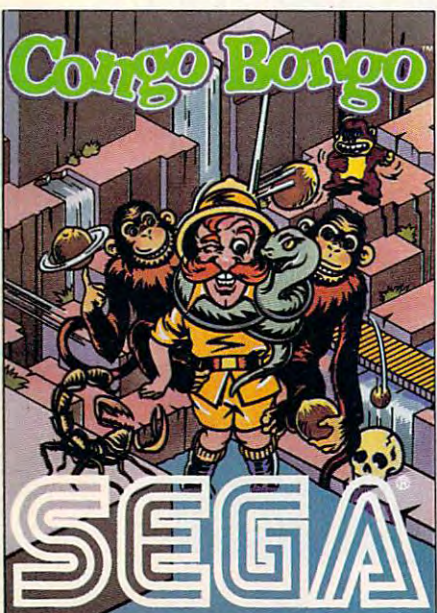
# WERE SUCH BIG HITS, THEM HOME.



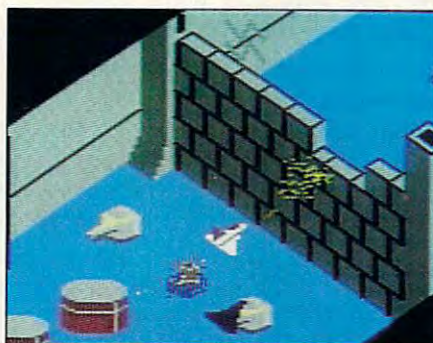
Sega's Congo Bongo rocked the home game world when it shot up to Number 3 on the Billboard chart this spring.

And now it's available for even more home systems. So check the chart and get ready for jungle action. You'll pursue the mighty ape Congo up Monkey Mountain and across the Mighty River. Do battle with dangerous jungle creatures. Ride hippos, dodge charging rhinos and try to avoid becoming a snack for a man-eating fish.

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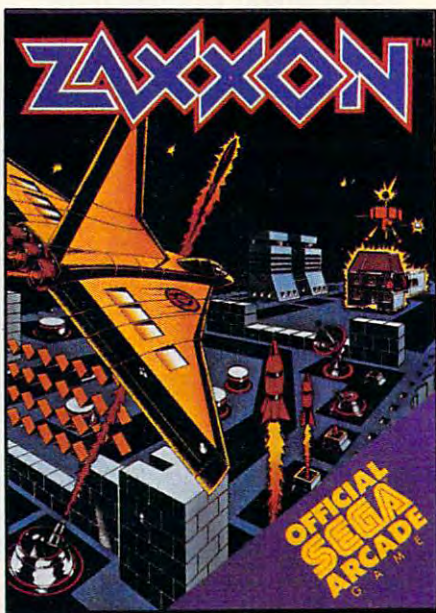
Arcade and Home Smash. Hit #3 on Billboard magazine's Top Video Games survey.



Sega's Zaxxon. If you haven't played Zaxxon, you must have been living on another planet for the past few years.

And now the ultimate space combat game is available for even more home systems. You'll pilot a space fighter through force fields and enemy fire on your way to do battle with the mighty Zaxxon robot. Countless others have gone before you in this Hall of Fame game. But this time your life is in your own hands.

Zaxxon killed them in the arcades. But compared to what it will do to you at home, that was child's play.



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	SPY HUNTER	TAPPER	UP 'N DOWN	CONGO BONGO	ZAXXON
Atari 2600 cartridge	✓ NEW	✓ NEW	✓ NEW	✓	✓
Atari 5200 cartridge				✓	NEW
Atari Computers* cartridge	✓ NEW	✓ NEW	✓ NEW	✓	NEW
Atari Computers† diskette	✓ NEW	✓ NEW	✓ NEW		✓
ColecoVision & ADAM cartridge	✓ NEW	✓ NEW	✓ NEW	✓ NEW	✓
Commodore 64 cartridge	✓ NEW	✓ NEW	✓ NEW	✓	NEW
Commodore 64 diskette	✓ NEW	✓ NEW	✓ NEW	✓ NEW	✓
Apple II, IIe, IIc diskette	✓ NEW	✓ NEW	✓ NEW	✓ NEW	✓
IBM PC diskette	✓ NEW	**	✓ NEW	**	**

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 \*Atari 400, 800, 600XL, 800XL and 1200XL.  
 (Congo Bongo cartridge: 400, 800 and 800XL.)  
 †Atari 800, 600XL, 800XL and 1200XL.  
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All new games are scheduled to be in your stores for Christmas. Check your local dealer.

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already on display at booths run by three Korean manufacturers—Daewoo, GoldStar, and Samsung—and a Japanese company, JVC. One evening during CES, Microsoft held a private showing of Japanese MSX machines for selected third-party developers at Chicago's chic Javon Restaurant. The party, hosted by Microsoft's Bill Gates, also was intended to lure more manufacturers into the fold.

To date, the MSX licensees include the three Korean companies mentioned above, Philips (The Netherlands), Spectra-Video, and the following Japanese consumer electronics firms: Canon, Fujitsu, General, Hitachi, Kyocera, Mitsubishi, Matsushita (also known as National or Panasonic), Pioneer, Sanyo, Sony, Toshiba, Victor (JVC), and Yamaha.

Do most of those names sound familiar? They should. They practically dominate the U.S. market for TV sets, audio equipment, videodisc players, videocassette recorders, and other consumer products. And the companies themselves are banking on that name recognition, too.

**S**ome critics spot a potential flaw in the ambitious MSX marketing strategy. What if the unified approach and attempt to establish a true standard backfires? How can so many manufacturers compete by selling the same computer?

The MSX companies have a response: the same way they compete by selling TV sets, stereos, VCRs, cameras, and other virtually identical consumer products. Each computer will be slightly differentiated by extra features or enhancements which are related to the company's particular strengths in the consumer electronics field.

Yamaha, for example, will offer an optional plug-in music synthesizer and piano-style key-

board which converts its MSX YIS503 computer into the equivalent of a sophisticated Yamaha DX7 polyphonic music synthesizer. The computer becomes a real musical instrument which puts even the Commodore 64 SID chip to shame. And if you can't play a note, don't worry; an optional bar code reader lets you feed popular tunes into the synthesizer for playback. Then you can modify the music almost any way you want, changing the beat, tempo, pitch, or instrumentation. If you want to play along, you can do that too—a keyboard display on the screen even shows beginners which note to play next.

The General Corporation, a Japanese firm known for its high-quality TV sets, has another angle. It manufactures a TV with a built-in MSX computer. "You plug a detachable keyboard into it and it turns into an MSX machine," explains Microsoft's Hisogi. "The nice thing is that the cartridge slot, the printer port, and all of that are integral parts of the TV set itself." The 14-inch TV, selling in Japan for the equivalent of about \$550, houses the tuner and MSX system behind a three-inch panel below the screen.

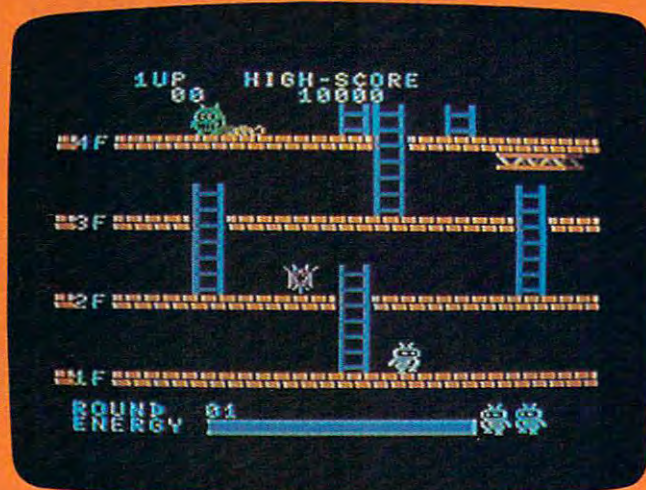
Sanyo might emphasize its

high-quality light pen system with the MPC-10 32K computer. Sony's HitBit 64K machine has built-in productivity software. Pioneer's Palcom PX-7 contains a video interface which mixes computer graphics and laserdisc images on the same screen. And the list goes on.

"Victor has an MSX machine [the 32K HC-6] that has an RGB transposing unit," says Hisogi. "You can actually take images created from a personal computer and superimpose them on an RGB monitor in conjunction with a videodisc player. It also has the capability to be used for a monitoring station to control your audio and video equipment."

In a recent demonstration at COMPUTE!, the Pioneer PX-7 MSX computer was interfaced with a laserdisc player. Using a joystick, you controlled a computer-generated space fighter (a sprite) while zooming through stunning scenes stored on the laserdisc. You could shoot at enemy spacecraft and maneuver through harrowing canyons on alien planets. It was like leaping into *Star Wars*. The images were every bit as good as those in the latest videodisc arcade games.

The PX-7, by the way, revealed something else about

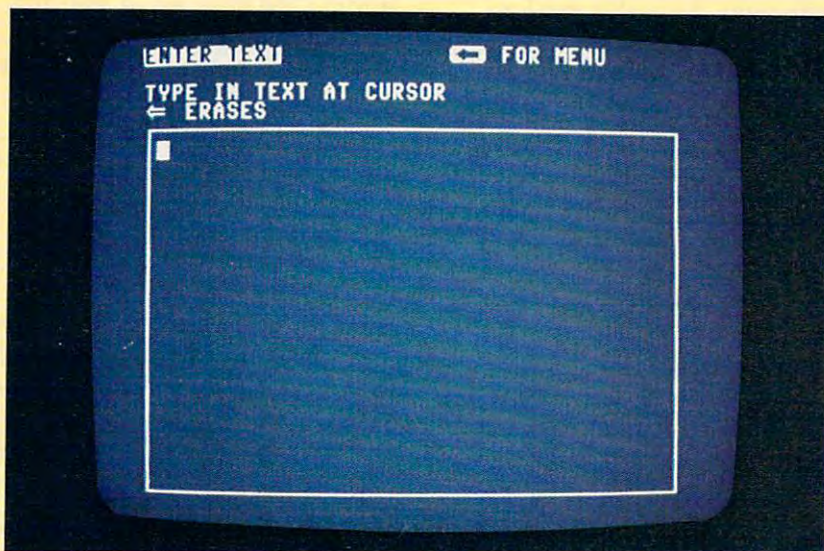


This screen photo from *Step Up*, a cartridge-based arcade game from GoldStar, shows an example of MSX graphics (the blurred images are fast-moving sprites which could not be frozen by the camera).



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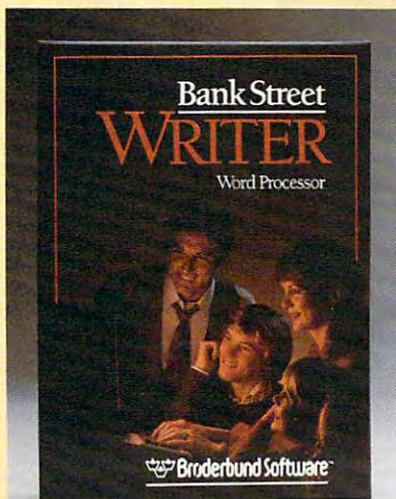
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MSX marketing strategy—it didn't resemble a traditional home computer at all. Rack-styled to match Pioneer's audio and video components, it looked more like a front-loading VCR or stereo receiver. To use it as a computer, you plug in a detachable keyboard on an extension cord.

**D**espite all the development work and market planning that has been invested in MSX, its success is hardly guaranteed. The U.S. home computer market is as volatile as it is lucrative; as many fortunes have been lost as won. In mid-1983, the sky seemed the limit. By mid-1984, the adolescent-like growth started leveling off as the industry matured. Experienced companies such as Texas Instruments and Mattel have been knocked out of the fight completely. Coleco is fighting

an uphill battle. Atari, which had everything going for it two years ago, is severely weakened. Even mighty IBM, which seemed a shoo-in last year, stumbled embarrassingly in the home market with its PCjr. Is MSX a year too late? Why has introduction into the U.S. been delayed until 1985?

"All of them [the Japanese companies] had one thing in mind, and that was to cultivate their own domestic marketplace—that's Japan," explains Hisogi. "The second reason, I believe, is because it's true that about the time MSX was introduced in Japan, the home computer market was going through a major shakeup, at least for the United States. I believe many Japanese manufacturers said, 'Well, let's wait and see until the dust settles.'"

As the U.S. marketplace continues to race along on its own course—with 64K home computers beginning to give

way to 128K machines, and 8-bit chips to 16- and 32-bit CPUs—many industry observers still contend that memory limitations and dated technology will doom the new MSX computers before they even arrive. Hisogi disagrees: "I don't think the manufacturers that are bringing MSX machines into the U.S. will even try to market 16K or 32K computers. They already have 64K machines . . . and adding RAM is not a big deal. I would suspect that they will study the competitive environment here and determine that no one practically sells any 32K or 16K machines. And I believe they will try to match their configurations to the point where they can effectively compete."

*Next month, Part 2 takes you inside MSX and reveals some of the technical features which make it a versatile, workable standard. We'll also analyze the performance of a typical MSX computer.* ©

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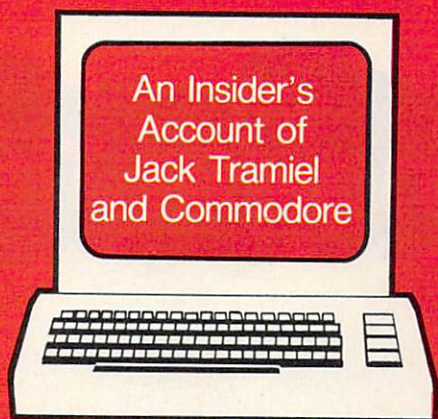
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# Things In The Dark

Scott Baker

*Can you wrest control of the Dark World from the norfs by capturing snakes, dinitis, blockheads, and pink graps? "Things In The Dark" is populated by a myriad of strange creatures and is paced for youngsters. Originally written for the Atari (16K RAM with tape, 32K RAM for disk), we've added versions for the Commodore 64; unexpanded VIC-20; Apple (at least 48K RAM); TI-99/4A; IBM PC (at least 64K RAM and color/graphics adapter); and PCjr. The Atari and Commodore versions require a joystick.*

You are in a strange Dark World populated by bizarre creatures. Your job is to keep this world free of gremlins, dinitis, blockheads, snakes, and pink graps. To accomplish this, you move your robot over these creatures. If you score 2500 points you are rewarded with another robot (except in the TI version).

Your adversaries in the Dark World are the terrible *norfs*, who can appear anywhere on the screen. They won't attack you directly, but if you bump into one, your robot and the norf will be zapped out of existence. As more and more norfs fill the screen, it becomes increasingly difficult to maneuver. Eventually, you may have to sacrifice a robot to escape from a ring of evil norfs, creatures whose rapacity cannot be overemphasized.

## Avoiding Turncoat Graps

All versions of "Things In The Dark" have their own instruction screens explaining the particular details of each program. But they share the same basic features. Each version has six levels of difficulty. The game automatically advances to higher levels at 5000-point intervals unless you select the No Advance option (which allows you to play the entire game at the same level). The robot in play always appears first at the center of the screen. A spare robot appears in the upper-

right corner of the screen, ready to jump into action should your current robot be done in by a norf.

Your score is recorded in the upper-left corner of the screen. Above the score is the grap count, which tells you how much time is left before a grap changes color. This is important because you gain points by running over a normal-colored grap, but you'll be destroyed by touching one that has changed color. (Grap colors vary in the different programs; also, the grap turns upside-down instead of changing colors in the Apple version.) The game's present level of difficulty is also displayed on the screen, along with the number of turns you have left. If the turn counter reaches zero, the game ends.

In the IBM, TI, and Apple versions, your robot moves continuously. Use the cursor keys to control direction in the IBM and TI versions; use I-J-K-L in the Apple version.

You can temporarily freeze the action on the Atari, Commodore 64, and VIC-20 versions by pressing the joystick button. Continue the game by pressing the button again. On the TI version, freeze by pressing P (for Pause) and continue by pressing R (for Restart). On the IBM version, freeze by pressing Ctrl-Num Lock on the PC or Function-Q (Pause) on the PCjr; continue by pressing a cursor key. On the Apple version, freeze by pressing CTRL-S; continue by pressing CTRL-S again.

To fit Things In The Dark into an unexpanded VIC-20, the VIC version is broken into two programs. Program 3 is the loader and Program 4 is the main program. Type in and save both programs before attempting to run the game. Save Program 4 with the filename V5. (If you're using cassette, be sure to save Program 4 immediately after Program 3 on the tape, and



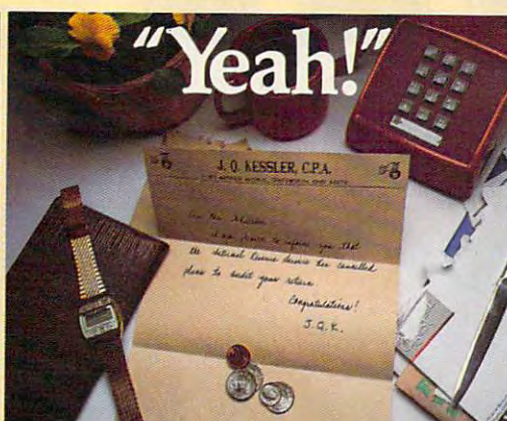
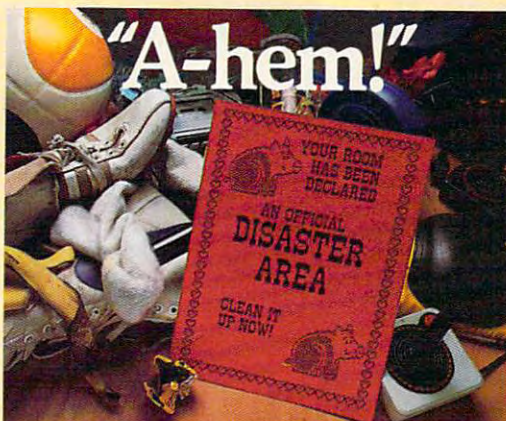
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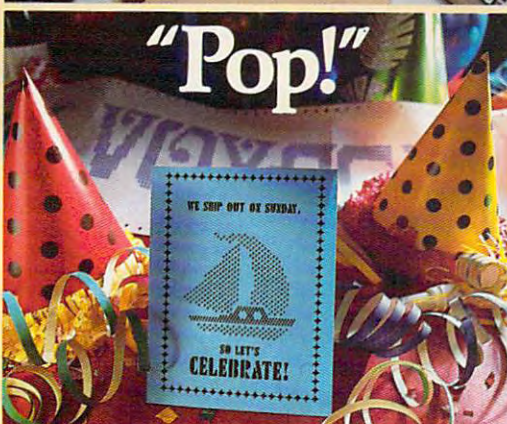
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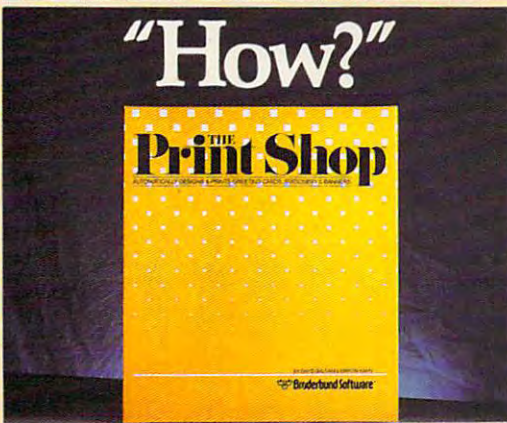
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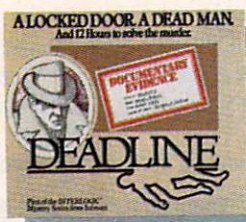


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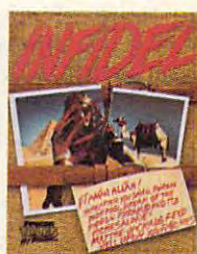
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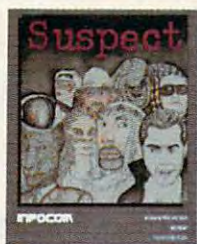
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change the 8 to a 1 in line 400 of Program 3.) Finally, run Program 3. It displays the instruction screens and automatically loads the main program from disk or tape.

## Atari Version Notes

When you run Things In The Dark, the screen will blank out for 13 seconds as the program initializes. Afterward you'll see the first of three instruction screens. Press SELECT to advance to the next screen or to return to the first screen from the final screen.

Type in the level you want when the menu appears on the third instruction screen. You can also press the OPTION button to choose the No Advance option. To begin the game, press START.

On the higher levels, you have fewer turns in which to score (only ten turns in level six). Also, turns will go by rapidly, fewer creatures will be plotted, and graps will stay pink for a shorter period of time.

Toward the end of the game, it's wise to open important channels by sacrificing a robot against a norf. After all, there's no point in having extra robots if the turn counter runs out. Remember that the robot can wrap around to the other side of the screen. You can safely pass over dinites, although no points will be earned. In addition, a norf will never appear on a space occupied by a dinit.

## Smart Snakes And Other Secrets

After playing Things In The Dark for a while, you may notice that the snakes never land on any green or orange creatures. Basically, the series of LOCATE statements in the snake subroutine (lines 350-434) tell the snake to check first for a space free of orange or green creatures in front of itself.

The variable D determines whether to go to the LOCATE routine from lines 380-389 or to the routine from lines 390-399. These routines move the snake right and left, respectively.

If there is a clear space in front of the snake, it moves to that space and the program returns to the main loop. If the space is occupied, the spaces below the snake and then above it are checked for a clear space. If both these spaces are occupied, the snake is stuck. The snake never reverses direction except when it reaches the left or right side of the screen.

Similar logic moves the grap, except that it avoids orange creatures and moves diagonally. DATA statement 2600 decides whether to pass control to line 560, 580, 600, or 620, where routines locate the first space to the lower right, lower left, upper left, and upper right, respectively. Also, unlike the snake, the grap only tries

to move once before control returns to the main loop.

Both the snake and the grap display a simple sort of simulated intelligence, and the logic behind them may be worth using in other games.

## Atari Version Variable Listing

SNK	Number to score before a new snake appears.
SNKCT	Flag set to one to prevent more than one snake from being onscreen at the same time.
E	Column position of the leftmost bonus robot.
XRBT	Number to score to earn a bonus robot.
TRNCT	Maximum number of turns left in which you must score to prevent the game from ending.
MN	Flag set to one when a string of dinites is plotted, preventing green things and norfs from being plotted.
INCRLVL	Automatically advances game to next level of difficulty when INCRLVL is less than SCORE and OP equals zero.
OP	Prevents levels from advancing when set to one.
EDCT	Controls number of times through inner main loop before a norf, dinit, or green thing is plotted. Set equal to LVL when grap first appears.
LVL	Maximum number of turns in which you must score for a given level of difficulty.
LEVEL	Level of difficulty.
D	Determines the direction the snake will travel.
ND	Determines the direction to plot a string of dinites.
COL, ROW	Horizontal and vertical position of robot.
SNKC, SNKR	Horizontal and vertical position of snake.
GRPC, GRPR	Horizontal and vertical position of grap.

## Program 1: Things In The Dark For Atari

Refer to "COMPUTE's Guide To Typing In Programs" before entering this listing.

```

DA 5 GOTO 2000
PH 10 GRAPHICS 17:POKE 756,B:POKE 71
    0,152:POKE 708,38
CH 20 COL=9:ROW=11:COLOR 162:PLOT CO
    L,ROW:SOUND 0,190,10,10
MA 50 SCORE=0:SNK=1000:SNKCT=0:E=20:
    XRBT=2500:TRNCT=LVL:MN=0:INCRL
    VL=5000
IJ 60 SOUND 0,0,0,0:GOSUB 723
JA 70 POSITION 0,1:?"#6;"5 0
    (5 SPACES)";":LEVEL;?"#6;" 1
    ";TRNCT
PO 80 POSITION 0,0:?"#6;"66"
AN 99 REM 100-190 MAIN LOOP
CL 100 EDCT=5:GOTO 500
NM 120 FOR CT=EDCT TO 1 STEP -1
AD 125 IF EDCT>5 THEN GOSUB 550
KE 130 W=0:GOSUB 200
JH 135 IF STRIG(0)=0 THEN 2700
EC 140 IF TRNCT=9 THEN COLOR 0:PLOT
    18,1
AO 145 POSITION 17,1:?"#6;TRNCT:TRNC

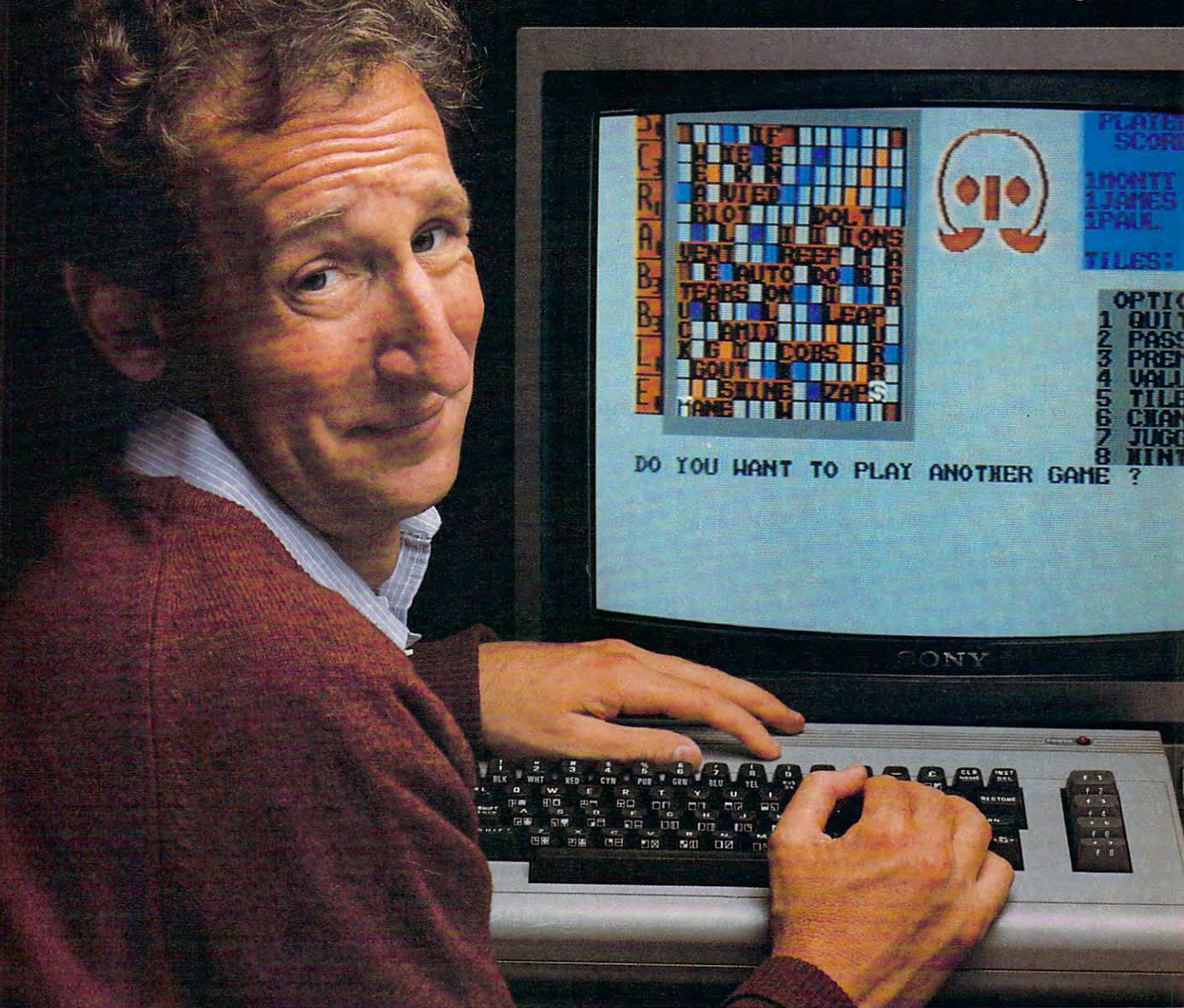
```



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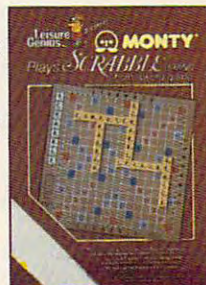
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Evading norfs in "Things In The Dark," Atari version.

```

T=TRNCT-1:IF TRNCT=-1 THEN 90
LE 150 IF EDCT=5 AND SCORE>=SNK THEN
    GOSUB 350
BE 160 NEXT CT:IF EDCT>5 THEN GOSUB
    750
AD 168 IF MN=1 THEN 445
NN 170 V=INT(20*RND(1)):H=INT(22*RND
    (1))+2:LOCATE V,H,P
NF 180 IF P=162 OR P>133 AND P<137 T
    HEN 170
KG 183 IF P=35 OR P=170 THEN 100
JM 185 R=INT((10*LEVEL)*RND(1)):IF R
    =0 THEN 440
MI 190 COLOR 35:PLOT V,H:GOTO 100
EE 199 REM MOVE ROBOT
MP 200 ST=STICK(0):IF W=LVL THEN RET
    URN
CO 210 IF ST=14 THEN 220
CO 211 IF ST=11 THEN 240
DO 212 IF ST=13 THEN 260
AJ 213 IF ST=7 THEN 280
OE 215 W=W+1:GOTO 200
LO 220 COLOR 0:PLOT COL,ROW
FJ 225 IF ROW=2 THEN ROW=24
GN 230 ROW=ROW-1:GOSUB 300
HK 235 RETURN
MA 240 COLOR 0:PLOT COL,ROW
CB 245 IF COL=0 THEN COL=20
DL 250 COL=COL-1:GOSUB 300
HM 255 RETURN
MC 260 COLOR 0:PLOT COL,ROW
FL 265 IF ROW=23 THEN ROW=1
GP 270 ROW=ROW+1:GOSUB 300
HO 275 RETURN
ME 280 COLOR 0:PLOT COL,ROW
FL 285 IF COL=19 THEN COL=-1
DN 290 COL=COL+1:GOSUB 300
IA 295 RETURN
AB 299 REM CHECK NEW ROBOT POS.,PLOT
    ROBOT & UP SCORE OR KILL ROB
    OT
CM 300 SOUND 0,190,10,10
NC 302 LOCATE COL,ROW,P:SOUND 0,0,0,
    0
HL 304 IF P=35 OR P=41 THEN 950
PD 306 IF P=4 THEN SCORE=SCORE+100:G
    OSUB 700:GOTO 330:REM BLOCKHE
    AD
GC 308 IF P=5 THEN SCORE=SCORE+10:GO
    SUB 700:GOTO 330:REM GREMLIN
IG 310 IF P=134 OR P=135 THEN SCORE=
    SCORE+200:SNK=SNK+1000:SNKCT=
    0:GOSUB 700:GOTO 670:REM SNAK
    E
CK 320 IF P=136 THEN SCORE=SCORE+400
    :EDCT=5:GOSUB 700:GOSUB 760:R
    EM GRAP
ED 330 COLOR 162:PLOT COL,ROW:RETURN

AG 349 REM SNAKE SUBROUTINE
OG 350 IF SNKCT=1 THEN 375
BJ 352 SNKC=INT(2*RND(1)):SNKR=5:SNK
    CT=1
LJ 354 IF SNKC=1 THEN SNKC=19:D=1
KJ 356 IF SNKC=0 THEN D=0
GG 360 LOCATE SNKC,SNKR,P
EB 362 IF P=4 OR P=5 OR P=35 OR P=16
    2 OR P=41 AND SNKR<24 THEN SN
    KR=SNKR+1:GOTO 360
EH 365 IF SNKR=24 THEN SNKCT=0:RETUR
    N
JG 370 IF D=0 THEN COLOR 134:GOSUB 4
    95:RETURN
JK 372 IF D=1 THEN COLOR 135:GOSUB 4
    95:RETURN
KL 375 IF D=1 THEN 390
ME 380 LOCATE SNKC+1,SNKR,P
CC 382 IF P=162 THEN 485
DN 383 IF P=4 OR P=5 OR P=35 OR P=41
    THEN 400
KL 385 COLOR 0:GOSUB 495
EG 387 SNKC=SNKC+1:COLOR 134:GOSUB 4
    95
PA 388 IF SNKC=19 THEN D=1:GOTO 400
IE 389 RETURN
MH 390 LOCATE SNKC-1,SNKR,P
CD 392 IF P=162 THEN 485
DO 393 IF P=4 OR P=5 OR P=35 OR P=41
    THEN 400
KM 395 COLOR 0:GOSUB 495
EK 397 SNKC=SNKC-1:COLOR 135:GOSUB 4
    95
LG 398 IF SNKC=0 THEN D=0:GOTO 400
IF 399 RETURN
NG 400 IF SNKR=23 THEN 488
LP 402 LOCATE SNKC,SNKR+1,P
BN 404 IF P=162 THEN 485
DL 406 IF P=4 OR P=5 OR P=35 OR P=41
    THEN 420
KH 408 COLOR 0:GOSUB 495
GM 410 SNKR=SNKR+1:IF D=1 THEN COLOR
    135
BN 412 IF D=0 THEN COLOR 134
NF 414 GOSUB 495:RETURN
KF 420 IF SNKR=2 THEN 488
MD 422 LOCATE SNKC,SNKR-1,P
BP 424 IF P=162 THEN 485
IH 426 IF P=4 OR P=5 OR P=35 OR P=41
    THEN RETURN
KJ 428 COLOR 0:GOSUB 495
HA 430 SNKR=SNKR-1:IF D=1 THEN COLOR
    135
BP 432 IF D=0 THEN COLOR 134
NH 434 GOSUB 495:RETURN
HA 439 REM 440-483 DINIT SUBROUTINE
CB 440 MN=1:COLOR 170:PLOT V,H:IF V<
    11 THEN ND=0:GOTO 120

```



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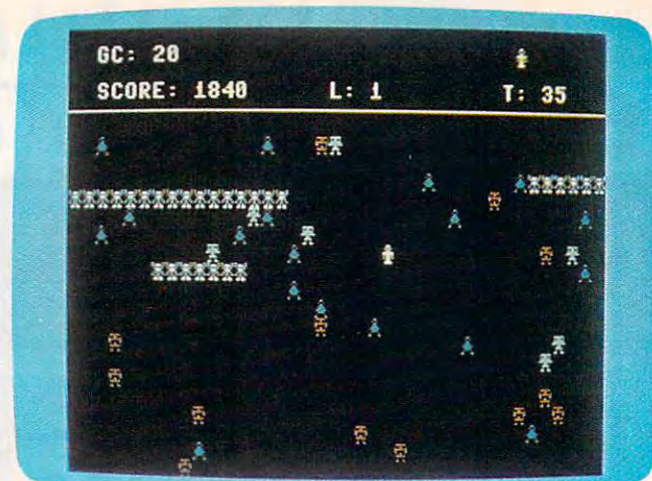
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```

KA 442 ND=1:GOTO 120
PE 445 IF ND=0 THEN 460
IM 448 IF V-1<0 THEN MN=0:GOTO 120
PF 450 LOCATE V-1,H,P
AM 453 IF P>133 AND P<137 THEN 120
PG 455 V=V-1:GOTO 482
MA 460 IF V+1>19 THEN MN=0:GOTO 120
PH 463 LOCATE V+1,H,P
AP 465 IF P>133 AND P<137 THEN 120
DA 470 V=V+1
HN 482 IF P=35 OR P=41 OR P=162 OR P=170 THEN MN=0:GOTO 100
PN 483 COLOR 170:PLOT V,H:GOTO 100
OE 485 SCORE=SCORE+200:GOSUB 700
GF 488 COLOR 0:PLOT SNKC,SNKR
NI 490 SNK=SNK+1000:SNKCT=0:GOTO 670
EJ 495 SOUND 0,130,10,12:PLOT SNKC,SNKR
IM 498 SOUND 0,0,0,0:RETURN
GB 499 REM GREMLIN & BLOCKHEAD ROUTINE
LD 500 GOSUB 545
PL 504 IF P=35 OR P=170 OR P=162 OR P=134 OR P=135 THEN 500
LK 510 SOUND 0,100,10,11:COLOR 5:PLOT V1,H1
FJ 520 J=INT((LEVEL+1)*RND(1)):SOUND 0,0,0,0:IF J>0 THEN 120
LI 523 GOSUB 545
PO 527 IF P=35 OR P=170 OR P=162 OR P=134 OR P=135 THEN 120
GC 530 SOUND 0,193,10,12:COLOR 4:PLOT V1,H1:FOR W=0 TO 5:NEXT W:SOUND 0,0,0,0:GOTO 120
AN 545 V1=INT(20*RND(1)):H1=INT(22*RND(1))+2
BL 548 LOCATE V1,H1,P:RETURN
MA 549 REM GRAP SUBROUTINE
PP 550 POSITION 4,0: ? #6;CT=W=0:IF CT=9 THEN COLOR 0:PLOT 5,0
HP 555 READ I:IF I=99 THEN RESTORE 2600:READ I
CD 557 GOTO I
IK 560 IF GRPR=23 OR GRPC=19 THEN RETURN
BN 563 LOCATE GRPC+1,GRPR+1,P
MF 564 IF P=35 OR P=41 THEN RETURN
LM 565 GOSUB 660
FO 568 COLOR 0:PLOT GRPC,GRPR
ON 570 GRPR=GRPR+1:GRPC=GRPC+1:GOTO 695
FC 580 IF GRPR=23 OR GRPC=0 THEN RETURN
CB 583 LOCATE GRPC-1,GRPR+1,P
MH 584 IF P=35 OR P=41 THEN RETURN
LO 585 GOSUB 660
GA 588 COLOR 0:PLOT GRPC,GRPR
PR 590 GRPR=GRPR+1:GRPC=GRPC-1:GOTO 695
BI 600 IF GRPR=2 OR GRPC=0 THEN RETURN
BM 603 LOCATE GRPC-1,GRPR-1,P
MA 604 IF P=35 OR P=41 THEN RETURN
LH 605 GOSUB 660
FJ 608 COLOR 0:PLOT GRPC,GRPR
OM 610 GRPR=GRPR-1:GRPC=GRPC-1:GOTO 695
FE 620 IF GRPR=2 OR GRPC=19 THEN RETURN

```



The robot is busy eliminating blockheads in this game of "Things In The Dark" on the Commodore 64.

```

BM 623 LOCATE GRPC+1,GRPR-1,P
MC 624 IF P=35 OR P=41 THEN RETURN
LJ 625 GOSUB 660
FL 628 COLOR 0:PLOT GRPC,GRPR
OM 630 GRPR=GRPR-1:GRPC=GRPC+1:GOTO 695
OD 660 COLOR 0:PLOT GRPC,GRPR:IF P=162 THEN SCORE=SCORE+400:EDCT=5:GOSUB 700:GOSUB 760:GOTO 120
IR 665 RETURN
PN 670 GRPC=INT(20*RND(1)):GRPR=22:EDCT=LVL:CT=EDCT
CE 675 LOCATE GRPC,GRPR,P:IF P=162 THEN 670
FH 680 COLOR 162:PLOT COL,ROW:RESTORE 2600
KE 695 SOUND 3,INT(150*RND(1))+25,10,10:SOUND 3,0,0,0
OG 698 COLOR 136:PLOT GRPC,GRPR:RETURN
JI 699 REM SCORE & LEVEL ADVANCE
RH 700 SOUND 0,65,10,8:POSITION 3,1: ? #6;SCORE:SOUND 0,0,0,0
GO 701 IF OP=1 OR SCORE<INCR LVL THEN 710
NO 703 IF LVL>10 THEN LEVEL=LEVEL+1:LVL=LVL-10:INCR LVL=INCR LVL+5000:POSITION 12,1: ? #6;LEVEL
CE 704 FOR W=80 TO 0 STEP -W/10:SOUND 0,W,10,10:POKE 712,2*W:FOR W1=0 TO W:NEXT W1
JJ 706 SOUND 0,0,0,0:POKE 712,0:NEXT W
CC 710 TRNCT=LVL:POSITION 17,1: ? #6;TRNCT:IF SCORE>=XRBT THEN 720
HN 715 RETURN
LF 719 REM EARN EXTRA ROBOT
EI 720 XRBT=XRBT+2500
GL 723 SOUND 2,243,10,12:POKE 77,0
CM 725 E=E-1:IF E=6 THEN E=7
MM 730 COLOR 162:PLOT E,0
BF 740 FOR W=0 TO 9:NEXT W:SOUND 2,0,0,0:RETURN
FI 750 EDCT=5:COLOR 41:PLOT GRPC,GRPR
EL 760 CT=0:POSITION 4,0: ? #6; " " :R

```



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```

ETURN
AA 800 POKE 708,38:COLOR 0:PLOT E,0
GH 810 E=E+1:PLOT COL,ROW:COLOR 162:
COL=9:ROW=11:PLOT COL,ROW:GOT
O 100
JB 900 POSITION 0,10: ? #6;"LEVEL ";L
EVEL;" YOU FAILED TO SCORE 0
";LVL;" TURNS":GOTO 1000
IC 950 SOUND 0,255,8,12:POKE 708,104
:IF EDCT>5 THEN GOSUB 750
JM 960 FOR W=0 TO 50:NEXT W:SOUND 0,
0,0,0:IF E<20 THEN 800
IH 1000 FOR W=1 TO 100 STEP 5:SOUND
0,W,10,10:NEXT W:SOUND 0,0,0
,0:POSITION 6,4: ? #6;" THE G
RAPHICS
PK 1010 OPEN #2,4,0,"K:"
BL 1025 POSITION 1,16: ? #6;"PRESS:
(33 SPACES)select instructio
nsstart(3 SPACES)begin game
"
BJ 1030 IF OP=0 THEN POSITION 0,20: ?
#6;"option advance
(5 SPACES)level every 5000 p
ts":GOTO 1045
PA 1040 POSITION 0,20: ? #6;"option
no advance level every 5000
pts"
FA 1045 POSITION 0,22: ? #6;"
(20 SPACES)"
OE 1050 POSITION 0,23: ? #6;"choose 1
evel ";CHR$(17);CHR$(13);CHR
$(22);CHR$(26);" ";LEVEL
CA 1060 IF PEEK(764)<255 THEN GET #2
,K:IF K>ASC("0") AND K<ASC("
7") THEN LEVEL=K-48:LVL=70-(
LEVEL*10)
HF 1070 IF PEEK(53279)<>3 THEN 1100
NI 1080 IF OP=0 THEN OP=1:GOTO 1040
NI 1090 IF OP=1 THEN OP=0:GOTO 1030
HD 1100 IF PEEK(53279)=5 THEN CLOSE
#2:GOTO 2100
BD 1110 IF PEEK(53279)=6 THEN CLOSE
#2:GOTO 10
MB 1120 GOTO 1030
KA 1999 REM STEAL & MODIFY CHARACTER
SET
JD 2000 POKE 559,0:DIM S$(1024)
DN 2010 A=ADR(S$):B=INT(A/512+1)*2:C
BASE=B*256-A+1
JL 2020 FOR I=0 TO 511
PI 2040 S$(CBASE+I,CBASE+I)=CHR$(PEE
K(I+57344)):NEXT I:H=16:V=23
IO 2060 FOR CT=0 TO 8
HH 2070 FOR I=H TO V
KH 2080 READ W:S$(CBASE+I,CBASE+I)=C
HR$(W):NEXT I:V=V+8:H=H+8
IM 2090 NEXT CT:LVL=60:LEVEL=1
PB 2100 GRAPHICS 17:POKE 756,B:POKE
710,152:POKE 708,38: ? #6;" t
hings in the dark "
KD 2110 ? #6;" LAND THE ROBOT ";CHR$(
162);" ON"
HH 2120 ? #6;"GREMLINS...";CHR$(5);"
10 PTS": ? #6;"BLOCKHEADS."
;CHR$(4);" 100 PTS"
BE 2130 ? #6;"SNAKES...";CHR$(134)
;" 200 PTS": ? #6;"PINK GRAPS
.";CHR$(136);" 400 PTS"
JB 2140 ? #6;" AVOID THE NORFS ";CHR
$(35);" BOTH THE ROBOT AND
THE NORF VANISH WHEN THEY TO
UCH."
LO 2150 ? #6: ? #6;" TOUCHING AN ORAN
GE GRAP ";CHR$(41);" IS LIKE
(6 SPACES)TOUCHING A NORF."
HJ 2160 ? #6: ? #6: ? #6;"(4 SPACES)pr
ess select(8 SPACES)to conti
nue"
IB 2170 IF PEEK(53279)<>5 THEN 2170
CK 2200 POSITION 0,0: ? #6;"(CLEAR) T
HE ROBOT ";CHR$(162);" GRAP
";CHR$(136);" AND SNAKE ";CH
R$(134);" CAN"
MD 2210 ? #6;"LAND ON A DINIT ";CHR$(
170);"(3 SPACES)BUT A GREML
IN ";CHR$(5);"(5 SPACES)BLOC
KHEAD ";CHR$(4);" OR"
JA 2220 ? #6;"NORF ";CHR$(35);" CANN
OT." : ? #6: ? #6;" number of t
urns 10 in which to score
(3 SPACES)per level 10"
PH 2230 ? #6;"-----": ? #6: ? #
6;" 10 10": ? #6: ? #6;"1 60
YOU MUST(5 SPACES)2 50 SCO
RE BEFORE"
EJ 2240 ? #6;"3 40 TURN 10": ? #6;"
4 30 REACHS 0."
FP 2250 ? #6;"5 20": ? #6;"6 10"
HN 2290 ? #6: ? #6: ? #6;"(4 SPACES)pr
ess select(8 SPACES)to conti
nue"
JB 2295 IF PEEK(53279)<>5 THEN 2295
BN 2300 POSITION 0,0: ? #6;"(CLEAR) G
RAPPS REMAIN PINK ";CHR$(136)
;"UNTIL THE GRAP COUNT(5) RE
ACHS 0."
KJ 2310 ? #6: ? #6;" YOU EARN 1 CHANC
E AT A SNAKE ";CHR$(134);"
EVERY 1000 PTS, AND AT A"
NA 2320 ? #6;"GRAP ";CHR$(136);" EVE
RY SNAKE ";CHR$(134)
KH 2330 ? #6;" YOU EARN 1 ROBOT ";CH
R$(162);" EVERY 2500 PTS." : ?
#6
NK 2340 ? #6;" PRESS THE TRIGGER TO
STOP OR CONTINUE A GAME."
MB 2400 GOTO 1010
OC 2500 REM DATA FOR ROBOT,NORF,BLOC
KHEAD,GREMLIN,SNAKE(R),SNAKE
(L),GRAP(162),GRAP(41),DINIT
IC 2510 DATA 24,36,24,126,90,90,24,6
0
IC 2520 DATA 126,153,255,195,90,126,
36,102
BH 2530 DATA 126,90,126,255,24,60,36
,102
LO 2540 DATA 24,36,24,60,126,60,66,1
95
NP 2550 DATA 0,0,12,190,245,67,0,0
BG 2560 DATA 0,0,48,121,175,194,0,0
PB 2570 DATA 66,126,90,60,231,129,19
5,0
PC 2580 DATA 66,126,90,60,231,129,19
5,0
GA 2590 DATA 65,93,42,28,42,73,20,54
FD 2599 REM DATA FOR GRAP MOVEMENT
DG 2600 DATA 600,620,580,600,620,600

```



# BREAKDANCE.<sup>TM</sup> BREAKIN' MADE EASY.



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*One or two players; joystick controlled.*



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Strategy Games for the Action-Game Player



[www.commodore.ca](http://www.commodore.ca)



```

, 620, 580, 560, 580, 600, 620, 560
, 620, 600, 580, 600, 620, 620, 600
, 620, 600, 99
MH 2700 IF STRIG(0)=0 THEN 2700
NC 2705 IF STRIG(0)=1 THEN 2705
JE 2710 IF STRIG(0)=0 THEN 140

```

## Program 2: Things In The Dark For 64

Version by Kevin Mykytyn, Editorial Programmer  
Refer to "COMPUTE!'s Guide To Typing In Programs"  
before entering this listing.

```

100 POKE52, 48:POKE56, 48:CLR:GOSUB540:GOSU
    B690:GOSUB980 :rem 77
110 GOSUB840:GOSUB920:POKE53281, 0:rem 203
120 IFNM=0THENPRINT "{HOME}{DOWN}"TAB(31)"
    {6 SPACES}":GOTO1040 :rem 86
130 PRINT "{HOME}{DOWN}"TAB(32)" {7 SPACES}
    " :rem 90
140 IFNM>1THENFORA=1TONM-1:PRINT "{HOME}
    {DOWN}{YEL}"TAB(32+A); "I"; :NEXT
    :rem 169
150 TU=55-5*LV:T1=TU:PRINT "{3 SPACES}"
    :rem 196
160 PRINT "{HOME}{4 DOWN}*****
    *****" :rem 79
170 T1=T1-U :rem 97
180 IFSC>=SSTHENSS=SS+1000:SF=1:POKESX, BL
    :SX=INT(RND(1)*10)*V+M1:GR=:POKEGX, B
    L :rem 10
190 PRINT "{HOME}{DOWN}{2 SPACES}GC:"GC"
    {LEFT} ":PRINT "{HOME}{3 DOWN}
    {2 SPACES}SCORE:"SC"{5 SPACES}L:"LV"
    {8 SPACES}T:"T1"{LEFT}{2 SPACES}"
    :rem 255
200 IFSFTHENGOSUB440 :rem 1
210 IFSC-LC=>5000ANDAD=UTHEMLC=LC+FV:LV=L
    V+1:IFLV>6THENLV=6 :rem 41
220 IFSC-BC>=2500THENBC=BC+2500:NM=N+1:G
    OTO140 :rem 38
230 IFGRTHENGOSUB500 :rem 1
240 IFPEEK(M4)=111THENGOSUB1120 :rem 95
250 WAITM4, M7, :JV=M5-(PEEK(M4)ANDM5)
    :rem 186
260 IFJVTHENPOKEX1, BL:X1=X1+JY(JV):POKEV1
    , 33:J2=JV :rem 197
270 IFT1=.THENPOKES+4, 32:GOSUB1000:GOTO10
    40 :rem 108
280 KX=X1:GOSUB1090:X1=KX :rem 42
290 PE=PEEK(X1):POKEV1, 32:ONPE-31GOTO370,
    370, 300, 310, 320, 330, 330, 340, 340, 370
    :rem 147
300 GOSUB1000:GOTO120 :rem 218
310 SC=SC+100:LS=LS+100:T1=TU:GOTO370
    :rem 220
320 SC=SC+100:LS=LS+100:T1=TU:GOTO370
    :rem 125
330 SC=SC+200:LS=LS+200:T1=TU:GR=U:SF=0:G
    C=50-2*LV:CG=3:GX=M1+M3*RND(U):GOTO37
    0 :rem 61
340 CG=PEEK(X1+C)AND15 :rem 4
350 IFCG=3THENS=SC+400:LS=LS+400:T1=TU:G
    R=:POKEGX, BL:GOTO370 :rem 158
360 GOSUB1000:GOTO120 :rem 224
370 POKEX1, RO:POKEX1+C, U :rem 0
380 IFRND(U)<FTHENFORT=1TO20:NEXT:GOTO170
    :rem 151
390 W=RND(U)*M3+M1:PW=PEEK(W):V=INT(RND(U)
    )*4+1:PV=ME(V, U):PC=ME(V, TW) :rem 54
400 IFPW<>BLANDPV<>DITHEML70 :rem 25
410 IFPV=DITHEMLW=PD-U:PD=W :rem 207
420 IFPV=DIANDPEEK(W)<>BLTHENW=RND(U)*M3+

```

```

M1:PD=W :rem 63
430 POKEW, PV:POKEW+C, PC:GOTO170 :rem 231
440 KX=SX:KX=KX+1:J=PEEK(KX) :rem 22
450 IFJ<>BLANDJ<>DITHEMLKX=KX+39:GOSUB1090
    :J=PEEK(KX):IFJ<>BLANDJ<>DITHEML470
    :rem 78
460 POKESX, BL:SX=KX:GOTO490 :rem 3
470 KX=KX-80:GOSUB1090:J=PEEK(KX):IFJ<>BL
    ANDJ<>DITHEML490 :rem 28
480 GOTO460 :rem 111
490 POKESX, SN:POKESX+C, 8:RETURN :rem 68
500 KX=GX:KX=KX+JY(RND(1)*5):GOSUB1090:IF
    PEEK(KX)=BLTHENPOKEGX, BL:GX=KX:rem 86
510 POKEGX, 39:POKEGX+C, CG:GC=GC-1 :rem 17
520 IFGC<=.THENG=.:GR=0:POKEGX+C, 4
    :rem 145
530 RETURN :rem 120
540 TH$="{Y}O- .{DOWN}{4 LEFT}{G}{Q}I-{Q}
    IUIUI{DOWN}{10 LEFT}{G}-----JI
    {DOWN}{10 LEFT}{G}-----J{W}JK":rem 71
550 TH$=TH$+"{DOWN}{4 LEFT}JK":D$="{RVS}
    {SPACE}{OFF}{RVS}{OFF}{RVS}{OFF}
    {SPACE}{RVS}{OFF}{RVS}{OFF}{RVS}
    {SPACE}{OFF}{RVS}{OFF}{RVS}":C$="
    {DOWN}{15 LEFT}" :rem 247
560 A$="{RVS}{2 SPACES}{*}{OFF}{RVS}f
    {*}{OFF}{RVS}{2 SPACES}{*}{OFF}
    {RVS}{OFF}{RVS}"+C$+D$+C$+D$
    :rem 179
570 A$=A$+C$+"{RVS}{OFF}{RVS}{OFF}
    {RVS}{3 SPACES}{OFF}{RVS}{2 SPACES}
    {OFF}f {RVS}{2 SPACES}{OFF}f"+C$+D$
    +C$+"{RVS}{2 SPACES}{OFF}f {RVS}
    {OFF}{RVS}{OFF}{RVS}{OFF}{RVS}
    {OFF}{RVS}{OFF}" :rem 209
580 A$=A$+"{RVS}":POKE53281, 0 :rem 237
590 PRINT "{CLR}{2 DOWN}{WHT}{7 RIGHT}"TH
    $"{3 DOWN}IN{2 DOWN}{3 LEFT}THE
    {4 DOWN}{5 LEFT}"A$C$"{2 DOWN}
    {2 RIGHT}{RVS}PLEASE WAIT"; :rem 153
600 POKE56334, PEEK(56334)AND254:POKE1, PEE
    K(1)AND251 :rem 183
610 FORI=0TO511:POKEI+12288, PEEK(I+53248)
    :NEXT:POKE1, PEEK(1)OR4 :rem 39
620 POKE56334, PEEK(56334)OR1:PRINT "{CLR}"
    :POKE53272, (PEEK(53272)AND240)OR12
    :rem 178
630 FORI=12552TO12631:READA:POKEI, A:NEXT:
    RETURN :rem 238
640 DATA24, 36, 24, 126, 90, 90, 24, 60, 126, 153,
    255, 195, 90, 126, 36, 102 :rem 31
650 DATA126, 90, 126, 255, 24, 60, 36, 102, 24, 36
    , 24, 60, 126, 60, 66, 195 :rem 237
660 DATA0, 0, 12, 190, 245, 67, 0, 0, 0, 48, 121,
    175, 194, 0, 0, 66, 126, 90, 60, 231, 129, 195,
    0 :rem 63
670 DATA66, 126, 90, 60, 231, 129, 195, 0, 65, 93,
    42, 28, 42, 73, 20, 54 :rem 98
680 DATA 0, 0, 0, 0, 255, 0, 0, 0 :rem 216
690 POKE53281, 0:PRINT "{CLR}{DOWN}{WHT} LA
    ND THE ROBOT.. ! ON GREMLINS.. {BLU}$
    {WHT} 10" :rem 231
700 PRINT "PTS: BLOCKHEADS.. {GRN}#{WHT}
    {SPACE}100 PTS: SNAKES.. " :rem 238
710 PRINT "{YEL}{WHT} 200 PTS: CYAN GRAP
    S...{CYN}{WHT} 400 PTS." :rem 170
720 PRINT "{DOWN} AVOID THE NORFS.. {RED}"
    ;CHR$(34);:POKE646, 1:PRINT". BOTH THE
    " :rem 171
730 PRINT "ROBOT AND THE NORF DISAPPEAR W
    HEN THEY" :rem 223

```



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# Program 3: Things In The Dark, VIC Loader

Version by Kevin Mykytyn, Editorial Programmer  
Refer to "COMPUTE!'s Guide To Typing In Programs"  
before entering this listing.

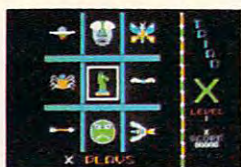
```

740 PRINT" TOUCH. TOUCHING A PURPLE GRAP
    {SPACE}IS LIKE{3 SPACES}TOUCHING A NO
    RF." :rem 135
750 PRINT"{DOWN} THE ROBOT, GRAP AND SNAK
    E CAN LAND ON A"; :rem 138
760 PRINT" DINIT "CHR$(41)" BUT A GREMLIN
    , BLOCKHEAD OR{5 SPACES}NORF CANNOT." :rem 139
770 PRINT"{DOWN} YOU MUST SCORE BEFORE TH
    E TURN COUNTER" :rem 63
780 PRINT" T: REACHES 0. THE GRAPS REMAIN
    CYAN" :rem 156
790 PRINT" UNTIL THE GRAP COUNTER GC: REA
    CHES 0. :rem 35
800 PRINT"{DOWN} YOU EARN ONE CHANCE AT A
    SNAKE EVERY" :rem 244
810 PRINT" 1000 POINTS AND AT A GRAP EVER
    Y SNAKE." :rem 6
820 PRINT"{DOWN} PRESS FIREBUTTON TO FREE
    ZE ACTION." :rem 91
830 PRINT"{DOWN}{5 SPACES}PRESS ANY KEY T
    O CONTINUE";WAIT198,1:RETURN:rem 166
840 PRINT"{CLR}{4 DOWN}{5 SPACES}ADVANCE
    {SPACE}OR NO ADVANCE A/N "; :rem 95
850 GETA$:IFA$<>"A"ANDAS$<>"N"THEN850 :rem 31
860 PRINT AS$ :rem 144
870 IFA$="A"THENAD=1 :rem 119
880 IFA$="N"THENAD=0 :rem 132
890 PRINT"{3 DOWN}{4 SPACES}LEVEL 1-6 , 1
    IS THE EASIEST "; :rem 212
900 GETA$:IFA$<"1"ORA$>"6"THEN900 :rem 67
910 PRINT AS$:LV=VAL(AS$):PRINT"{CLR}" :rem 220
920 NM=2:GC$="":JY(1)=-40:JY(2)=40:JY(4)=
    -1:JY(8)=1:X1=1524:JY(3)=0:V=40 :rem 216
930 JY(5)=-41:JY(6)=39:JY(7)=0:JY(9)=-39:
    JY(10)=41 :rem 225
940 C=54272:M1=1224:M2=2023:M3=800:M4=563
    20:M5=15:SN=37:U=1:F=.7:TW=2 :rem 119
950 S=54272:FORK=STOS+24:POKEK,0:NEXT:POK
    ES+24,15:DX=1:LC=0:BC=0:FV=5000 :rem 155
960 BL=32:M7=16:RO=33:DI=41:V1=54276:POKE
    54273,10:POKE54277,0:POKE54278,240 :rem 28
970 PD=1400:SX=2025:LS=0:SC=0:GC=0:GR=0:S
    F=0:SS=1000:RETURN :rem 77
980 FORA=1TO4:FORB=1TO2:README(A,B):NEXTB
    ,A:RETURN :rem 222
990 DATA 34,2,35,5,36,6,41,1 :rem 91
1000 NM=NM-1 :rem 146
1010 POKES+18,33:POKES+19,17:POKES+20,240 :rem 90
1020 FORZ1=1TO3:FORZ2=20TO0STEP-1:POKES+1
    8,33:POKES+15,Z2:POKES+18,32:rem 250
1030 NEXTZ2,Z1:POKEX1,BL:X1=1524:POKEX1,B
    L:RETURN :rem 132
1040 POKES+24,0:PRINT"{HOME}{DOWN}
    {16 RIGHT}GAME OVER" :rem 137
1050 PRINT"{15 RIGHT}PLAY AGAIN?" :rem 31
1060 GETA$:IFA$<>"Y"ANDAS$<>"N"THEN1060 :rem 139
1070 IFA$="Y"THEN110 :rem 87
1080 POKE828,0:SYS828 :rem 209
1090 IFKX<M1THENKX=KX+M3 :rem 19
1100 IFKX>M2THENKX=KX-M3 :rem 16
1110 RETURN :rem 163
1120 WAITM4,M7,0:WAITM4,M7,M7:RETURN :rem 240

100 POKE52,28:POKE51,0:POKE56,28:POKE55,0
    :CLR :rem 156
110 TH$="{Y}O- .{DOWN}{4 LEFT}{G}{Q}{I}-{Q}
    IUIUI{DOWN}{10 LEFT}{G}-----JI
    {DOWN}{10 LEFT}{G}-----J{W}{JK}":rem 64
120 TH$=TH$+"{DOWN}{4 LEFT}{JK}":DS="{RVS}
    {SPACE}{OFF}{RVS}{OFF}{RVS}{OFF}
    {SPACE}{RVS}{OFF}{RVS}{OFF}{RVS}
    {SPACE}{OFF}{RVS}{OFF}{RVS}":CS="
    {DOWN}{15 LEFT}" :rem 240
130 AS$="{RVS}{2 SPACES}{*}{OFF}{RVS}
    {*}{OFF}{RVS}{2 SPACES}{*}{OFF}
    {RVS}{OFF}{RVS}"+CS+DS+CS+DS :rem 172
140 AS$=AS$+CS$+"{RVS}{OFF}{RVS}{OFF}
    {RVS}{3 SPACES}{OFF}{RVS}{2 SPACES}
    {OFF}£ {RVS}{2 SPACES}{OFF}£"+CS$+DS
    +CS$+"{RVS}{2 SPACES}{OFF}£ {RVS}
    {OFF}{RVS}{OFF}{RVS}{OFF}{RVS}
    {OFF}{RVS}{OFF}" :rem 202
150 AS$=AS$+"{RVS}":POKE36879,8 :rem 252
160 PRINT "{CLR}{DOWN}{WHT}"TH$"{3 DOWN}I
    N{2 DOWN}{3 LEFT}THE{4 DOWN}{5 LEFT}"
    AS$C$"{2 DOWN}{2 RIGHT}{RVS}PLEASE WAI
    T"; :rem 182
170 FORI=0TO511:POKEI+7168,PEEK(I+32768):
    NEXT :rem 187
180 PRINT"{CLR}":POKE36869,255 :rem 62
190 FORI=7432TO7511:READA:POKEI,A:NEXT :rem 119
200 DATA24,36,24,126,90,90,24,60,126,153,
    255,195,90,126,36,102 :rem 23
210 DATA126,90,126,255,24,60,36,102,24,36
    ,24,60,126,60,66,195 :rem 229
220 DATA0,0,12,190,245,67,0,0,0,48,121,
    175,194,0,0,66,126,90,60,231,129,195,
    0 :rem 55
230 DATA66,126,90,60,231,129,195,0,65,93,
    42,28,42,73,20,54 :rem 90
240 DATA 0,0,0,0,255,0,0,0 :rem 208
250 PRINT"{CLR}{DOWN}{WHT} LAND THE ROBOT
    .. ! ONGREMLINS.. {BLU}$ {WHT} 10"; :rem 82
260 PRINT" PTS:{2 SPACES}BLOCKHEADS..
    {GRN}#{WHT} 100 PTS: SNAKES.."; :rem 42
270 PRINT" {YEL}%{WHT} 200 PTS: CYAN GRAP
    S..{CYN}'{WHT} 400 PTS."; :rem 184
280 PRINT"{DOWN} AVOID THE NORFS.. {RED}"
    ;CHR$(34);:POKE646,1:PRINT". BOTH THE
    ROBOT"; :rem 109
290 PRINT" AND THENORF DISAPPEAR WHEN" :rem 32
300 PRINT"THEY TOUCH. TOUCHING{2 SPACES}A
    PURPLE GRAP IS LIKE TOUCHING A NORF.
    " :rem 185
310 PRINT"{DOWN} THE ROBOT, GRAP AND
    {2 SPACES}SNAKE CAN LAND ON A":rem 71
320 PRINT"DINIT..) BUT A GREMLIN,BLOCKHEA
    D OR NORF{4 SPACES}CANNOT." :rem 13
330 PRINT"{2 DOWN}{5 SPACES}HIT ANY KEY":
    WAIT198,1 :rem 173
340 PRINT"{6 DOWN} YOU MUST SCORE BEFORET
    HE TURN COUNTER T:" :rem 27
350 PRINT"REACHES 0. THE GRAPS{2 SPACES}R
    EMAIN CYAN UNTIL THE" :rem 116

```





## TRIAD

by Ed Hobbs

Color Computer Version by Jeff Francis

The imaginative game scenario centers around a master tic-tac-toe board. Score an "X" by selecting and successfully battling one of nine weird foes. Three X's in a row and Bingo! — you automatically advance to the next level! But the core of TRIAD is the colorful hi-resolution graphics and great sounds. They simply have to be experienced firsthand!

TRIAD excels in the "frills department," too — keyboard or joystick option, game freeze, running high score and more. And a succession of teeth-gritting skill levels is guaranteed to test the eye-to-hand coordination of the most valiant of armchair warriors. Joystick required on Commodore version.

APPLE 2 DOS 3.3 Required Flippy Disk 48K

ATARI 400/800

102-0173 \$34.95 (£25.49 inc. VAT)

Color Computer 16K Tape

060-0173 \$34.95 (£25.47 inc. VAT)

Commodore 64 version distributed by Commodore



## AREX

by William Muk

Commodore 64 Versions by Phil Case

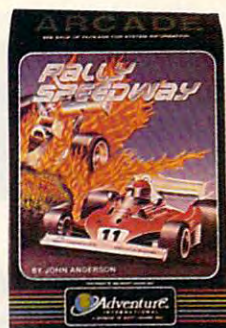
Atari Version by John Anderson

Color Computer Version by Roger Schrag

AREX — Enter and neutralize at least 90% of the enemy's territory while avoiding 3 distinct types of alien ships. A successful invasion earns advancement to subsequent (and, of course, more difficult) levels of play.

AREX features phenomenal graphics routines, high score retention, one- or two-player option and multiple skill levels.

ATARI 16K TAPE	050-0172	\$34.95	(£25.49 inc. VAT)
ATARI 16K DISK	052-0172	\$34.95	(£25.49 inc. VAT)
COMMODORE 64 TAPE	090-0172	\$34.95	(£25.49 inc. VAT)
COMMODORE 64 DISK	092-0172	\$34.95	(£25.49 inc. VAT)
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TRS-80 16K TAPE Model 1 & 3	010-0172	\$34.95	(£25.49 inc. VAT)
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ATARI

Winner of  
1984 CES  
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## RALLY SPEEDWAY

by John Anderson

A colorful, scrolling roadscape serves as an exciting backdrop for fun-injected action — choose one of several different courses provided or "construct" your own. Players are challenged to hot rod their joystick-controlled cars down grueling straightaways, around hairpin corners and past an ever-changing landscape that includes houses, lakes, orchards and more. Work on improving your lap time with a solo game, or invite a friend along for a one-on-one duel to the finish line — there's plenty of excitement to go around! Joystick required.

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053-0171 \$49.95 (£35.99 inc. VAT)

Commodore 64 version distributed by Commodore



Nominated for 1985  
Electronics Games  
Magazine, Game  
of the Year.

## C'EST LA VIE

by Gordon Eastman

It's a dream come true! The streets are littered with \$10, \$20 and \$50 bills, and you're challenged to collect as many bucks as you can. But there are flies in this financial ointment — thieves and tax men abound. A loan from your friendly neighborhood loan shark may tide you over, but you'd better repay him on time or else!

Great graphics and sounds. For one or two players. Joystick optional.

APPLE 2 48K DISK DOS 3.3	042-0218	\$34.95	(£25.49 inc. VAT)
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Commodore Plus/4 distributed by Commodore

APPLE  
ATARI  
COM. 64



# NEW



## WHOMPER STOMPER

by Mario Inchiosa and Mike Wall

The weekend sun beamed warmly over Bill Bunion and his long awaited picnic lunch. "Nothing can go wrong on a day like today," he thought lazily. Wrong! Just as Bill finally began to unwind . . . ants! A wave of the dreaded pests on his food. Wildly stomping, Bill attempted to annihilate his small enemies, helped by Artie, his ever ravenous aardvark.

But other dangers lurked. Birds, obviously in league with the ants, bombarded him with their lethal weapons. Can he dodge them while saving his picnic basket from the ants?

Features multiple skill levels. Joystick required. (Whomper Stomper on C64 soon to be released).

ATARI DISK 48K	52-0230	\$29.95
APPLE DISK 48K	42-0230	\$29.95



## MAXI<sup>®</sup> GOLF

Endorsed by the world's golf "fun" pro's Chi Chi Rodriguez & Fuzzy Zoeller.

by John Horan

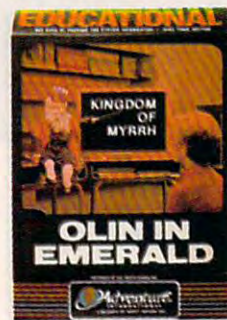
So what if it's raining! MAXI GOLF, an incredibly realistic golf simulation for 1 to 4 players, will have you on the greens faster than you can say "FORE." This beautiful high resolution golf course is always perfect for teeing off, no matter what the weather or time of day.

There are many features that will help you practice your swing or to make that birdie. You can alter your stance, choose any variation of club, change the swing speed and add a hook or slice to the ball. The two golf courses provided come complete with those dreaded water hazards, sand traps and roughs.

After becoming the pro of your neighborhood, have your own challenging tournament. Just to make it interesting, utilize the most unique feature of the game - the Course Designer - to create the golf course of your dreams.

MAXI GOLF is a fine blend of strategy, judgement, and playing skill, and is highly recommended for all players.

APPLE 2 DISK	42-0228	\$29.95
ATARI 48K DISK	52-0228	\$29.95
COMMODORE 64 DISK	192-0228	\$29.95



## OLIN IN EMERALD

by Gordon Morrell, PhD, and George Taylor, M.S.  
Graphics by Sheila Morrell, "Graphics created with Penguin Software's Graphics Magician"

Imagine going on a treasure hunt past a sea of chocolate syrup and sharing your peanut butter and jelly sandwich with a hungry critter! You can do all this as well as help good King Olin escape from the clutches of the evil sorcerer Vargor.

As you travel on this graphic adventure through the Kingdom of Myrrh, you must write down all the clues you find. It will be helpful for you to draw a map of Myrrh so you don't get lost, and you'll get lots of practice using your decision making skills as you and Anara, your companion on the journey through Myrrh, try to find King Olin.

Note to Parents: Author Gordon Morrell, PhD, in Education from the University of California, has had several years of teaching experience and has published COMPUTER-EASE, a book on selecting a personal computer. George Taylor has a B.A. in Mathematics from the University of California, and earned his M.S. from the University of Utah.

APPLE 2 DISK	42-0229	\$29.95
ATARI 48K DISK	52-0229	\$29.95



## KINGDOM OF FACTS

by Gordon Morrell, PhD, and George Taylor, M.S.  
Graphics by Sheila Morrell, "Graphics created with Penguin Software's Graphics Magician"

Engage in a "battle of wits" in the exciting KINGDOM OF FACTS! Choose your own skill level, and compete against your friends in four categories: Words (spelling and vocabulary), Social Science (history and geography), Math and Science, and Trivia, all selected from current elementary school textbooks.

You can even enter your own sets of questions with the Text Editor section. This feature ensures that parents, children and teachers will be able to use this program to enhance learning for a long, long, time.

This second of a series featuring the Kingdom of Myrrh characters will delight players of all ages, and even more important, will make learning fun. And when you get down to it, that's what counts!

C64 DISK	192-0232	\$29.95
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# NEW



## THE HULK™

by Scott Adams

Listen up, True Believer! The world's premier comics company has joined with the originator of Adventure games to bring you the awesome QUESTPROBE™ series: an epic group of home computer Adventures by Marvel Comics and Scott Adams in which you become the greatest Marvel Superheroes™.

In this first QUESTPROBE™, you become Bruce Banner (and the HULK™). You will encounter such dastardly villains as Ultron and Nightmare, and some good guys such as Ant Man and Doctor Strange. You'll find yourself in some pretty strange places, and you'll have to rely on the Hulk's strength to make it through. You might even be lucky enough to solve the riddle of the Chief Examiner™. Some versions with graphics.

All QUESTPROBE™ disk versions (except TRS 80) are available through Commodore & sold retail by Adventure.

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IBM DISK	132-0225	\$29.95*
APPLE DISK	042-0225	\$29.95*
C64 DISK	192-0225	\$29.95*

\*Available retail only. Note prices subject to change without notice.



## SPIDER-MAN™

by Scott Adams

Here's the second installment of the QUESTPROBE™ series, and True Believers, you're in for a treat. It's not business as usual at the Daily Bugle, or with our hero, Spider-Man™. Instead of cuddling with a cutie, he's battling it out with Lizard™, Hydroman™, and Mysterio™.

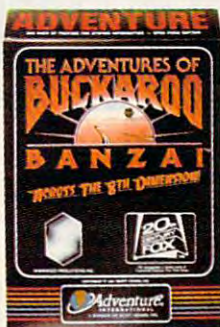
Once again you have the opportunity to command the powers of a Marvel Superhero™ as Spider-Man™ is faced with new and exciting challenges. Even the help of Madame Web™ might not be enough to get you through this one.

Become Spider-Man, and climb walls, sling webs, and perhaps solve the riddle of the Chief Examiner.

Graphics on some versions . . . Disk versions available through Commodore.

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COMMODORE C64 TAPE	190-0226	\$29.95
TRS CoCo 16K TAPE	60-0226	\$29.95
TRS 80 Mod 1 & 3 & 4 48K DISK	12-0226	\$29.95

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## BUCKAROO BANZAI™

by Scott Adams and Phil Case

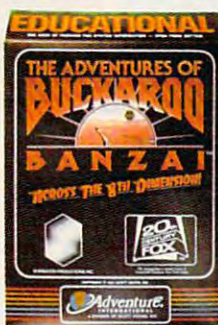
You saw the hit movie, now play the adventure! Join the members of the Banzai Institute as they solve the mysteries of the universe with Buckaroo Banzai™.

Not just another pretty face, Buckaroo is a neurosurgeon and particle physicist who drives a super-sonic jet powered automobile, and displays his musical talent with a rock group called the Hong Kong Cavaliers.

In this adventure, you, as Buckaroo, must disarm the doomsday bomb that has been left on Earth by the evil Lectroids.

This bomb will destroy the world unless Buckaroo can transmit the radio code necessary for disarmament. What will Buckaroo do now that the bomb has entered the final countdown stages? The bomb will go off today - so Buckaroo must act quickly!

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ATARI 48K TAPE	50-0227	\$29.95
COMMODORE 64 DISK	192-0227	\$29.95
TRS 80 MODELS 1 & 3 & 4 DISK	12-0227	\$29.95



## BUCKAROO BANZAI™ EDUCATIONAL

by Roderick Smith and Rhonda Lore, MA

Buckaroo Banzai™, the hard-driving neurosurgeon and particle physicist, needs help finding the overthruster which will enable him to save the world. Can you beat the computer and earn the right to help?

In this program, there are three increasingly complex challenges to be met and conquered before you can join the search for the overthruster. Number sequencing, sentence completion and word completion tasks must be faced and solved in order to earn time units. The more time units you have, the more time you have to search.

As Buckaroo says, "The only reason for time is so that everything does not happen at once."

A stimulating educational tool which will provide hours of enjoyment and learning - ideal for ages 7 through 12.

C64 DISK	192-0231	\$29.95
ATARI 48K DISK	52-0231	\$29.95

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# ADVENTURE



## THE ADVENTURE SERIES: AN OVERVIEW

By definition, an adventure is a dangerous or risky undertaking. On your personal computer, Adventure is that and more!

Playing any of the Adventures includes three elements: you, the user; the games themselves; and the author, Scott Adams of Orlando, Florida.

In beginning any Adventure, you will find yourself in a specific location: in a forest, maybe on board a small spaceship, or perhaps in a desert. The top portion of your video display will tell you where you are and what you see; the bottom section of the display is devoted to inputting commands to your robot computer and receiving messages that may arise as the result of your orders.

By using two-word commands you move from location to location (they're called "rooms", though some rooms represent outdoor sites like a swamp), manipulate objects that you find in different rooms (pick them up, put them down, carry them, etc.) and perform actions as if you were really there.

The object of the game is to amass treasure for points or accomplish a specified task. Successfully completing a game, however, is far easier to discuss than to achieve. In many cases you will find a treasure but be unable to take it until you are carrying the right combination of objects that you'll find in various locations.

If you're tired of video games with bouncing balls, or bored with shooting at targets, and you're ready for an intellectual challenge that transports you to new worlds of experience; if you want to see what a skilled programmer can do with a micro, then invest in one of Scott Adams' games. An early Adventure (Adventureland or Pirate Adventure) is a good place to start, because the more Adams creates, the tougher his puzzles get.

by Ken Mazur

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## THE GRAPHIC ADVENTURES

As the name implies, the Scott Adams Graphic Adventures are Scott's classic text Adventures enhanced with exciting hi-res graphics — graphics which colorfully depict your voyage into wonderment each and every step of the way. Each Adventure challenges the player to accumulate points, crack a mystery or accomplish a goal using the unique tools of Adventuring: two-word commands, some common sense and a little ingenuity.

If you've never played an Adventure, here's the place to begin. If you're an experienced Adventurer, prepare for a magical encounter unlike any other. Remember: Anything can happen when you play a Scott Adams Graphic Adventure ... and it usually does!

See individual descriptions on opposite page.



Adv. No.	S.A.G.A. Apple II 48K Disk	S.A.G.A. Atari Disk	Atari 400/800 48K Tape 400/800	Commodore Plus/4 & C64 Disk	C64 Tape	**Texas Instruments Requires Command Module	Standard Color Comp. 16K Tape	IBM	Adventure No.	Standard Atari TRS80 400-800 Model I & III 32K Disk	Northstar CP/M Horizon & Adv. 5 1/4 Disk
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## HINT BOOK

Our hint book provides clues and solutions to help you out of those sticky spots you have gotten into, while still enabling you to solve the Adventure yourself. So if you can't seem to get out of the bog, or locate the Pharaoh's heart, then you've come to the right place for help. This edition includes hints for all SCOTT ADAMS Adventures 1 - 14, PLUS SPIDER-MAN™, HULK™, and BUCKAROO BANZAI™. There is also a special section on the making of Adventure Maps. For those that just want answers, there is a solution section, too. But don't worry. All clues and solutions are specially encoded so that the only time you can get a clue or answer is when you want one.

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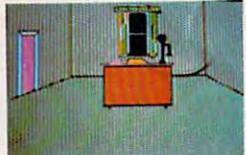
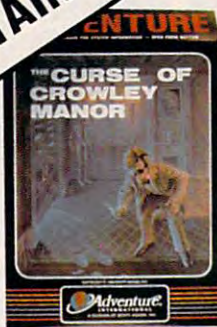


## THE ADVENTURES

- #1 ADVENTURELAND** — Wander through an enchanted realm and try to uncover the 13 lost treasures. There are wild animals and magical beings to reckon with as well as many other perils and mysteries. This is the Adams Classic that started it all! Difficulty Level: Moderate
- #2 PIRATE ADVENTURE** — Only by exploring this strange island will you be able to uncover the clues necessary to lead you to your elusive goal — recovering the lost treasures of Long John Silver. Difficulty Level: Beginner
- #3 ADVENTURE #3** — In this exciting Adventure, time is of the essence as you race the clock to complete your mission in time or else the world's first automated nuclear reactor is doomed! If you survive this challenging mission, consider yourself a true Adventurer! Difficulty Level: Advanced
- #4 VOODOO CASTLE** — The Count has fallen victim to a fiendish curse placed on him by his enemies. There he lies, with you his only possible hope. Will you pull off a rescue, or is he really down for the Count?! Difficulty Level: Moderate
- #5 THE COUNT** — It begins when you awake in a large brass bed in a castle somewhere in Transylvania. Who are you, what are you doing here and WHY did the postman deliver a bottle of blood? Difficulty Level: Moderate
- #6 STRANGE ODYSSEY** — At the galaxy's rim, there are rewards aplenty to be harvested from a long-dead alien civilization, including fabulous treasures and advanced technologies far beyond human ken! Prepare yourself for the incredible! Difficulty Level: Moderate
- #7 THE MYSTERY FUN HOUSE** — As Adventure #7 begins, you find yourself hopelessly lost in the middle of a carnival fun house. While escape may elude you, one thing is very clear — you're NOT here to have a good time! Difficulty Level: Moderate

- #8 PYRAMID OF DOOM** — This is an Adventure that will transport you to a dangerous land of crumbling ruins and trackless desert wastes into the PYRAMID OF DOOM! Jewels, gold — it's all here for the plundering — IF you can find the way. Difficulty Level: Moderate
- #9 GHOST TOWN** — You must explore a once-thriving mining town in search of the 13 hidden treasures. With everything from rattlesnakes to runaway horses, it sure ain't going to be easy! Includes a special bonus scoring system too! Difficulty Level: Advanced
- #10 SAVAGE ISLAND PART I** — A small island holds an awesome secret — will you be able to discover it? This is the beginning of a two-part Adventure. (The story continues in SAVAGE ISLAND PART II, ADVENTURE #11.) NOTE: This one's a toughie — for experienced Adventurers only! Difficulty Level: Advanced
- #11 SAVAGE ISLAND PART II** — The suspense begun in Adventure #10 now comes to an incredible conclusion with SAVAGE ISLAND PART II! This Adventure requires you to have successfully finished #10, wherein you were given the secret password to begin this final half. NOTE: For experienced Adventurers only! Difficulty Level: Advanced
- #12 GOLDEN VOYAGE** — The king lies near death in the royal palace. You have only three days to bring back the elixir needed to rejuvenate him. Journey through the lands of magic fountains, sacred temples, stormy seas and gold, gold, GOLD! This one is for experienced Adventurers only! Difficulty Level: Advanced
- #13 SCORCERER OF CLAYMORGUE CASTLE** — Long ago, in times past beyond remembrance, Solon, the Master Wizard and wearer of the Secret Cloak, lost the 13 Stars of Power. Find the Stars within Claymorgue Castle, but beware! The castle harbors further spells, and one unskilled in the magical arts cannot predict their outcome. Difficulty level - Advanced.





Jyym Pearson  
Graphics by  
Norman Sailer

APPLE  
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## THE CURSE OF CROWLEY MANOR

London 1913. You are Inspector Black of Scotland Yard, and though you *think* you've seen everything in the line of duty — **nothing** you've ever experienced has prepared you to solve the horrifying mystery of the Curse of Crowley Manor. Skill Level: Moderate-Advanced

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COLOR COMPUTER 16K TAPE	140-0108
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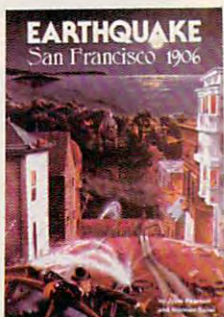
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## ESCAPE FROM TRAAM

While on a routine patrol assignment, your small spacecraft's engines fail, forcing you to land on the most hostile planet in the galaxies. No one yet has lived to tell the story of Escape From Traam. You can only hope to be the first. Skill Level: Moderate-Advanced

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Jyym Pearson  
Graphics by  
Norman Sailer

APPLE  
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## EARTHQUAKE: SAN FRANCISCO 1906

As buildings crumble and the earth opens to swallow what remains, you stumble through the ruins of what was once beautiful San Francisco. Panic-stricken survivors flee around you, but you fear for more than your own life. When the quake hit, you were on your way to Oakland with the ransom for your kidnapped wife. Time is running out ... which way do you go? Skill Level: Moderate-Advanced

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\*Apple with full color hi-res pictures!



Atari Version

Jyym Pearson  
Coauthored by  
Robyn Pearson  
Graphics by  
Norman Sailer

ATARI  
CoCo  
TRS-80

## SAIGON: THE FINAL DAYS

Vietnam, 5/75. Crashing through the dense jungle foliage, you hear the distant fire of the NVA camp guards. You've escaped, but you have a long way to go before you reach Saigon — if you ever do. Uncle Sam is pulling out, and Saigon holds your only hope of ever going home. Gritty realism and historic fact blend to form a unique adventuring experience that plunges you into a controversial chapter of recent history.

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```

360 PRINT"GRAP COUNTER GC:{6 SPACES}REACH
    ES 0.                                :rem 175
370 PRINT"[DOWN] YOU EARN ONE CHANCE
    {2 SPACES}AT A SNAKE EVERY 1000"
                                :rem 183
380 PRINT"POINTS AND AT A GRAP{2 SPACES}E
    VERY SNAKE. PRESS"                :rem 212
390 PRINT"THE FIREBUTTON AT ANY TIME TO F
    REEZE THE{4 SPACES}ACTION{BLK}"
                                :rem 143
400 S$="LO"+CHR$(34)+"V5"+CHR$(34)+"8:"
    +CHR$(131)                        :rem 136
410 FOR I=1 TO LEN(S$):POKE630+I,ASC(MID$(S$
    ,I)):NEXT I:POKE198,I:END         :rem 140

```

## Program 4: Things In The Dark, VIC Main Program

Refer to "COMPUTE!'s Guide To Typing In Programs" before entering this listing.

```

100 POKE36879,8:POKE36869,255         :rem 118
110 GOSUB700                            :rem 169
120 GOSUB550:GOSUB640                  :rem 1
130 IFNM=0 THEN PRINT"[HOME]{DOWN}"TAB(15)
    "{6 SPACES}":GOTO750                :rem 48
140 PRINT"[HOME]{DOWN}"TAB(15)"{6 SPACES}
    "                                    :rem 92
150 IFNM>1 THEN FOR A=1 TO NM-1:PRINT"[HOME]
    {DOWN}{YEL}"TAB(15+A);"!";NEXT A   :rem 171
160 TU=55-5*LV:T1=TU                   :rem 186
170 PRINT"[HOME]{DOWN}GC:":PRINT"[HOME]
    {3 DOWN}SC:{8 SPACES}L:{3 SPACES}T:"
                                :rem 134
180 PRINT"[HOME]{4 DOWN}*****"
    *****                            :rem 93
190 T1=T1-U                             :rem 99
200 IFSC=>SZ THEN SZ=SZ+1000:SF=1:POKESX,BL
    :SX=INT(RND(1)*10)*22+M1:GR=.:POKEGX,
    BL                                  :rem 38
210 PRINT"[HOME]{DOWN}{3 RIGHT}"GC"{LEFT}
    ":PRINT"[HOME]{3 DOWN}{3 RIGHT}"SC:P
    RINT"[HOME]{3 DOWN}"SPC(13);LV:rem 81
220 PRINT"[HOME]{3 DOWN}"SPC(18);T1"
    {LEFT} "                            :rem 236
230 IFSF THEN GOSUB460                  :rem 6
240 IFSC-LC=>5000 AND AD=UTHE NL=LC+V:LV=L
    V+1:IFLV>6 THEN LV=6                :rem 44
250 IFSC-BC=>2500 THEN BC=BC+2500:NM=NM+1:G
    OTO150                               :rem 42
260 IFGR THEN GOSUB510                  :rem 5
270 IF(PEEK(M4)AND32)=0 THEN GOSUB830
                                :rem 95
280 POKEDD,127:JV=(PEEK(M4)AND28)/4+(PEEK
    (JS)AND128)/16:POKEDD,255          :rem 98
290 JV=15-(JVAND15):IFJV THEN POKEX1,BL:X1=
    X1+JV(JV):POKEV1,33:J2=JV          :rem 156
300 IFT1=. THEN GOSUB720:GOTO750       :rem 163
310 KX=X1:GOSUB800:X1=KX               :rem 242
320 PE=PEEK(X1):ONPE-31 GOTO390,390,330,34
    0,350,360,360,370,370,390          :rem 39
330 GOSUB720:GOTO130                   :rem 182
340 SC=SC+100:LS=LS+100:T1=TU:GOTO390
                                :rem 225
350 SC=SC+10:LS=LS+10:T1=TU:GOTO390
                                :rem 130
360 SC=SC+200:LS=LS+200:T1=TU:GR=U:SF=0:G
    C=50-2*LV:GX=M1+M3*RND(U):GOTO390
                                :rem 14
370 CG=PEEK(X1+C)AND15:IFCG=3 THEN SC=SC+40
    0:LS=LS+400:T1=TU:GR=.:POKEGX,BL:GOTO
    390                                  :rem 73

```



A screen crowded with strange creatures in "Things In The Dark," VIC-20 version.

```

380 GOSUB720:GOTO130                  :rem 187
390 POKEX1,RO:POKEX1+C,U              :rem 2
400 IFRND(U)<F THEN190                 :rem 248
410 W=RND(U)*M3+M1:PW=PEEK(W):V=INT(RND(U)
    )*4)+1:PV=ME%(V,U):PC=ME%(V,TW)
                                :rem 121
420 IFPW<>BLANDPV<>DITHE N190         :rem 29
430 IFPV=DITHE NW=PD-U:PD=W           :rem 209
440 IFPV=DIANDPEEK(W)<>BL THEN NW=RND(U)*M3+
    M1:PD=W:GOTO 440                 :rem 76
450 POKEW,PV:POKEW+C,PC:GOTO190       :rem 235
460 KX=SX:KX=KX+1:J9=PEEK(KX)        :rem 81
470 IFJ9<>BLANDJ9<>DITHE NKX=KX+21:GOSUB800
    :J9=PEEK(KX):IFJ9<>BLANDJ9<>DITHE N49
    0                                  :rem 52
480 POKESX,BL:SX=KX:GOTO500           :rem 253
490 KX=KX-44:J9=PEEK(KX):IFJ9=DIORJ9=BLTH
    EN480                             :rem 152
500 POKESX,SN:POKESX+C,7:RETURN        :rem 59
510 KX=GX:KX=KX+JY(RND(1)*5):GOSUB800:IFP
    EEK(KX)=BL THEN POKEGX,BL:GX=KX   :rem 37
520 POKEGX,39:POKEGX+C,3:GC=GC-1     :rem 187
530 IFGC<=. THEN GC=.:GR=0:POKEGX+C,4
                                :rem 146
540 RETURN                             :rem 121
550 PRINT"[WHT]{6 SPACES}HIT ANY KEY":WAI
    T198,1                             :rem 148
560 PRINT"[CLR]{4 DOWN} ADVANCE OR NOT A/
    N ";                               :rem 192
570 GETA$:IFA$<>"A" AND A$<>"N" THEN570
                                :rem 29
580 PRINT A$                           :rem 143
590 IFA$="A" THEN AD=1                 :rem 118
600 IFA$="N" THEN AD=0                 :rem 122
610 PRINT"[3 DOWN] LEVEL 1-6?";       :rem 33
620 GETA$:IFA$<"1" OR A$>"6" THEN620 :rem 65
630 PRINTA$:LV=VAL(A$):PRINT"[CLR]"
                                :rem 219
640 NM=2:GC$="":JY(1)=-22:JY(2)=22:JY(4)=
    -1:JY(8)=1:X1=7932:JY(3)=0:SX=7695
                                :rem 172
650 JY(5)=-23:JY(6)=21:JY(7)=0:JY(9)=-21:
    JY(10)=23:C=30720                :rem 132
660 M1=7790:M2=8163:M3=374:M4=37137:M5=15
    :SN=37:U=1:F=.7:TW=2:DD=37154:POKE371
    39,0                              :rem 171
670 JS=37152:POKE36878,15:LC=0:BC=0:FV=50
    0                                  :rem 190

```





"Things In The Dark," IBM PC/PCjr version.

```

680 BL=32:M7=32:RO=33:DI=41:PD=8000:SZ=10
    00                                :rem 205
690 LS=0:SC=0:GC=0:GR=0:SF=0:RETURN
    00                                :rem 179
700 FORA=1TO4:FORB=1TO2:README%(A,B):NEXT
    B,A:RETURN                        :rem 249
710 DATA 34,2,35,5,36,6,41,1       :rem 81
720 NM=NM-1                          :rem 106
730 FORZ1=1TO3:FORZ2=200TO150STEP-1:POKE3
    6874,Z2                          :rem 204
740 NEXTZ2,Z1:POKE36874,0:POKEX1,BL:X1=79
    32:POKEX1,BL:RETURN              :rem 53
750 PRINT"{HOME}{5 DOWN}{6 RIGHT}{WHT} GA
    ME OVER "                        :rem 222
760 PRINT"{5 RIGHT}{WHT} PLAY AGAIN? "
    00                                :rem 217
770 GETA$:IFA$<>"Y"ANDAS$<>"N"THEN770
    00                                :rem 57
780 IFA$="Y"THEN120                  :rem 47
790 POKE828,0:SYS828                 :rem 168
800 IFKX<M1THENKX=KX+M3              :rem 225
810 IFKX>M2THENKX=KX-M3              :rem 231
820 RETURN                          :rem 122
830 WAITM4,M7,0:WAITM4,M7,32:RETURN
    00                                :rem 168

```

## Program 5: Things In The Dark For PC/PCjr

Version by Kevin Mykytyn, Editorial Programmer  
Refer to "COMPUTE!'s Guide To Typing In Programs"  
before entering this listing.

```

BG 10 DEFINT A-L:DEF SEG=0:POKE 1047,(PEEK
    (1047)AND 223) OR 64:DEF SEG
PE 20 KEY OFF:SCREEN 1,0:CLS:CIRCLE (50,50
    ),50,,1
EN 30 PAINT (50,50),3:LOCATE 10,25:PRINT "
    THINGS":LOCATE 13,27:PRINT "IN":LOCA
    TE 16,24:PRINT "THE DARK"
BG 40 PLAY "MB T64 O3 L8 CBA# O2DFL7F# O
    1 G"
LE 50 FOR N=1 TO 15:A=INT(RND(1)*26)+16:B=
    INT(RND(1)*8)+1:LOCATE B,A:PRINT ". "
    :FOR TD=1 TO 200:NEXT:NEXT:FOR TD=1
    TO 1000:NEXT
OK 60 DEF SEG:GOSUB 310:GOSUB 380:GOSUB 43
    0:CLS
JO 65 CLS:PX=20:PY=12
NL 70 DEF SEG = 0:POKE 1050,PEEK(1052):DEF
    SEG:FL=0:LOCATE PY,PX:PRINT BL$:NM
    =NM-1:IF NM=<0 THEN LOCATE 1,24:PRIN

```

```

T " " :GOTO 690
IK 80 LOCATE PY,PX:PRINT BL$:DEF SEG :POK
    E DS,3:LOCATE 1,1:PRINT "GC":LOCATE
    3,1:PRINT "SCORE":LOCATE 3,27:PRIN
    T "T":LOCATE 1,16:PRINT"LV"
KP 90 LOCATE 1,24:PRINT " " :PX=20
    :PY=12:PPX=20:PPY=12:N=0:FOR A=1 TO
    NM-1:LOCATE 1,30-A:DEF SEG:POKE DS,3
    :PRINT CHR$(128):NEXT:TU=55-6*LV:T1=
    TU
KO 100 LOCATE 5,1:PRINT" "
FA 110 T1=T1-N1:DEF SEG:POKE DS,1:LOCATE 3
    ,8:PRINT SC:LOCATE 3,31:PRINT T1:LO
    CATE 1,4:PRINT GC:GOSUB 160:GOSUB 2
    20:IF FL=1 THEN GOSUB 740:GOTO 70 E
    LSE IF T1=0 THEN NM=0:GOTO 70
PF 120 IF SC=>SNSC THEN SF=1:SNSC=SNSC+100
    0:LOCATE SY,SX :PRINT BL$:SX=N1:S
    Y=INT(RND(N1)*N7+N10):LOCATE GX,GY:
    PRINT BL$:GR=0
KJ 130 IF SF THEN GOSUB 665
PK 140 IF GR THEN GOSUB 630
PH 147 IF SC>EXMSC THEN NM=NM+1:EXMSC=EXM
    SC+2500
AD 150 IF SC>HSCL THEN HSCL=HSCL+5000:LV=L
    V+1:GOTO 80:ELSE 110
LI 160 N$=INKEY$:IF N$="" THEN 170 ELSE N=
    ABS(ASC(RIGHT$(N$,N1))-71)
KE 170 ON N GOSUB 180,180,190,190,200,200,
    210,210,210:TY=PY:TX=PX:GOSUB 710:P
    Y=TY:PX=TX:RETURN
PH 180 PY=PY-N1:RETURN
PK 190 PX=PX-N1:RETURN
NF 200 PX=PX+N1:RETURN
NG 210 PY=PY+N1:RETURN
OJ 220 PE=SCREEN(PY,PX):IF PE THEN ON PE-N
    128 GOTO 240,250,260,270,270,280,24
    0
HA 230 GOTO 290
KJ 240 FL=1:GOTO 290
KE 250 SC=SC+N100:LS=LS+N100:T1=TU:GOTO 29
    0
CB 260 SC=SC+N10:LS=LS+N10:T1=TU:GOTO 290
LH 270 SC=SC+N200:LS=LS+N200:T1=TU:GR=N1:S
    F=0:GC=N50-N6*LV:CG=N3:GX=RND(N10)+
    N10:GY=GX:IF SF THEN SF=0:LOCATE SX
    ,SY:PRINT BL$:GOTO 290:ELSE 290
EA 280 SC=SC+N400:LS=LS+N400:T1=TU:GR=0!:L
    OCATE GX,GY:PRINT BL$:GOTO 290 ELS
    E GOSUB 530:GOTO 70
EI 290 LOCATE PPY,PPX:PRINT BL$:LOCATE PY
    ,PX:DEF SEG:POKE DS,N3:PRINT RO$:P
    PX=PX:PPY=PY
GI 300 IF RND(N1)>NP4 THEN RETURN ELSE X=I
    NT(RND(N1)*N18)+N6:Y=INT(RND(N1)*N4
    0)+N1:IF SCREEN(X,Y) THEN RETURN EL
    SE C=INT(RND(N1)*N4)+N1:LOCATE X,Y:
    DEF SEG:POKE DS,A(C,N2):PRINT CHR$(
    A(C,N1)):RETURN
OI 310 REM
EC 320 DEF SEG=&H1700:FOR DOTPOS =0 TO 79:
    READ DOTDATA:POKE DOTPOS,DOTDATA:NE
    XT
IL 330 DEF SEG=0
JG 340 FOR VECTOR=0 TO 2:POKE (&H7C+VECTOR
    ),0:NEXT:POKE &H7F,&H17
MH 350 RETURN
PL 360 DATA 24,36,24,126,90,90,24,60,126,1
    53,255,195,90,126,36,102,126,90,126
    ,255,24,60,36,102,24,36,24,60,126,6
    0,66,195
JO 370 DATA 0,0,12,190,245,67,0,0,0,0,48,1
    21,175,194,0,0,66,126,90,60,231,129

```



```

,195,0,66,126,90,60,255,129,195,0,6
5,93,42,28,42,73,20,54,0,0,0,0,255,
0,0,0
NB 380 REM set up variables
HK 390 FOR A=1 TO 4:FOR B=1 TO 2:READ A(A,
B):NEXT B,A
CH 400 DATA 129,3,130,1,131,1,136,2
NA 410 DS=&H4E:N1=1:N2=2:N3=3:N4=4:N5=5:N6
=6:N7=7:N25=25:N40=40:NP4=.4:ROS=CH
R$(128):BL$=CHR$(32):N10=10:N100=10
0:N200=200:N400=400:N50=50:N3=3:CG=
3:N18=18:N128=128:HSCL=5000:GR$=CHR
$(134):SC=0:DX=1:SN$=1000:SF=0:GR=
0:SN$=CHR$(132):GC=0
CI 420 N23=23:EXMSC=2500:SX=20:SY=20:GX=12
:GY=12:RETURN
LJ 430 CLS:PRINT:PRINT " Land the
robot "CHR$(128)" on the "
FF 440 PRINT:PRINT " Gremlins "
CHR$(131)".. 10 pts"
WK 450 PRINT:PRINT " Blockheads "
CHR$(130)".. 100 pts"
BI 460 PRINT:PRINT " Snakes "
CHR$(132)".. 200 pts"
BE 470 PRINT:PRINT " Blue Graps "
CHR$(134)".. 400 pts"
NM 480 PRINT:PRINT:PRINT " Avoid the norf
s ";CHR$(129);" and the purple"
OI 490 PRINT " graps A dinit "CHR$(136)
" is not worth any ":PRINT " poin
ts but a norf cannot land on a
dinit."
KF 500 PRINT:PRINT " Hit any key t
o continue"
ED 510 N$=INKEY$:IF N$="" THEN 510
BH 520 CLS:PRINT:PRINT " You must score
before the turn counter T:
reaches 0. The graps remai
n blue until the grap counter
GC: reaches 0."
CH 530 PRINT:PRINT " You earn one chance
at a snake every 1000 poi
nts and at a grap every sna
ke."
JH 540 PRINT:PRINT " Use cursor keys
to move."
LN 550 PRINT:PRINT " Hit any key t
o start"
CJ 560 N$=INKEY$:IF N$="" THEN 560
HD 570 CLS:LOCATE 4,8:PRINT "ADVANCE OR NO
ADVANCE A/N"
CH 580 N$=INKEY$:IF N$="A" THEN AD=1 ELSE
IF N$="N" THEN AD=0 ELSE 580
AE 590 LOCATE 6,5:PRINT "LEVEL ? (1-6) 1 I
S THE EASIEST"
OO 600 N$=INKEY$:IF N$<"1" OR N$>"6" THEN
600 ELSE LV=VAL(N$)
NC 610 RETURN
PP 620 DEF SEG=0:FOR VECTOR=0 TO 3:POKE (&
H7C+VECTOR),OLDVEC(VECTOR):NEXT
LA 630 TY=GX:TX=GY:TX=TX+SGN(RND(N1)*N2-N1
):TY=TY+SGN(RND(N1)*N2-N1):GOSUB 71
0:PG=SCREEN(TY,TX):IF PG THEN 640 E
LSE LOCATE GX,GY:PRINT BL$:GX=TY:GY
=TX
MP 640 LOCATE GX,GY:DEF SEG:POKE DS,N1:PRI
NT GR$:
JH 650 GC=GC-1:IF GC<0 THEN GR=0:GC=0:LOCA
TE GX,GY:DEF SEG:POKE DS,N2:PRINT C
HR$(135);
NM 660 RETURN
DO 665 TX=GX:TY=SY:TX=TX+N1:IF TX<1 OR TX>
40 THEN TY=TY+1
AD 670 GOSUB 710:SP=SCREEN(TY,TX):IF SP TH

```

```

EN TY=TY+1:TX=TX-1:GOSUB 710:SP=SCR
EEN(TY,TX):IF SP THEN TY=TY-2:GOSUB
710:SP=SCREEN(TY,TX):IF SP THEN 68
0

```

```

CM 675 LOCATE SY,SX:PRINT BL$:SX=TX:SY=TY
KI 680 LOCATE SY,SX:PRINT SN$:RETURN
NF 690 DEF SEG:POKE DS,3:LOCATE 4,15:PRINT
"PLAY AGAIN?"
HF 700 N$=INKEY$:IF N$="Y" THEN GOSUB 570:
GOSUB 410:CLS:GOTO 70:ELSE IF N$="N
" THEN CLS:END:ELSE 700
GA 710 IF TX<N1 THEN TX=N40:TY=TY+N1:ELSE
IF TX>N40 THEN TX=N1:TY=TY+N1
DA 720 IF TY<N6 THEN TY=N23 ELSE IF TY>N23
THEN TY=N6
MH 730 RETURN
NI 740 FOR A=1 TO 3:FOR B=90 TO 40 STEP -1
:SOUND B,.2:NEXT B,A:RETURN

```

## Program 6: Things In The Dark For Apple

Version by Rob Terrell, Programming Assistant  
Refer to "COMPUTE!'s Guide To Typing In Programs"  
before entering this listing.

```

10 HIMEM: 141 * 256
20 GOTO 730
30 NK = 1000:MN = 1:MS = 2500:SC = 0:LV
= 1:LH = 1:SF = 0:GF = 0
40 RH = 20:RV = 12: GOSUB 1450:SH = 1:S
V = 12:GV = 10:GH = 40:NL = 5000
50 GOTO 220
60 NM = SCRN( X,2 * Y) + 16 * SCRN( X
,2 * Y + 1):NM = NM - 128
70 RETURN
80 VTAB 21: HTAB 1: PRINT "GRAP: "GC: TAB(
28):"ROBOTS: "MN" ": PRINT "SCORE
: "SC: TAB( 28):"TIME: "TC" ": PRINT
"LEVEL: "LE" ";
90 RETURN
100 TC = TC - (1 / 2 = INT (1 / 2))
110 I = I + 1: IF PEEK ( - 16384) < 12
8 THEN 130
120 GET A$:K = ASC (A$)
130 LH = RH:LV = RV
140 RV = RV + (K = 75) - (K = 73) + (RV
= 1 AND K = 73) * 20 - (RV = 20 AND
K = 75) * 20
150 RH = RH + (K = 76) - (K = 74) + (RH
= 1 AND K = 74) * 40 - (RH = 40 AND
K = 76) * 40
160 X = RH - 1:Y = RV - 1: GOSUB 60
170 IF NM = 32 THEN 220
180 IF NM = 35 OR NM = 36 THEN SC = SC
+ 10 + (NM = 35) * 90: GOSUB 1450
: GOSUB 80: GOTO 220
190 IF NM = 37 OR NM = 94 THEN SC = SC
+ 200:SF = 0:GF = 1:GC = 70 - LE *
10:GC = (GC = 10) * 10 + GC: GOSUB
1450:SH = 1:SV = 12:GH = 40:GV = 1
0: GOSUB 80: GOTO 220
200 IF NM = 39 THEN SC = SC + 400: GOSUB
1450:GF = 0: GOSUB 80: GOTO 220
210 IF NM = 47 OR NM = 64 THEN 650
220 HTAB LH: VTAB LV: PRINT " "
230 POKE - 16336,0: POKE - 16336,0
240 HTAB RH: VTAB RV: PRINT "!"
250 L = 16 - LE:HO = INT ( RND (8) * L
) + 1
260 IF SF THEN 470
270 IF TC = - 1 THEN 690
280 IF GF THEN 570
290 IF TC < 20 THEN S = PEEK ( - 1633
6)

```



```

300 GOSUB 80
310 IF HO = 5 OR HO = 6 OR HO > 8 THEN
100
320 IF HO = 3 THEN PC$ = "*"
330 IF HO = 4 THEN PC$ = "$"
340 IF HO = 1 OR HO = 2 AND LE > 3 THEN
PC$ = "@"
350 IF HO = 7 THEN 430
360 TH = INT ( RND (5) * 40) + 1:TV =
INT ( RND (5) * 20) + 1
370 X = TH - 1:Y = TV - 1: GOSUB 60: IF
NM < > 32 THEN TH = TH + (TH < >
40):TV = TV + 2 * (TV < 19)
380 HTAB TH: VTAB TV: PRINT PC$
390 IF SC = > NK AND NOT SF THEN NK =
NK + 1000: IF NOT GF THEN SF = 1
400 IF SC > = MS THEN MS = MS + 2500:
MN = MN + 1: GOSUB 80
410 IF SC > NL AND AF THEN NL = NL + 5
000:LE = LE + (LE < 6)
420 GOTO 100
430 DX = DX - 1 + (DX = 1) * 40:DY = DY
- (DX = 0) + (DX = 0) * (DY = 1) *
20
440 X = DX - 1:Y = DY - 1: GOSUB 60: IF
NM = 32 THEN 460
450 DX = INT ( RND (4) * 39) + 1:DY =
INT ( RND (4) * 19) + 1:X = DX -
1:Y = DY - 1: GOSUB 60: IF NM < >
32 THEN 100
460 HTAB DX: VTAB DY: PRINT "*": GOTO
100
470 HTAB SH: VTAB SV: PRINT " "
480 SH = SH + 1:X = SH - 1:Y = SV - 1:
GOSUB 60: IF NM = 32 OR NM = 42 THEN 540
490 SV = SV + 1:Y = SV - 1: GOSUB 60: IF
NM = 32 OR NM = 42 THEN 540
500 SV = SV - 2:Y = SV - 1
510 IF SV < 1 THEN SV = 20:Y = SV - 1
520 GOSUB 60: IF NM = 32 OR NM = 42 THEN
540
530 GOTO 550
540 SH = SH + (SH < 1) * 40 - (SH > 40)
* 40:SV = SV + (SV < 1) * 20 - (S
V > 20) * 20
550 HTAB SH: VTAB SV: IF PS$ = "^" THEN
PS$ = "%": PRINT PS$: GOTO 270
560 PS$ = "^": PRINT PS$: GOTO 270
570 HTAB GH: VTAB GV: PRINT " "
580 GD = INT ( RND (8) * 4):GH = GH +
(GD = 0) - (GH = 40 AND GD = 0) *
40 - (GD = 1) + (GH = 1 AND GD = 1
) * 40
590 GV = GV - (GD = 2) + (GV = 1 AND GD
= 2) * 20 + (GD = 3) - (GV = 20 AND
GD = 3) * 20
600 X = GH - 1:Y = GV - 1: GOSUB 60: IF
NM < > 32 THEN 580
610 GP$ = ""
620 GC = GC - 1: IF GC < = 0 THEN GP$ =
"/":GF = 0
630 HTAB GH: VTAB GV: PRINT GP$
640 GOTO 290
650 FOR J = 1 TO 3: FOR I = 1 TO 4: FOR
Z = 1 TO 3: POKE - 16336,0: POKE
- 16336,0: NEXT Z: POKE - 16336,
0: NEXT I: POKE - 16336,0: POKE -
16336,0: POKE - 16336,0: FOR Z =
1 TO 9:S = PEEK ( - 16336): FOR W
= 1 TO 10: NEXT W: NEXT Z: NEXT J
660 GOSUB 1450: IF GF THEN HTAB GH: VTAB
GV: PRINT " "
HTAB RH: VTAB RV: PRINT " ": VTAB
LV: HTAB LH: PRINT " "
680 IF MN > 0 THEN MN = MN - 1:RH = 20
:RV = 12:K = 0: GOTO 220
690 VTAB 24: HTAB 1: PRINT "GAME OVER.
PLAY AGAIN? (Y/N) ": GET A$: IF
A$ < > "Y" AND A$ < > "N" THEN 6
90
700 IF A$ = "Y" THEN GOSUB 940:K = 0:
GOTO 30
710 TEXT : HOME : END
720 REM INTRODUCTION
730 HOME : VTAB 8: PRINT "THINGS": PRINT
: PRINT "IN THE": PRINT : PRINT ,
" DARK": VTAB 12: PRINT SPC( 14):
INVERSE : VTAB 21: PRINT "PLEASE
WAIT": NORMAL
740 GOSUB 990
750 GOSUB 1120
760 DY = INT ( RND (5) * 19) + 1:DX =
INT ( RND (5) * 39) + 1
770 HOME : HGR : POKE 6,0: POKE 7,141:
POKE 54,0: POKE 55,3: CALL 1002
780 GOSUB 790: GOTO 30
790 TEXT : HGR : PRINT "INSTRUCTIONS..
"
800 PRINT "MOVE AROUND THE SCREEN USIN
G THE I-J-K-LKEYS. ANY OTHER KEY P
AUSES ACTION."
810 HTAB 20: VTAB 12: PRINT "!": HTAB
1: GOSUB 1430: VTAB 24: PRINT : PRINT
: PRINT
820 VTAB 22: PRINT "RUN INTO A GREMLIN
... 10 PTS."
830 GOSUB 1420: PRINT "$": GOSUB 1430
840 PRINT " BLOCKHEAD ...100 PTS."
850 GOSUB 1420: PRINT "$": GOSUB 1430
860 PRINT " SNAKE ...200 PTS."
870 GOSUB 1420: PRINT "%": GOSUB 1430
880 PRINT " GOOD GRAP ...400 PTS."
890 GOSUB 1420: PRINT "'": GOSUB 1430
900 VTAB 24: HTAB 1: PRINT "DO NOT RUN
INTO A NORF OR A BAD GRAP"
910 PRINT "OR YOU WILL BE ZAPPED OUT O
F EXISTENCE!": PRINT
920 GOSUB 1420: PRINT "@": VTAB 14: HTAB
20: PRINT "/": GOSUB 1430
930 HTAB 1: VTAB 24: PRINT : PRINT
940 PRINT : PRINT : PRINT : PRINT : VTAB
21: PRINT "(A)DVANCE/(N)O ADVANCE:
": GET A$:AF = (A$ = "A")
950 HTAB 1: PRINT : PRINT
960 PRINT "STARTING LEVEL (1-6): ": GET
LE$:LE = VAL (LE$): IF LE > 6 OR
LE < 1 THEN VTAB 24: GOTO 950
970 HOME : HGR
980 RETURN
990 X = 0: FOR I = 768 TO 852: READ A:X
= X + A: POKE I,A: NEXT : IF X <
> 7734 THEN PRINT "ERROR IN 1ST
SET OF DATA STATEMENTS.": STOP
1000 DATA 133,69,134,70,132,71,166,7
1010 DATA 10,10,176,4,16,62,48,4
1020 DATA 16,1,232,232,10,134,27,24
1030 DATA 101,6,133,26,144,2,230,27
1040 DATA 165,40,133,8,165,41,41,3
1050 DATA 5,230,133,9,162,8,160,0
1060 DATA 177,26,36,50,48,2,73,127
1070 DATA 164,36,145,8,230,26,208,2
1080 DATA 230,27,165,9,24,105,4,133

```



```

1090 DATA 9,202,208,226,165,69,166,70
1100 DATA 164,71,76,240,253
1110 RETURN
1120 X = 0: FOR I = 36096 TO 36863
1130 READ A: X = X + A
1140 IF A < 0 THEN B = A * - 1: FOR Z
= 1 TO I + 1: POKE Z,0: NEXT Z: I =
I + B: NEXT I
1150 IF I = > 36864 THEN 1400
1160 POKE I,A: NEXT I
1170 DATA 0,0,0,0,0,0
1180 DATA 0,0,28,62,28,8,127,8
1190 DATA 28,20,0,0,0,0,0,0
1200 DATA 0,0,62,42,62,8,8,28
1210 DATA 62,34,8,28,42,62,8,28
1220 DATA 54,99,0,0,0,51,76,0
1230 DATA 0,0,0,0,0,0,0,0
1240 DATA 0,0,62,28,8,28,62,99
1250 DATA 65,65,0,0,0,0,0,0
1260 DATA 0,0,0,0,0,0,0,0
1270 DATA 0,0,65,34,20,127,8,28
1280 DATA 34,99,0,0,0,0,0,0
1290 DATA 0,0,0,0,0,0,0,0
1300 DATA 0,0,0,0,0,0,0,0
1310 DATA 0,0,0,0,0,0,0,0
1320 DATA 0,0,65,65,99,62,28,8
1330 DATA 28,62,0,0,0,0,0,0
1340 DATA -120
1350 DATA 0,28,127,93,119,2 0,28
1360 DATA 127,99,0,0,0,0,0,0
1370 DATA -224
1380 DATA 0,0,0,0,76,51
1390 DATA -300
1400 IF X < > 2444 THEN PRINT "ERROR
IN 2ND SET OF DATA STATEMENTS.":
STOP
1410 RETURN
1420 HTAB 20: VTAB 12: RETURN
1430 VTAB 24: PRINT "PRESS ANY KEY TO
CONTINUE":
1440 WAIT - 16384,128: POKE - 16368,
0: VTAB 22: HTAB 11: RETURN
1450 TC = 70 - LE * 10: RETURN

```

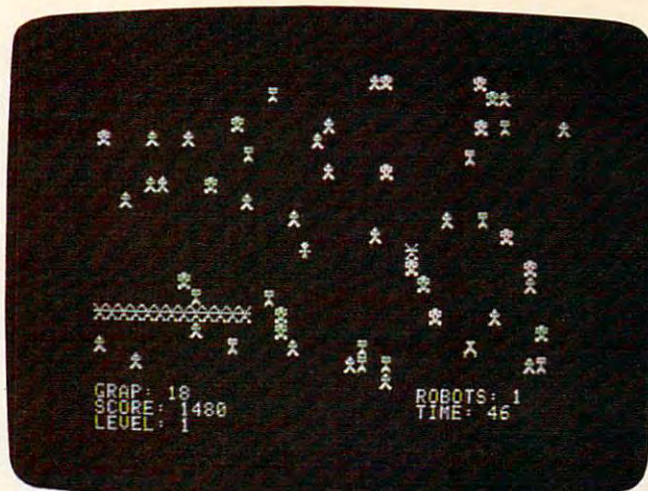
## Program 7: Things In The Dark For TI

Version by Patrick Parrish, Programming Supervisor  
Refer to "COMPUTE!'s Guide To Typing In Programs"  
before entering this listing.

```

100 GOSUB 1200
110 GOSUB 710
120 GOSUB 1030
130 GOSUB 1800
140 GOTO 190
150 FOR I=1 TO LEN(H$)
160 CALL HCHAR(R,C+I,ASC(SEG$(H$,I,
1)))
170 NEXT I
180 RETURN
190 CALL CLEAR
200 PRINT TAB(2); "GC=0"; TAB(23); CHR
$(136)::
210 PRINT TAB(2); "SC=0"; TAB(13); "L=
"; STR$(LV); TAB(23); "T="; STR$(TM
-(LV-1)*10)
220 PRINT ::::::::::::::::::::
230 CALL HCHAR(4,1,126,32)
240 RANDOMIZE
250 FOR I=1 TO 5
260 R=INT(RND*20)+5
270 C=INT(RND*31)+1
280 IF (R=13)*(C=16) THEN 260

```



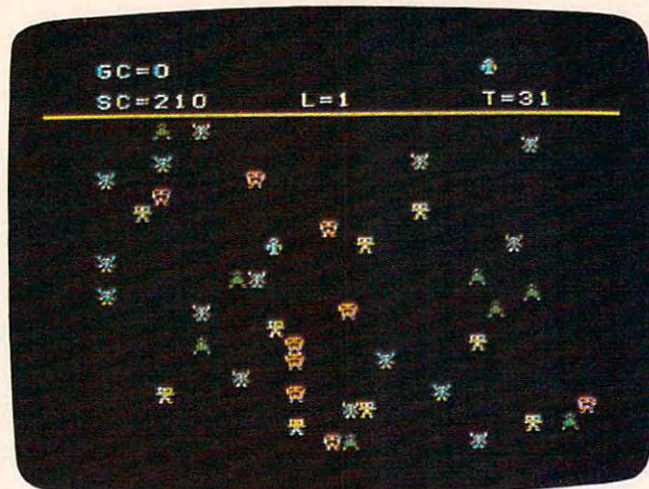
"Things In The Dark," Apple version.

```

290 CALL HCHAR(R,C,G(RND*3))
300 NEXT I
310 CALL HCHAR(RR,RC,G(7))
320 OLDRC=RC
330 OLDR=RR
340 H$=STR$(T)&" "
350 R=3
360 C=26
370 GOSUB 150
380 IF T=0 THEN 2350
390 CALL KEY(0,K,S)
400 IF K=80 THEN 2720
410 IF (K<>68)*(K<>69)*(K<>83)*(K<>
88) THEN 440
420 DX=(K=83)-(K=68)
430 DY=(K=69)-(K=88)
440 RR=RR+DY+(RR=5)*20*(DY=-1)-(RR=
24)*20*(DY=1)
450 RC=RC+DX+(RC=1)*31*(DX=-1)-(RC=
31)*30*(DX=1)
460 CALL HCHAR(OLDR,OLDRC,32)
470 CALL GCHAR(RR,RC,L)
480 IF L=32 THEN 540
490 FOR I=0 TO 6
500 IF L<>G(I) THEN 530
510 ON I+1 GOTO 1920,1950,2010,2070
,2190,2280,2070
520 I=6
530 NEXT I
540 CALL HCHAR(RR,RC,G(7))
550 IF GC=0 THEN 640
560 GC=GC-1
570 R=1
580 C=6
590 H$=STR$(GC)&" "
600 GOSUB 150
610 IF (GC<>0)+(GF=0) THEN 640
620 CALL HCHAR(SNR,SNC,G(6))
630 GF=0
640 T=T-1
650 R=RND*19+5
660 C=RND*30+1
670 CALL GCHAR(R,C,L)
680 IF (L<>32)+(RND*3<1) THEN 320
690 CALL HCHAR(R,C,G(RND*3))
700 GOTO 320
710 CALL CLEAR
720 CALL SCREEN(2)
730 PRINT TAB(2); "ppppp"

```





"Things In The Dark" on the TI-99/4A.

```

740 PRINT TAB(4);"p{3 SPACES}p p p
    p p rppq rppq"
750 PRINT TAB(4);"p{3 SPACES}p p p
    pq p p{4 SPACES}p"
760 PRINT TAB(4);"p{3 SPACES}pppp p
    psqp p r q spq"
770 PRINT TAB(4);"p{3 SPACES}p p p
    p sp p p{3 SPACES}p"
780 PRINT TAB(4);"p{3 SPACES}p p p
    p p sppt sppt":::
790 PRINT TAB(8);"I N{3 SPACES}T H
    E":::
800 PRINT TAB(9);"pppq rppq pppq p
    r"
810 PRINT TAB(9);"p p p p p p p
    rt"
820 PRINT TAB(9);"p p p p p t pr
    t"
830 PRINT TAB(9);"p p pppp pppq ps
    q"
840 PRINT TAB(9);"pppt p p p p p
    sq":::
850 GOSUB 2740
860 CALL CLEAR
870 FOR I=3 TO 8
880 CALL COLOR(1,16,2)
890 NEXT I
900 PRINT "LAND THE ROBOT.. ";CHR$(
    136);" ON GREM-","LINS.. ";CHR$(
    128);" 10 PTS, BLOCKHEADS"
910 PRINT "x 100 PTS, SNAKES.. ";CH
    R$(125);" 200","PTS, CYAN GRAPS
    .. ";CHR$(106);" 400 PTS..",,
920 PRINT "AVOID THE NORFS.. ";CHR$(
    117);". BOTH","THE ROBOT AND T
    HE NORF"
930 PRINT "DISAPPEAR WHEN THEY TOUC
    H.,"TOUCHING A RED GRAP IS LIK
    E"
940 PRINT "TOUCHING A NORF. DINITS.
    .";
950 PRINT CHR$(99);"REPEL NORFS."::
960 PRINT "YOU MUST SCORE BEFORE TH
    E","TURN COUNTER T REACHES 0."
970 PRINT "THE GRAPS REMAIN CYAN UN
    TIL","THE GRAP COUNTER GC REACH
    ES","0. YOU EARN ONE CHANCE AT A"
980 PRINT "SNAKE EVERY 1000 PTS AND
    AT","A GRAP EVERY SNAKE. PRESS

```

```

P","TO PAUSE THE ACTION, R TO"
,"RESTART.",,,
990 PRINT TAB(2);"PRESS ANY KEY TO
    CONTINUE"
1000 CALL KEY(0,K,S)
1010 IF S=0 THEN 1000
1020 RETURN
1030 CALL CLEAR
1040 PRINT "ADVANCE (A)/NO ADVANCE
    (N) ";
1050 CALL KEY(0,K,S)
1060 IF S=0 THEN 1050
1070 IF (K<>65)*(K<>78)THEN 1050
1080 PRINT CHR$(K)
1090 AD=-(K=65)
1100 PRINT :::::
1110 PRINT " LEVEL 1-6 (1 IS EASIES
    T) ";
1120 CALL KEY(0,K,S)
1130 IF S=0 THEN 1120
1140 IF (K<>49)*(K<>54)THEN 1120
1150 PRINT CHR$(K)
1160 LV=K-48
1170 T=60-(LV-1)*10
1180 RETURN
1190 REM REDEFINE CHARACTERS
1200 CALL CLEAR
1210 PRINT TAB(9);"PLEASE WAIT..."
1220 FOR I=112 TO 116
1230 READ A$
1240 CALL CHAR(I,A$)
1250 NEXT I
1260 FOR I=1 TO 9
1270 READ A,A$
1280 CALL CHAR(A,A$)
1290 NEXT I
1300 FOR I=5 TO 7
1310 CALL COLOR(1,9,2)
1320 NEXT I
1330 CALL COLOR(2,16,2)
1340 FOR I=9 TO 14
1350 READ A,B
1360 CALL COLOR(I,A,B)
1370 NEXT I
1380 DATA FFFFFFFFFFFFFFFFFF,80C0E0F0
    F8FCFEFF,0103070F1F3F7FFF
1390 DATA FF7F3F1F0F070301,FFFEFCF8
    F0E0C080
1400 DATA 99,415D2A1C2A491436,106,4
    27E5A3CE781C300,117,7E99FFC35A
    7E2466
1410 DATA 118,427E5A3CE781C300,120,
    7E5A7EFF183C2466
1420 DATA 125,00003079AFC20000,126,
    000000FFFF000000
1430 DATA 128,1824183C7E3C42C3,136,
    1824187E5A5A183C
1440 DATA 4,2,8,2,9,2,11,2,13,2,15,2
1450 FOR I=0 TO 7
1460 READ A
1470 G(I)=A
1480 NEXT I
1490 REM CHAR$ & POINT VALUE DATA
1500 DATA 99,128,120,117,106,125,11
    8,136
1510 FOR I=0 TO 6
1520 READ PT(I)
1530 NEXT I
1540 DATA 0,10,100,0,400,200,0
1550 DIM VOC1(96),VOC2(96)
1560 FOR I=1 TO 96

```

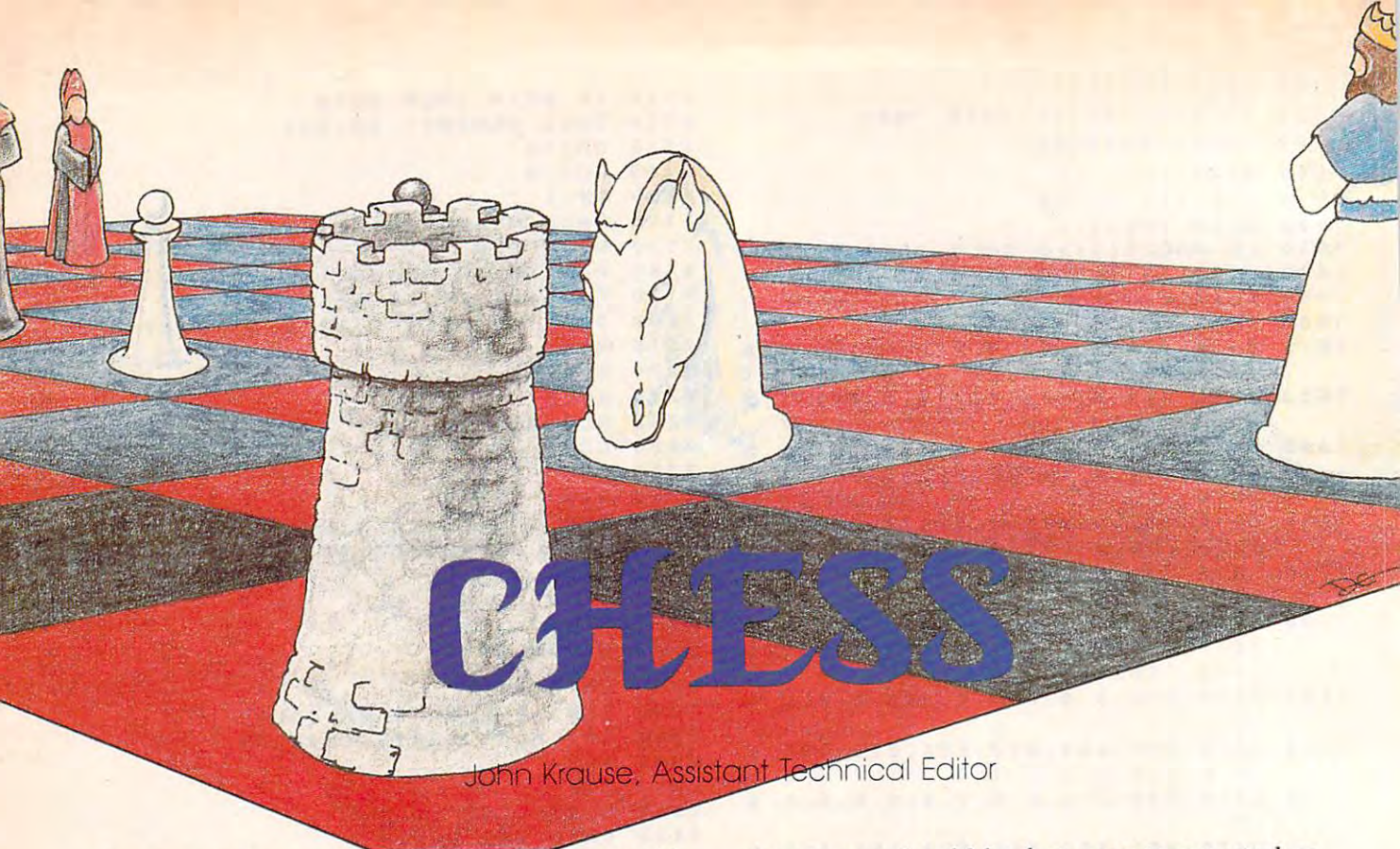


```

1570 READ VOC1(I)
1580 IF VOC1(I)<>0 THEN 1600
1590 VOC1(I)=40000
1600 NEXT I
1610 FOR I=1 TO 96
1620 READ VOC2(I)
1630 IF VOC2(I)<>0 THEN 1650
1640 VOC2(I)=40000
1650 NEXT I
1660 REM MUSIC DATA
1670 DATA 175,0,262,0,262,0,175,0,2
62,0,262,0,175,0
1680 DATA 262,0,262,0,175,0,262,0,2
62,0
1690 DATA 131,0,262,0,262,0,131,0,2
62,0,262,0,131,0,262,0,262,0,1
31,0
1700 DATA 262,0,262,0,175,0,262,0,2
62,0,175,0,262,0,262,0
1710 DATA 175,0,262,0,262,0,175,0,2
62,0,262,0,131,0,262,0
1720 DATA 262,0,131,0,262,0,262,0,1
75,175,175,175,175,175,175,175
,175,175,175,175
1730 DATA 415,0,0,0,0,0,0,466,0,0,0,0
,0
1740 DATA 523,554,523,554,523,554,5
23,0,0,0,0,0,0
1750 DATA 392,0,0,0,0,0,0,415,0,0,0,0
,0
1760 DATA 466,523,466,523,466,523,4
66,0,0,0,0,0,415,0,0,0,0,0
1770 DATA 466,0,0,0,0,0,523,554,523
,554,523,554,523,0,0,0,0,0
1780 DATA 392,0,415,0,466,0,523,523
,523,523,466,466,415,415,415,4
15,415,415,415,415,415,415,415
,415
1790 RETURN
1800 TM=60
1810 SC=0
1820 RR=13
1830 RC=16
1840 NR=2
1850 AR=0
1860 GR=0
1870 SF=0
1880 GF=0
1890 DX=1
1900 RETURN
1910 REM DENIT
1920 CALL SOUND(100,110,2)
1930 GOTO 520
1940 REM GREMLIN
1950 FOR J=0 TO 30 STEP 5
1960 CALL SOUND(100,392,J)
1970 NEXT J
1980 GOSUB 2440
1990 GOTO 520
2000 REM BLOCKHEAD
2010 FOR J=30 TO 0 STEP -10
2020 CALL SOUND(100,294,J)
2030 NEXT J
2040 GOSUB 2440
2050 GOTO 520
2060 REM NORF & RED GRAP
2070 CALL SOUND(150,-3,2)
2080 NR=NR-1
2090 CALL HCHAR(RR,RC,32)
2100 T=TM-(LV-1)*10+1
2110 IF NR=0 THEN 2350
2120 CALL HCHAR(1,25,32)
2130 RR=13
2140 RC=16
2150 DX=1
2160 CALL HCHAR(13,17,32)
2170 GOTO 520
2180 REM CYAN GRAP
2190 FOR J=0 TO 30 STEP 5
2200 CALL SOUND(100,1175,J,-3,J)
2210 NEXT J
2220 GF=0
2230 SF=0
2240 GOSUB 2440
2250 GC=1
2260 GOTO 520
2270 REM SNAKE
2280 FOR J=0 TO 30 STEP 5
2290 CALL SOUND(100,4000,J)
2300 NEXT J
2310 SF=0
2320 GF=-1
2330 GOSUB 2440
2340 GOTO 520
2350 REM END OF GAME SOUND
2360 H$="PLAY AGAIN (Y/N)?"
2370 R=2
2380 C=8
2390 GOSUB 150
2400 CALL KEY(0,K,S)
2410 IF (K<>78)*(K<>89) THEN 2400
2420 IF K=89 THEN 120
2430 STOP
2440 R=3
2450 C=6
2460 SC=SC+PT(I)
2470 GR=GR+PT(I)
2480 AR=AR+PT(I)
2490 H$=STR$(SC)
2500 FOR J=1 TO LEN(H$)
2510 CALL HCHAR(R,C+J,ASC(SEG$(H$,J
,1)))
2520 NEXT J
2530 IF (GR<1000)+((GR>=1000)*((SF=
1)+(GF=1))) THEN 2700
2540 IF GF=-1 THEN 2580
2550 I=5
2560 SF=1
2570 GOTO 2620
2580 I=4
2590 GF=1
2600 GC=21
2610 GR=GR-1000
2620 SNR=RND*19+5
2630 SNC=RND*30+1
2640 CALL GCHAR(SNR,SNC,L)
2650 IF L<>32 THEN 2620
2660 CALL HCHAR(SNR,SNC,G(I))
2670 IF AR<5000 THEN 2700
2680 AR=AR-5000
2690 LV=LV+1+(LV>5)
2700 T=TM-(LV-1)*10+1
2710 RETURN
2720 CALL KEY(0,K,S)
2730 IF K<>82 THEN 2720 ELSE 410
2740 FOR I=1 TO 96
2750 CALL SOUND(100,VOC1(I),2,VOC2(
I),2)
2760 NEXT I
2770 RETURN

```





John Krause, Assistant Technical Editor

*Try to outwit your computer with this fast, multi-level chess program whose intelligence routines are written entirely in machine language. There are versions for the Commodore 64; VIC-20 with at least 8K memory expansion; Ataris with at least 32K RAM; and Apples with at least 48K RAM and a disk drive. All versions except Apple require a joystick.*

The world was amazed, in the late eighteenth century, by a machine that had the astonishing ability to play a good game of chess. It entertained kings and queens. It defeated Napoleon, a master tactician. Hundreds of people paid to compete against it, but eventually it was revealed that a small man was hidden inside the machine.

A chess-playing machine remained only a dream until the late 1950s when the first computer chess game was played. Now, the World Computer Championship, held every three years since 1974, attracts almost as much publicity as the human championship matches. Why has there been so much interest in machines that play games?

One reason is that chess can be used to measure a computer's intelligence. Chess is easy to play, but difficult to master. So difficult, in fact, that some experts believe that a computer would have to be almost as intelligent as a human to become world champion.

Of course, another reason is that chess is just plain fun, but not if you can't find an opponent. To be an entertaining opponent, a computer

chess game should be fast, easy to use, and capable of playing at several different skill levels. "Chess" has all these features and more. Although it's really no match against the best commercial chess games, it *has* managed to defeat these giants of the microcomputer chess world on rare occasions.

### Typing It In

The VIC and 64 versions are in two parts. 64 users should type in Program 1 and save it. Then enter NEW, type in Program 2 and save it with the name CHESS2. The VIC version needs at least 8K of expansion memory. VIC users should substitute the following lines into Program 1 before saving, and then enter NEW, type in Program 3 and save it with the name CHESS2.

```
5 POKE56,60:POKE55,0:CLR           :rem 171
20 IFK<>79727THENPRINT"ERROR IN DATA":STO
   P                                 :rem 129
55 POKE6656,0:POKE44,26:NEW         :rem 85
2080 DATA11,173,20,145,205,127,63,144,18,
    141,127,63,140,128,63           :rem 19
```

If you are using tape instead of disk, in line 40 of Program 1 change the 8 to a 1. Make sure that the second part is saved immediately after the first part on the tape. To run either version, run the first part. The second part will load and run automatically.

The Atari version requires at least 32K RAM. Atari users should simply type in Program 4 and save it before running.

Apple users should consult the accompanying Notes for special instructions.



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10. Audit your energy costs.
11. Keep track of birthdays.
12. List your appointments.
13. Record your phone numbers.
14. Organize your record collection.
15. Manage your next move.
16. Record the club membership.
17. Track your insurance.
18. List your recipes.
19. Create "to do" lists.
20. Plan a wedding.
21. You can keep track of favorite restaurants.
22. And your children can manage their paper routes.
23. Catalogue their baseball cards.
24. Keep track of their butterfly collections.
25. And their stamp collections.
26. They can even list their chores!

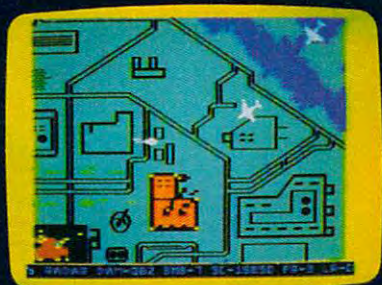
## PFS SOFTWARE The Power of Simplicity

PFS:FILE and PFS:REPORT currently work on Commodore 64, Apple® IBM® Macintosh, Tandy, DEC, Compaq, Hewlett Packard, NEC, Panasonic, Polo, Texas Instruments, Columbia, Corona, Eagle and Hyperion personal computers.  
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A monstrous artificial intelligence directs an endless army of self-replicating robot weapons and a complex of factories hidden on six heavily defended islands. Even as you strike at one island, robots beyond your field of vision continue to multiply...to repair the damage you've done...to attack and destroy.

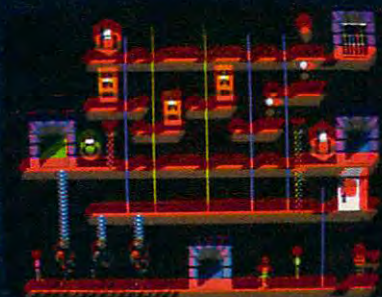
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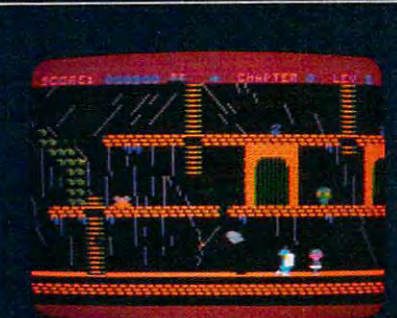


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Poison arrows, runaway boulders, fearsome frogs and mysterious mummies are only a few of the hazards that'll make you wish you weren't your brother's keeper.



## STEALTH™

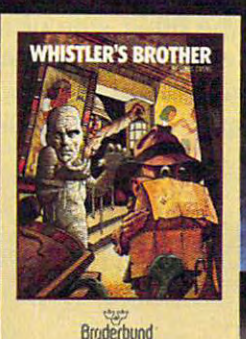
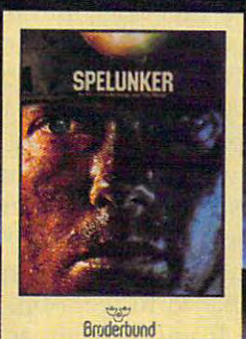
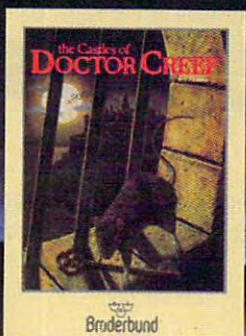
You're all alone on a strange and forbidding planet. On the distant horizon, looming thousands of meters above the blasted landscape, lies your destination: The Dark Tower, home of the mysterious Council of Nine, cruel overlords of a conquered world.

You must maneuver your Stealth Starfighter through an unending assault by the Council's automated arsenal—jets and heat-seeking missiles, photon tanks and anti-aircraft batteries, vaporizing volcanoes and deadly energy fields. Outgunned and outmanned, you must press ever onward, with only your stealth to rely on.

You must reach the Tower. You must destroy it. There's no turning back.

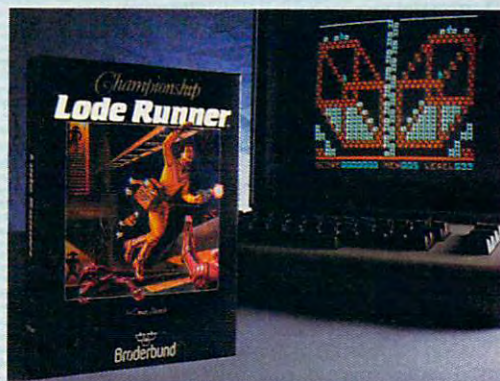






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And if you haven't yet paid your dues on the original *Lode Runner*, don't even think of attempting this championship round.

  
**Broderbund™**



## Joystick Input

After running the program, you will be asked to specify several play options. You can choose among five skill levels; start a new game or set up any position; play against the computer or watch it play against itself; or play either the white or black pieces. All of these options will be discussed in greater detail later, but for now, type 1 at each prompt. This puts you in command of the white pieces versus the computer on level one, the easiest level.

The first time the program is run, you need to wait a few seconds while the computer gets its brain in order. Then the board will be displayed with your pieces on the bottom of the screen and the computer's pieces on the top. You should see a frame around the square in the lower-left corner of the board (the VIC version uses a blinking square). This is the cursor which takes the place of your hand to move pieces around the board.

Use the joystick (plugged into port 2 on the 64, port 1 on the Atari) to move the cursor atop the piece you wish to move. Press and release the joystick button. Now move the cursor to the square you want to move to and tap the button again. Your piece moves to the new square, and the computer responds almost instantly with its move.

## A Spectacular Blunder

Did you make a foolish move? No problem. One of the most valuable features of Chess is the ability to change the position by adding or deleting pieces. This feature is especially useful for those of us who frequently manage to maneuver into a superior position, only to throw it all away in a single, spectacular blunder.

A piece can be deleted by positioning the cursor on the piece and pressing the space bar. To add a piece or change a piece to a different one, move the cursor to the appropriate square and press P, N, B, R, Q, or K for pawn, knight, bishop, rook, queen, or king, respectively. This will put one of *your* pieces on the square. To add one of the computer's pieces, hold down the SHIFT key (CONTROL key on the Atari) while pressing one of these editing keys.

To take back a move, use the editing keys to delete your piece and put it back on its original square. Don't forget to take back the computer's move, too.

The editing feature also enables you to make special moves which cannot be made with the joystick alone such as castling and *en passant* captures. For example, castling can be accomplished by deleting the king and putting it on its new square, and then moving the rook as you normally would with the joystick. Although you can make these special moves, the computer will



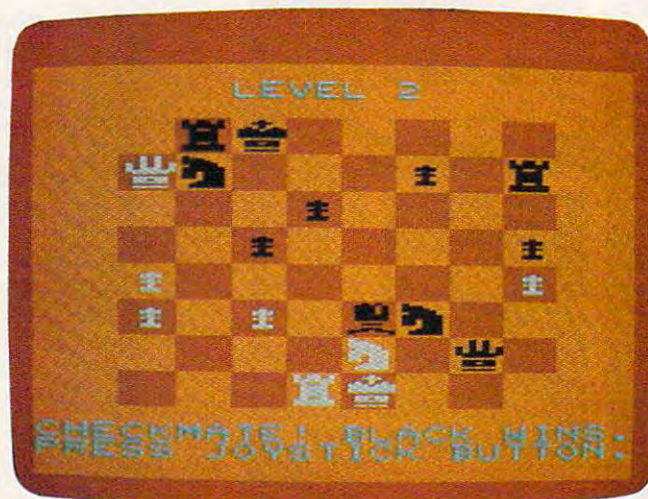
"Chess" on the Commodore 64.

never castle or capture *en passant* because, due to their complexity, these moves were not included in its thinking routine.

## Strange Chess

Although the computer will always make a legal move, it doesn't check to see that you do the same. You are free to move any of your pieces to any square without so much as a contemptuous buzz from the computer. If you're an experienced player, this shouldn't be a problem. If you're a beginner, however, you may want to familiarize yourself with the basic rules of chess lest you end up playing strange chess, a personal version which bears little resemblance to the real game. On the other hand, if you like to fudge a bit, the computer will make it easy. It will politely acquiesce to your most surreal moves.

When a pawn reaches the other side of the board, it's automatically promoted to a queen. If you would rather have a knight, bishop, or rook, you can easily make the change using the editing keys.



VIC-20 "Chess."



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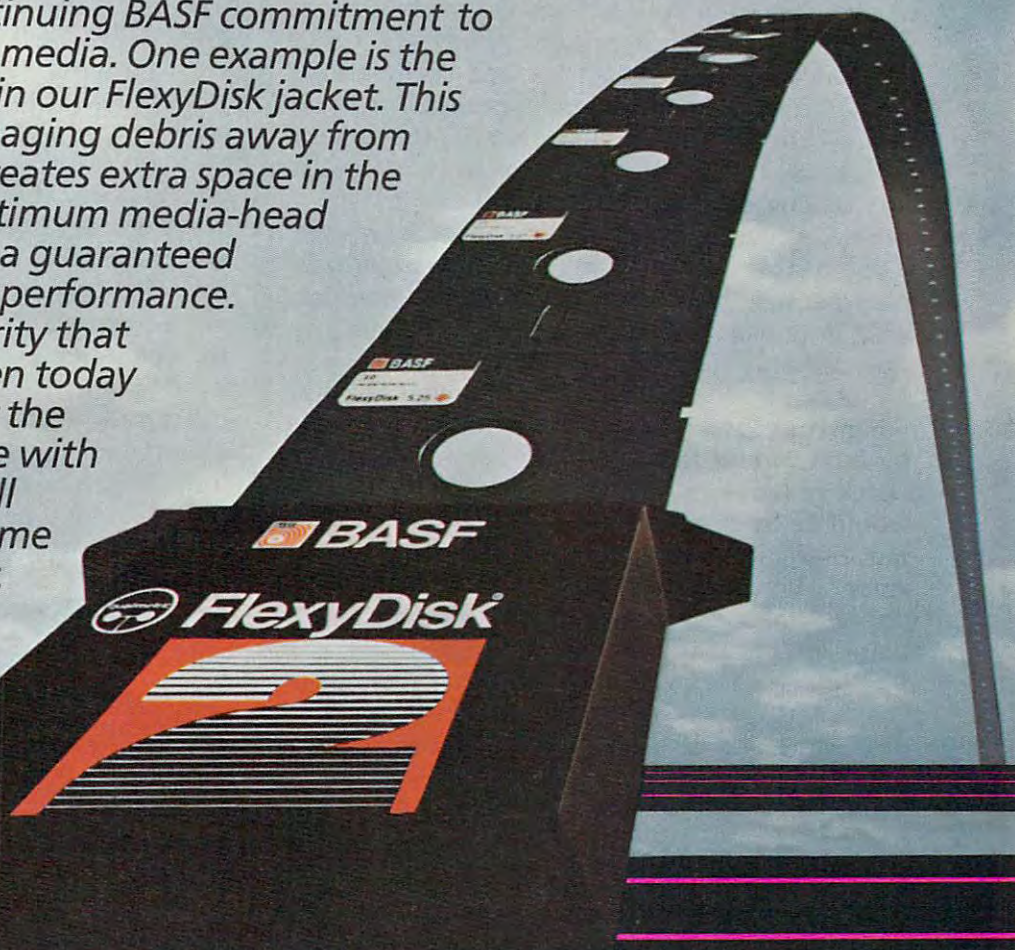
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## Checkmate

The computer thinks by analyzing thousands of possible moves and countermoves and choosing what it considers to be the best move based on the relative value of the pieces (see "How Chess Thinks"). Most positions don't have just one best move but several which are equally good, in which case the computer chooses among them at random. This random factor insures that every game will be different, and makes for varied and interesting play.

Play continues until one side is either checkmated or stalemated. The computer will then stop play and indicate which side has won.

There are a few quirks in the way the computer determines whether checkmate has occurred. On levels three through five, it announces checkmate prematurely. When this happens, the computer has determined that it's impossible to avoid checkmate on the *next* move or two, assuming both sides make the best moves.

Also, the computer doesn't know the subtle difference between checkmate and stalemate. Consequently, when stalemate occurs, it will announce checkmate although, in fact, the game is a draw. Since the computer tries as hard as it can to checkmate its opponent, it will also try to achieve stalemate, possibly forcing a draw when it could have won. Fortunately, this rarely happens because the conditions for stalemate exist only in unusual circumstances such as when one side has only the king remaining.

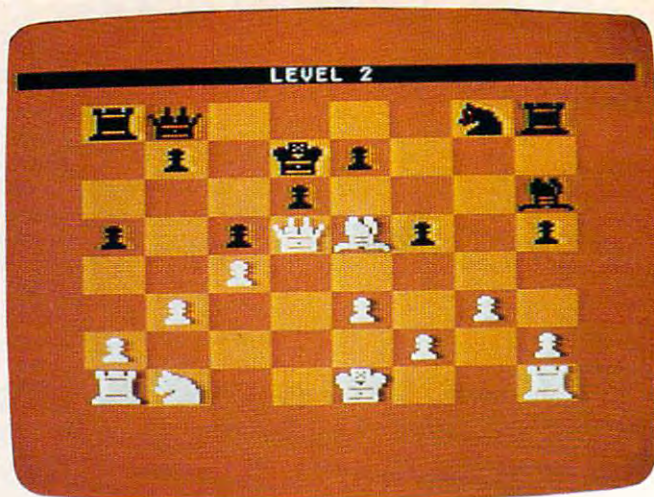
Also, the computer won't give you any hint when your king is in check (not checkmate). So be extra careful that you don't leave your king in check or move into check. Otherwise, your king would be in check during the computer's turn to move—a highly unorthodox if not illegal position. The computer's reply to such a position is unpredictable, but it usually announces checkmate, forcing you to restart the game.

In any case, when the computer announces checkmate, press the joystick button to start a new game. If you want to try out some of the other play options without waiting till checkmate, you can start a new game at any time by pressing RUN/STOP-RESTORE (RESET on the Atari) and running the program again.

## Play Options

When you choose the black pieces, the board will revolve so that you still play from the bottom. Since the player with the white pieces always moves first, you must wait for the computer to move before you will be allowed to make your first move.

If you become mentally exhausted after several bouts against the computer, give your brain a rest and watch the computer play itself. When



"Chess," Atari version.

you select this option, just set the joystick aside and sit back and watch the action. Beginners will find this feature an excellent way to learn some good strategies to use against the computer.

You don't have to begin a game from the starting position. If you choose the option to set up a position, an empty board will be displayed and you can use the editing keys to place pieces on the board in any position. When the position is set up, the computer will start thinking after you make your first move.

This feature is especially useful for continuing a previous game or creating a problem for the computer to solve. It also allows you to experiment with hypothetical or downright ridiculous positions. Live out your fantasy by giving yourself ten queens versus the computer's lone king. The position doesn't even have to be a legal one. You could invent your own type of chess by giving each side two kings, for example, although the computer may get confused trying to determine when checkmate has occurred.



"Chess," Apple version.



[OH NO, NOT AGAIN.]

# SON of ARCHON.

If you took all the hours spent by all the people who've played *Archon* and put them together, there's a good chance it'd amount to more human effort than it took to put a man on the moon.



The Archon Dragon.

What does this mean? Is it a good thing? And why, in light of this, did the people pictured here decide to issue a scorching sequel named *Archon II: ADEPT*?

For starters, we don't really know what it means. Except that a lot of people who had a pretty good time with *Archon* are about to get more of what they like. And people who've yet to experience the best-selling, award-winning, knuckle-whitening original have two good things coming their way.

Point two: If there's a moral issue here, we see it this way: A wise man once said, "I ain't never had too much fun." We agree. And we think that once you get your hands on *Archon II: ADEPT*, you'll see his point.



Jon Freeman, Paul Reiche III and Anne Westfall created *Archon*, the 1983 "Game of the Year" according to *Softline* and *Creative Computing*. Recent evidence, however, indicates they were not satisfied with this.

Now for the third question. Why a sequel? Well, there are sequels and there are sequels. The good ones happen because people just haven't had enough of a good thing. Obviously we're here to tell you that *Archon II: ADEPT* falls into the right category.

Where *Archon* took inspiration from chess, fantasy role-playing characters and arcade combat, *ADEPT* comes more from a world of its own making. Like *Archon*, it pits the forces of good against those of evil. But in place of the chessboard motif there is a map of elements—Earth, Air, Fire



The ADEPT Chimera.



The ADEPT Thunderbird.

and Water. The role of magic is greater. The strategies are deeper. Things move faster. And the hidden algorithms that control the computer's play are considerably smarter.

Having already spent the better part of a month playing *ADEPT* (in order to write this ad, of course), we're quite confident it will seduce you too.

And if, by some strange chance, there is a parallel universe in which computer simulations come to life, we are confident that a large part of its population has Jon Freeman, Paul Reiche III and Anne Westfall to thank for their brief and miserable existence.



## ARCHON™ & ADEPT™

from ELECTRONIC ARTS™



MACHINE REQUIREMENTS: *Archon* is available on the Apple II, II+, IIe & IIc, IBM-PC, PCXT & PCjr, Commodore 64 and Atari. *Archon II: ADEPT* is available on the Commodore 64 and Atari.

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## How Chess Thinks

You've probably heard that if a monkey sat down at a typewriter and pecked randomly at the keys for a long enough period of time, it would eventually type the complete works of Shakespeare. Theoretically, this is indeed possible—given enough time.

There's the rub. At a brisk typing speed of 50 words per minute, it would take that poor monkey billions of years just to type "To be, or not to be." Nevertheless, there is power in trial and error.

### The Minimax Algorithm

Substitute the monkey for a high-speed computer, and this technique becomes a practical method of imitating intelligence. In fact, it has been used with great success in the field of artificial intelligence. This program uses a popular trial-and-error technique known as the *minimax* algorithm.

The computer looks at the present board position and mentally moves the pieces through all the possible combinations of future moves and countermoves up to a certain point, say three moves ahead. For each combination, it calculates a score based on which pieces were captured during the combination. Each piece is worth a certain number of points depending on its general importance: 1 point for a pawn, 3 for a knight or bishop, 5 for a rook, 9 for a queen, and 46 for a king. (Of course, since you lose the game if your king cannot escape capture, the value of a king is actually infinite, but 46 is high enough to convince the computer that it's a bad move.)

When, in a move being examined, the computer captures an opponent's piece, the value of that piece is added to the score. Conversely, when one of the computer's pieces is captured, its value is subtracted from the score. Thus, a high score is considered good for the computer, and a low score is good for its opponent.

The task is to find the combination that

represents best play for *both* sides. This combination is not necessarily the one with the maximum score, because while the computer is trying to maximize the score, its opponent is trying just as hard to minimize it. The best combination gives maximum scores during the computer's moves, and minimum scores during the opponent's moves.

After the best combination has been found, the computer's best move in the present position is simply the first move in the combination. The problem has been reduced from analyzing a chess position to finding the maximum and minimum of a series of numbers, which is much better suited to a computer.

### 50 Million Combinations On Level 5

Like most algorithms based on trial and error, this one requires sifting through an enormous number of combinations to find the best one. Fortunately, a few tricks can be used to reduce the combinations to a manageable number. This algorithm uses a technique called *alpha-beta cutoff*. It makes the computer search more intelligently, giving it the seemingly paradoxical ability to find the best move without looking at all the possible combinations. On level 5, for example, instead of having to search through roughly 2 billion combinations, it looks at only 50 million.

Even so, it would take BASIC from now till 1986 to generate that many combinations. That's why the algorithm is programmed in machine language. An advanced programming technique known as *recursion* (making a subroutine call itself) is used to generate all the possible combinations of moves. Capable of analyzing about 5000 combinations per second, this routine provides a moderate challenge at a reasonable playing speed.

One of the advantages of a computer opponent over a human is that you can tell the computer exactly how hard you want it to try to beat you, and it will obediently play at that level of difficulty. This is important because it's no fun if you always lose or always win effortlessly.

You have five skill levels to choose from. The difference between one level and another is the number of moves ahead that the computer

looks. On level 1, for example, it looks two moves ahead (its move and your reply). Each succeeding level looks ahead one more move than the previous level.

Alas, the smarter play on the higher levels doesn't come without a price. The further ahead the computer looks, the more moves it must examine and, hence, the longer it thinks. The thinking time varies greatly depending on the





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34D100



level (about one second per move on level 1; about two hours on level 5).

Here's a rundown of the five levels:

**Level 1: Beginner.** Thinking time: one second. Look ahead: two moves. Fast but dumb.

**Level 2: Intermediate.** Thinking time: five seconds. Look ahead: three moves. Provides a reasonable challenge for impatient players.

**Level 3: Tournament.** Thinking time: two minutes. Look ahead: four moves. Since the usual time limit for tournament play is 40 moves in two hours, an average of three minutes per move, this level is best suited for serious players.

**Level 4: Mate in two.** Thinking time: 30 minutes. Look ahead: five moves. Capable of solving most mate-in-two problems.

**Level 5: Postal chess.** Thinking time: two hours. Look ahead: six moves. Simulates postal chess games where there is no time limit. Can avoid checkmate in two moves.

The thinking times given here are average times. The actual time ranges from half to twice the average time depending on the position.

Level 4 can be used to solve mate-in-two problems such as those published in many newspapers. Just select the following options: level 4, set up position, computer versus itself. Enter the position using the editing keys, and then make a do-nothing move by positioning the cursor over a white piece and pressing the joystick button twice. After several minutes of deep thought, the computer should respond by moving one of the white pieces (the solution) and announcing checkmate. The only mate-in-two problems that the computer cannot solve are those which involve castling, *en passant* captures, or pawn promotion.

If you have a Commodore 64 or VIC and don't want to type in this program, send a blank cassette or formatted disk, a self-addressed, stamped mailer, and \$3 to the address below, and I'll make you a copy. Be sure to indicate which computer version you want.

John Krause  
402 Monmouth Drive  
Greensboro, NC 27410

## Program 1: VIC And 64 Chess (Program Loader)

Refer to "COMPUTE!'s Guide To Typing In Programs" before entering this listing.

```
10 FORI=15449TO16200:READJ:POKEI,J:K=K+J:
NEXTJ:rem 52
20 IFK<>79786THENPRINT"ERROR IN DATA":STO
P:rem 134
30 POKE631,13:POKE632,13:POKE633,13:POKE1
98,3:rem 79
```

```
40 PRINT"[CLR]{3 DOWN}LOAD"CHR$(34)"CHESS
2"CHR$(34)",8:rem 255
50 PRINT"[5 DOWN}RUN{HOME}:rem 113
2000 DATA21,12,248,237,235,244,8,19,10,11
,1,247,246,245,255:rem 126
2010 DATA9,11,247,245,9,10,1,246,255,46,9
,5,3,3,1:rem 138
2020 DATA0,1,3,3,5,9,46,120,169,192,141,1
28,63,162,0:rem 23
2030 DATA142,127,63,202,142,126,63,76,97,
61,189,108,63,24,125:rem 244
2040 DATA116,63,72,168,185,136,63,188,108
,63,153,136,63,104,168:rem 101
2050 DATA189,76,63,153,136,63,24,105,6,16
8,174,73,63,169,0:rem 109
2060 DATA157,129,63,174,126,63,185,113,60
,56,253,129,63,168,169:rem 108
2070 DATA192,157,129,63,152,224,0,208,34,
221,128,63,48,28,208:rem 243
2080 DATA11,173,4,220,205,127,63,144,18,1
41,127,63,140,128,63:rem 223
2090 DATA173,108,63,141,124,63,173,116,63
,141,125,63,96,221,128:rem 82
2100 DATA63,48,250,240,248,152,157,128,63
,189,75,63,24,105,6:rem 199
2110 DATA168,185,113,60,56,253,128,63,221
,127,63,48,59,224,1:rem 194
2120 DATA240,221,221,127,63,240,50,96,189
,108,63,24,125,116,63:rem 23
2130 DATA141,75,63,168,185,136,63,172,74,
63,208,6,201,1,16:rem 92
2140 DATA192,48,8,201,0,48,186,201,7,240,
182,157,76,63,201:rem 88
2150 DATA6,240,4,201,250,208,12,169,46,15
7,128,63,104,104,104:rem 219
2160 DATA104,76,229,61,188,108,63,185,136
,63,172,75,63,153,136:rem 55
2170 DATA63,188,108,63,169,0,153,136,63,2
36,73,63,208,3,76:rem 108
2180 DATA144,60,232,142,126,63,169,20,157
,108,63,169,16,56,237:rem 43
2190 DATA74,63,141,74,63,254,108,63,188,1
08,63,185,136,63,201:rem 0
2200 DATA7,240,86,172,74,63,240,4,201,0,1
6,77,192,0,208:rem 183
2210 DATA4,201,1,48,69,201,0,16,9,188,108
,63,169,0,56:rem 91
2220 DATA249,136,63,201,1,208,6,32,5,62,7
6,222,61,201,2:rem 175
2230 DATA208,6,32,192,62,76,222,61,201,3,
208,6,32,218,62:rem 234
2240 DATA76,222,61,201,4,208,6,32,230,62,
76,222,61,201,5:rem 223
2250 DATA208,6,32,242,62,76,222,61,32,47,
63,76,222,61,189:rem 47
2260 DATA108,63,201,98,48,150,224,0,240,1
6,169,16,56,237,74:rem 146
2270 DATA63,141,74,63,202,142,126,63,76,1
44,60,173,124,63,24:rem 186
2280 DATA109,125,63,141,125,63,88,96,173,
74,63,208,89,189,108:rem 20
2290 DATA63,24,105,10,168,185,136,63,208,
36,169,10,157,116,63:rem 247
2300 DATA32,21,61,189,108,63,201,31,48,21
,201,39,16,17,24:rem 20
2310 DATA105,20,168,185,136,63,208,8,169,
20,157,116,63,32,21:rem 186
2320 DATA61,189,108,63,24,105,9,168,185,1
36,63,16,8,169,9:rem 65
2330 DATA157,116,63,32,21,61,189,108,63,2
4,105,11,168,185,136:rem 240
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