

What If . . . ? The Popularity Of Strategy Games

COMPUTER'S GAZETTE

\$2.95
December 1984 ©
Issue 18, Vol. 2, No. 12
02220 \$3.75 Canada

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

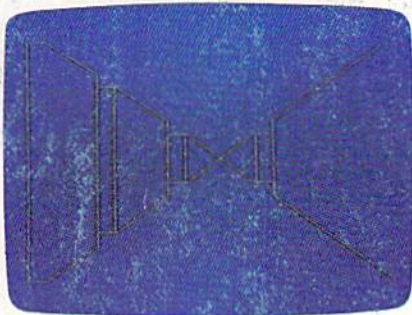
Also In This Issue:

Simple Answers
To Common Questions

Programming
Commodore's
Magic Voice

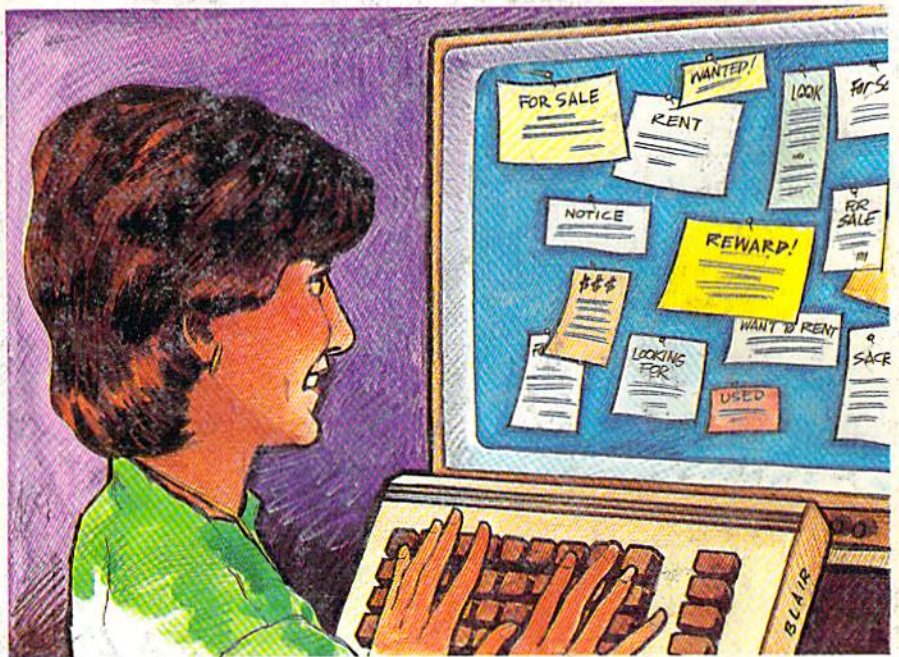
Power BASIC:
Time Clock

And More



3-D Labyrinth

Don't hasten through this maze—you could get hopelessly lost. For the VIC and 64.



C/G Bulletin Board System

Turn your 64 into an electronic bulletin board. The Color/Graphics BBS makes it easy to upload/download, post messages, and send electronic mail.

Auto Line

Save programming time with this versatile line numbering utility for the VIC and 64. Also instantly deletes unwanted lines.

Electronic Trivia

A look at the variety of new trivia games available for the 64.

57087 12



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.



LIFEWARE™



from Word Publishing

One of the ABC Publishing  Companies

Waldenbooks

Available at all stores nationwide.



Apple II series is a registered trademark of Apple Computer, Inc. Commodore 64 is a trademark of Commodore Electronics, Ltd.



You bought a computer to cultivate your kids' minds. Make sure it's bearing fruit, not growing vegetables.

Introducing a whole crop of Learning Adventure games from Spinnaker.

When it comes to cultivating adventurous young minds, the computer's potential is endless.

Unfortunately, the search for software that makes the most of that potential has been endless, too.

That is, until Spinnaker created the Learning Adventure Series. A unique collection of games that reward curiosity with

hours of adventure and learning. So the time kids spend with our games will help them develop valuable skills. Instead of just tired thumbs.

But what really makes our Learning Adventure games unique—educational value aside—is how much fun they are. Which isn't too surprising when you consider you can do things like bargain with aliens, search a haunted house, or build your own railroad empire.

In fact, our games are so much fun, kids will really enjoy developing some very important skills. Deductive reasoning, note taking, and problem solving, for instance.

So, if you're in the market for software that will truly cultivate young minds, pick the Spinnaker Learning Adventure Series.

It's the best way to be sure your search will be fruitful.

Spinnaker Learning Adventure games are available for Apple,® Atari,® IBM® and Commodore 64™ home computers.



It's new! PRESIDENT'S CHOICE.™

Welcome to the White House—you're the President of the United States! Make the right decisions and you'll win re-election. **Ages 13-Adult.**



It's new! ROCK 'N' RHYTHM.™

It's your own recording studio, complete with instruments and equipment. Play and record existing music, or experiment with your own melodies and rhythms. **Ages 10-Adult.**



It's new! TRAINS.™

You're in charge of an old-time railroad—and whether it turns into a bonanza or a bust depends on how well you run it. But either way you'll find that working on this railroad is a challenge—and a lot of fun! **Ages 10-Adult.**

SPINNAKER™
We make learning fun.

Disks for: IBM (PRESIDENT'S CHOICE),
Atari and Commodore 64
(ROCK 'N' RHYTHM and TRAINS).

**WE UNLEASH
THE MUSIC
IN YOU.™**



The INCREDIBLE MUSICAL KEYBOARD™

transforms your computer into an exciting musical instrument.



The Incredible Musical Keyboard can do more than turn your Commodore into a music synthesizer.

Deep within every Commodore 64 lurks the unexpected. A versatile music synthesizer. A music video machine. A three track recorder. And a way to create music that's so easy you'll be playing songs within minutes.

Just place the Incredible Musical Keyboard over the computer keyboard, load the included music software diskette, and you have all you need to make piano, guitar, synthesizer and electronic sounds.

Everything you need to create music is included . . . whether you're a beginner or an accomplished musician.

If you can press a few keys, you have all the skills it takes to create and play music with the Incredible Musical Keyboard.

Just beginning? Attach the included ABC key stickers to the keys and match the letter in the note with the letter on the key and . . . PRESTO! . . . you're playing music instantly. It's easy. It's fun. It unleashes the music in you . . . even if you don't read music.

You already read music? Great! We've included a Melody Chord Songbook featuring hits from today's top recording artists. Or play songs from your own sheet music.

The Incredible Musical Keyboard works with other exciting Sight & Sound Music Software programs, too!

Get the **KAWASAKI SYNTHESIZER** and transform your Commodore 64 into a sophisticated music synthesizer and sound processor. With one keystroke, you can control waveforms, vibrato, sweep and other special effects. Let your imagination soar with the **KAWASAKI RHYTHM ROCKER** creating and recording your own songs while you control eye-popping color graphics that explode across the screen. Create your own music with the **MUSIC PROCESSOR**, a word processor for music. Then record it, edit it and play it back. Use the 99 preset instrument and special effects sounds for endless new creations. Or travel through a complete tutorial on music synthesis with the newest Sight & Sound music program, **3001 SOUND ODYSSEY**. After you've learned the basics of music synthesis, you can use the complex music synthesizer included in the program to

compose your own music, create your own sound effects or simply experiment with the hundreds of pre-programmed sounds.

From the Incredible Musical keyboard to software that plays your favorite hits, we've got them all.

Look for the Incredible Musical Keyboard and the complete line of Sight & Sound music software at your local computer software outlets and music stores. And unleash the music in you.



For more information and a free catalog, phone 1-414-784-5850 or write P.O. Box 27, New Berlin, WI 53151.

SIGHT & SOUND
Music Software, Inc.

WE UNLEASH THE MUSIC IN YOU.™

Quick.

How many plates can
the Juggler juggle?



Chinese Juggler

That depends on you. You are the Juggler and your act is the delicate art of plate spinning. Yours will be a tough act to follow if you succeed in matching colors and spinning plates on all 8 poles at the same time.

As your skill increases, so does the pace and the challenge of the game. You must act with speed and precision or the curtain will come down and your act will be all washed up!

Chinese Juggler is a refreshing departure from the usual shoot-em-ups and strategy games. It's fun, fast-paced and will delight players of any age. For Commodore 64. New from Creative Software.

\$24.95

How do you
moonwalk, snake
and tut?



Break Street

You'll soon become a break dancing expert with our latest bestseller, Break Street. Now that combination of gymnastics, mime, funk, and just plain show-off, leaves the sidewalks and comes home to your Commodore 64.

Individual play guides you through the footwork of moonwalk, backspin, windmill, tut, and the rest of those sidewalk moves. Slow motion and lively musical accompaniment help you perform each move step by step. String together a whole series of moves and record them for future replay.

Catch the beat of the street with Break Street. For individual or team play. New from Creative Software.

\$24.95

**The answers are at
your finger tips.**

What's the capital
of Alaska?



Roll Call USA

Do you know? Get ready to outwit your family and friends with Roll Call USA's fun facts on states, capitals and major industries.

Roll Call USA combines history and geography facts into a colorful question and answer game that challenges your knowledge of the 50 states, their capitals, major industries and statehood dates.

Feel confident? Drill yourself with a Flash Test. The game is speeded up, so think fast. Your answers are tallied up at the end for a final score.

Roll Call USA, a game of USA trivia for team or individual play. For Commodore 64. New from Creative Software.

\$14.95

Call and order today! Use your Visa, MasterCard or personal check. Toll Free **1-800-331-7990** (outside California), **1-800-448-1001** (in California), or **1-408-745-1655**. **MONEY BACK GUARANTEE.** If not completely satisfied, return within 10 days for full refund.

"Commodore 64" is a trademark of Commodore Electronics, Ltd.

C R E A T I V E S O F T W A R E

230 East Caribbean Drive, Sunnyvale, CA 94089

© 1984 Creative Software

FEATURES

What If...? The Popularity Of Strategy Games <i>Selby Bateman</i>	23	*
Electronic Trivia <i>Kathy Yakal</i>	37	*
Inside View: Byron Preiss and Ronald Martinez, Trillium Software Designers <i>Sharon Darling</i>	52	*
GAZETTE Telecommunications Software, Part 2: C/G Bulletin Board System <i>Robert Sims</i>	118	64

REVIEWS

Microflifer <i>Charles Brannon</i>	74	64
NATO Commander <i>Art Hunkins</i>	78	64
Road To Moscow <i>Neil Randall</i>	80	64
Also Worth Noting	84	64

GAMES

Cosmic Combat <i>Tommy Graham</i>	92	V/64
3-D Labyrinth <i>John Stilwell</i>	96	V/64

EDUCATION/HOME APPLICATIONS

Computing For Families: An Adventure In Telecommunications <i>Fred D'Ignazio</i>	60	*
Word Guess <i>David W. Rose</i>	66	V/64
Letter Attack <i>Craig Howarth</i>	70	V/64
Programming Commodore's Magic Voice <i>Betsy And Danny Byrne</i>	88	64

PROGRAMMING

BASIC Magic: A Christmas Assortment <i>Michael S. Tomczyk</i>	100	V/64
Machine Language For Beginners: Customizing <i>Richard Mansfield</i>	108	V/64
Hints & Tips: The Keyboard Funnel <i>Anthony James Daly</i>	114	V/64
Auto Line <i>Don Gibson</i>	130	V/64
Power BASIC: Time Clock <i>David W. Martin</i>	158	V/64
Cassette Index <i>Paul N. Peasley</i>	161	V/64
Disk/Tape Backup <i>N. A. Marshall</i>	164	V/64

DEPARTMENTS

The Editor's Notes <i>Robert Lock</i>	6	*
Gazette Feedback <i>Editors And Readers</i>	10	V/64
Simple Answers To Common Questions <i>Tom R. Halfhill</i>	48	V/64
Horizons: 64 <i>Charles Brannon</i>	136	64
User Group Update	142	*
VICreations: Key Memory Locations <i>Dan Carmichael</i>	154	V
News & Products	169	*

PROGRAM LISTINGS

A Beginner's Guide To Typing In Programs	172	*
How To Type In COMPUTE!'s Gazette Programs	173	*
The Automatic Proofreader	174	V/64
MLX	175	64
Bug-Swatter	176	V/64
Program Listings	177	V/64
Product Mart	226	*
Advertisers Index	228	*

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

COMPUTE!'s GAZETTE is published monthly by COMPUTE! Publications, Inc., Post Office Box 5406, Greensboro, NC 27403 USA. Phone (919)275-9809. Editorial offices are located at 324 West Wendover Avenue, Greensboro, NC 27408. Domestic subscriptions: 12 issues, \$24. Send subscription orders or change of address (P.O. Form 3579) to Circulation Dept., COMPUTE!'s GAZETTE, P.O. Box 961, Farmingdale, NY 11737. Second class application pending at Greensboro, NC 27403 and additional mailing offices. Entire contents copyright © 1984 by COMPUTE! Publications, Inc. All rights reserved. ISSN 0737-3716.

COMPUTE! Publications, Inc., One of the ABC Publishing Companies: ABC Publishing, President, Robert G. Burton; 1330 Avenue of the Americas; New York, New York 10019.

EXTRA

THE EDITOR'S

notes

GAZETTE Editor Lance Elko summarizes recent events at Commodore and looks forward to a new year here at the GAZETTE in this guest editorial.

Robert Lock, Editor In Chief

In early October, Commodore held a press conference to officially announce the kickoff of the Plus/4 and 16. Unofficially, however, not everyone at Commodore is excited about the prospects of the new machines. One source reported that there is a significant number of key employees who "just aren't behind the new computers."

Another staff member noted that some Commodore people are looking past the Plus/4 and 16 to the new Amiga (see last month's Editor's Notes), which could be on the market by early Spring. Although the Plus/4 and 16 have some advantages over the 64 and VIC, they're not technological breakthroughs. Good programming and utility machines, maybe, but not significantly different from the immensely successful VIC and 64.

Still, Commodore is proceeding with a major marketing campaign for the Plus/4 with ads in national magazines and major prime-time TV spots. It's doubtful that Commodore can repeat fiscal 1984's whopping sales figures with just the addition of the Plus/4 and the 16. Commodore's 1984 Annual Re-

port shows net sales of \$1.267 billion, almost double 1983's \$681 million.

Apparently, Commodore isn't relying completely on these two new machines to carry them through the year. Aside from the Amiga, there may be other entries in the wings. Sig Hartmann, President of Commodore's Software Division, noted at the press conference that Commodore is planning to show the C-128 (128K) computer for the home market at January's CES. He also stated that, in addition to the Amiga, an "80-column machine is coming out very, very shortly," and this, too, will be demonstrated at CES. No other details were offered, but Hartmann added that Commodore is now aiming to compete at every level in the microcomputer marketplace.

It will be interesting to see if the Plus/4 and 16 outsell the 64 this Christmas. Hartmann sees this as a possibility, but adds "the 64 is our mainstay machine. The Plus/4 is a productivity machine. It's the next level of the marketplace...for different groups of people." Commodore plans full software support for the Plus/4 and 16, and indicates a growing interest from third-party software developers. At its introduction, 26 packages were immediately available for both machines, and many more should be on the shelves as you read this.

Hartmann also noted that

Commodore has plenty of spare parts for VIC owners who don't wish to upgrade—"If people have a problem, we will fix it."

On another note, Commodore said that the previously announced Plus/4-compatible SFS 481 parallel disk drive will be released in January as the Commodore 1551, with a price tag that's \$60 to \$70 higher than the 1541. The 1551 is not compatible with the 64.

New Horizons

This issue marks the final appearance of our VICreations column by Dan Carmichael. Next month, Charles Brannon's Horizons:64 column will take on a new dimension. With a new title, simply *Horizons*, Charles will cover not only the 64, but also the VIC, the Plus/4, and the 16.

Thanks to you, the GAZETTE has continued as the leading magazine for Commodore users. Our paid circulation of 200,000 in January 1984 has grown to well over 300,000 with this, our final issue of the year.

In the next 12 months, we plan to continue offering the best articles, reviews, and programs for Commodore users, and we promise to stay innovative. We appreciate your support in 1984 and look forward to an even better year in '85. Happy Holidays.

Lance Elko
Editor

Publisher Gary R. Ingersoll
Editor in Chief Robert C. Lock
Director of Administration Alice S. Wolfe
Senior Editor Richard Mansfield
Managing Editor Kathleen Martinek
Editor Lance Elko
Assistant Editor Todd Heimark
Production Director Tony Roberts

Editors

Tom R. Halfhill, Editor, COMPUTE! Magazine; Stephen Levy, Editor, COMPUTE! Books Division; Gail Walker, Production Editor; Otis R. Cowper, Technical Editor; Charles Brannon, Program Editor; Selby Bateman, Features Editor

Assistant Editors

Gregg Keizer, J. Blake Lambert (Books); John Krause, George Miller, Philip Nelson (Technical); Kathy Yakal, Feature Writer; Sharon Darling, Research Assistant (Features), Randall Fosner, Assistant Managing Editor (Books); Mark Tuttle, Submissions Reviewer

Editorial Programmers

Patrick Parrish (Supervisor), Gregg Peele (Assistant), Tim Victor, Kevin Mykityn, Gary Black, Kevin Martin, Rob Terrell

Programming Assistants

David Florance, Susan Doss, David Hensley

Copy Editors

Juanita Lewis, Joan Rouleau, Ann Davies

Proofreaders

Ethel Silver, Dwight Smith, Marty Selby

Administrative Staff

Vicki Jennings, Laura MacFadden, Julia Fleming, Susan Young, Iris Brooks, Jan Kretlow

Production

Irma Swain, Production Manager; Janice Fary, Art & Design Director, Lee Noel, Assistant Editor, Art & Design; De Potter, Mechanical Art Supervisor; Terry Cash, Carole Dunton, Typesetting

Artists

Leslie Jessup, Larry Sullivan, (Publications), Debbie Bray (Books); Harry Blair, Illustrator

Associate Editors

Jim Butterfield (Toronto), Harvey Herman (Greensboro), Fred D'Ignazio (Roanoke)

Circulation

Charles C. Post, Circulation Manager; Patty Jones, Assistant Circulation Manager; Fran Lyons, Single Copy Sales Supervisor

Customer Service

Philippa King, Customer Service Manager; Gail Jones, Dealer Sales Supervisor; Dorothy Bogan, Customer Service Supervisor; Dealer Sales Staff: Sharon Minor, Rhonda Savage; Customer Service Staff: Betty Atkins, Gayle Benbow, Rosemarie Davis, Debi Goforth, Chris Gordon, Mary Hunt, Liz Krusenstjerna, Jenna Nash, Chris Patty, Anita Roop, Sharon Sebastian, Judy Taylor

Jim Coward, Warehouse Manager; Staff: John Archibald, Jack McConnell, Larry O'Connor, Sam Parker, Dai Rees, Eddie Rice, Eric Staley; Mary Sprague, Mail Room Coordinator.

Data Processing

Leon Stokes, Manager; Chris Cain, Assistant

Accounting

Paul J. Megliola, VP, Finance & Planning; R. Steven Vetter, Director, Finance & Planning; Robert Bean, General Accountant; Karen K. Rogalski, Financial Analyst; Staff: Jane King, Jill Pope, Shannon Roessler

Credit

Barry L. Beck, Credit Manager; Staff: Sybil Agee, Susan Booth, Anne Ferguson, Pat Fuller, Doris Hall, Linda Miller, Mary Waddell

Purchasing

Gregory L. Smith, Purchasing Manager; Anna Harris, Assistant

Promotion

Mindy K. Kutchei, Promotion Manager; Caroline Dark, Assistant

Advertising Sales

Ken Woodard, Director of Advertising Sales; Bonnie Valentino, Assistant Advertising Manager; Patti Williams, Production Coordinator; Joyce Margo, Production Assistant; Kathleen Hanlon, Sales Assistant

Sales Representatives

Jerry Thompson 415-348-8222
Phoebe Thompson 408-354-5553
Ed Winchell 213-378-8361
Harry Blair 919-275-9809

Jules E. Thompson, Inc.
National and Canadian Sales Representatives
1290 Howard Avenue, Suite 303
Burlingame, CA 94010

Address all advertising materials to:
Patti Williams, COMPUTE!'s GAZETTE
324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Sales Offices, The Thompson Company

New England 617-720-1888
Mid-Atlantic 212-772-0933
Southeast 919-275-9809
Midwest 312-726-6047
Texas 713-731-2605
Northwest, Nevada 408-354-5553
Northern CA 415-348-8222 or 408-354-5553
Southern CA 213-378-8361
Arizona 213-378-8361
New Mexico 213-378-8361
Colorado 303-595-9299

COMPUTE! Publications, Inc., publishes

COMPUTE! COMPUTE! Books COMPUTE!'s GAZETTE

Corporate Office:

324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Mailing Address:

Post Office Box 5406, Greensboro, NC 27403

Distribution Center

505 Edwardia Drive, Greensboro, NC 27409

Telephone: 919-275-9809

Office Hours: 8:30 AM to 4:30 PM Monday-Friday

Chief Executive Officer Robert C. Lock

President Gary R. Ingersoll

Vice President, Finance & Planning Paul J. Megliola

Executive Assistant Debi Nash

Assistant Cassandra Robinson

Subscription Information

COMPUTE!'s GAZETTE Circulation Dept.
P.O. Box 5406, Greensboro, NC 27403

TOLL FREE
Subscription Order Line
800-334-0868
In NC 919-275-9809

COMPUTE!'s GAZETTE
Subscription Rates

(12 Issue Year): US (one year) \$24. Canada, Mexico and Foreign Surface Mail \$30. Foreign Air Mail \$45.

The COMPUTE!'s GAZETTE subscriber list is made available to carefully screened organizations with a product or service which may be of interest to our readers. If you prefer not to receive such mailings, please send an exact copy of your subscription label to: COMPUTE!'s GAZETTE, P.O. Box 961, Farmingdale, NY 11737. Include a note indicating your preference to receive only your subscription.

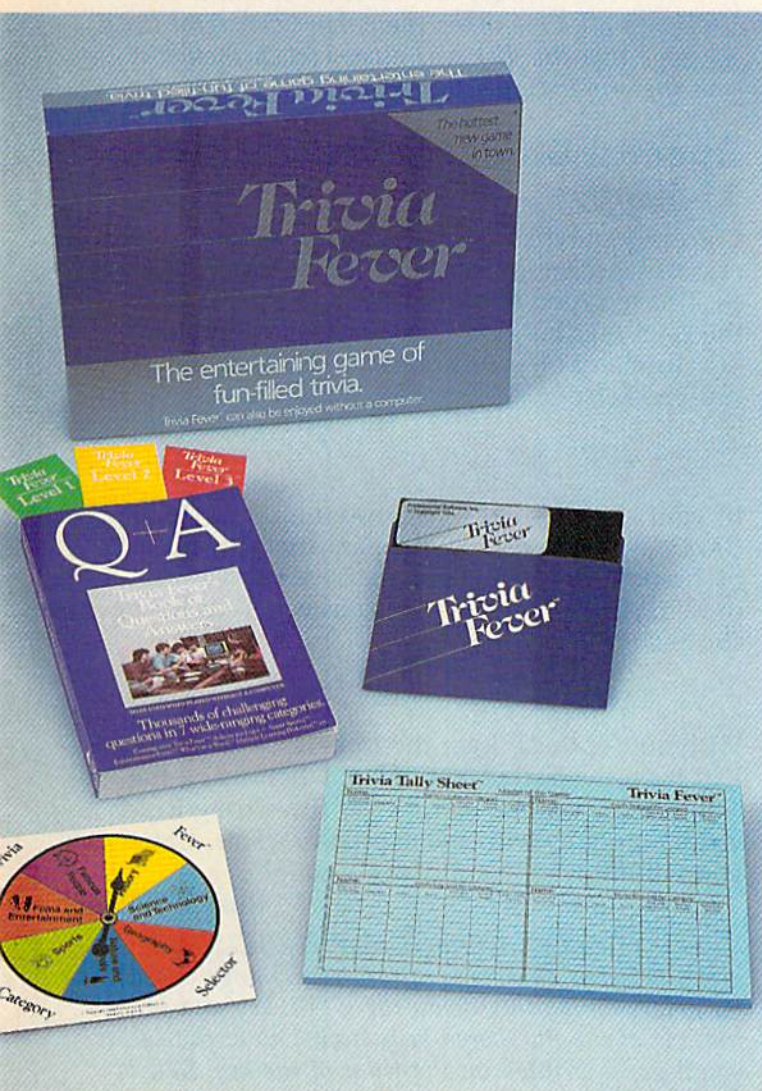
Authors of manuscripts warrant that all materials submitted to COMPUTE!'s GAZETTE are original materials with full ownership rights resident in said authors. By submitting articles to COMPUTE!'s GAZETTE, authors acknowledge that such materials, upon acceptance for publication, become the exclusive property of COMPUTE! Publications, Inc. No portion of this magazine may be reproduced in any form without written permission from the publisher. Entire contents copyright © 1984, COMPUTE! Publications, Inc. Rights to programs developed and submitted by authors are explained in our author contract. Unsolicited materials not accepted for publication will be returned if author provides a self-addressed, stamped envelope. Where programs are included in an article submission, a tape or disk must accompany the submission. Printed listings are optional, but helpful. Articles should be furnished as typed copy (upper and lowercase, please) with double spacing. Each article page should bear the title of the article, date, and name of the author. COMPUTE! Publications, Inc., assumes no liability for errors in articles or advertisements. Opinions expressed by authors are not necessarily those of COMPUTE! Publications, Inc. COMPUTE! Publications assumes no responsibility for damages, delays, or failure of shipment in connection with authors' offer to make tape or disk copies of programs published herein.

PET, CBM, VIC-20, and Commodore 64 are trademarks of Commodore Business Machines, Inc., and/or Commodore Electronics Limited. Other than as an independent supplier of quality information and services to owners and users of Commodore products, COMPUTE! Publications, Inc., is in no way associated with Commodore Business Machines, Inc., or any of its subsidiaries.

Catch

Trivia Fever™

**"The Hottest
New Game In Town"**



Trivia Fever is absolutely unique — it's the only software entertainment package that can be enjoyed **with** or **without** a home computer! When played on your home computer, Trivia Fever is a refreshing alternative to all those shoot'em up games. An elected "Master of the Game" uses the computer to randomly select subject categories, handicap players, generate questions and answers, keep score automatically, and more! Instructive by its very nature, Trivia Fever can be enjoyed by up to 8 individuals or teams. And when played without a computer, Trivia Fever has all the best features of the "popular" trivia games plus more — all without the cumbersome board, cards, and little game pieces. You can play in a car, on vacation, anytime, anywhere! And Trivia Fever is by far the best Trivia game available anywhere. Here's why:

Trivia Fever offers thousands of challenging questions in 7 interesting categories, so there's something for everyone. Each category has questions with 3 levels of difficulty, which score comparable points. What's more, Trivia Fever allows players to HANDICAP all those so-called "trivia experts" three different ways, giving everyone a chance to win. And players can easily control the length of play from quick thirty minute games to multi-hour party marathons!



Trivia Fever is unique, entertaining, educational, and most of all FUN. And at \$39.95, Trivia Fever is destined to quickly become the best selling software entertainment package of all time. There's even a \$5 rebate available to any non-computer users who return the computer diskette.

Trivia Fever can be enjoyed on the Commodore 64, IBM PC & PCjr and compatibles, Apple II series, and others. So don't delay. Catch Trivia Fever at your favorite software retailer today!

For additional information call 617-444-5224, or write to:

At \$39.95, Trivia Fever comes complete with Question and Answer Book, Category Selector, and Tally Sheets to be used when played without a computer.

PSI P.O. Box 533
Needham, MA 02194
Trivia Fever is a trademark of Professional Software, Inc.

GAZETTE FEEDBACK

EDITORS AND READERS

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

Note To Readers

In the October issue, page 132, we incorrectly listed the phone number of the Modem Times. The correct number is (303) 578-5405.

An End To Disk Drive Chatter

When loading commercial software, the disk drive often makes a loud chattering noise while reading the program. This is usually caused by a copy protection technique used by software distributors, whereby the disk drive is forced to read a bad track or sector on the disk.

Over a period of time, this repeated vibration of the drive's read/write head could damage the drive, or cause the stepper motor assembly which positions the read/write head to slip out of adjustment.

Here is a short program that, in most cases, will prevent this chatter when loading commercial programs. It will prevent the head from bumping when going to track one.

Type the following one line program in the immediate mode (without a BASIC line number) and press RETURN. It will reprogram the disk controller, and should be entered just before loading the commercial software. After it is entered, load the software according to the directions. This program is about 90% effective, but in cases where it does not stop the chattering, it shouldn't interfere with the proper execution of the commercial program. Try it, and your 1541 will thank you.

```
OPEN 15,8,15:PRINT#15,"M-W";
CHR$(106)CHR$(0)CHR$(1)CHR$(133):CLOSE15
```

Gilbert D. Helland

Thanks for the very useful tip. Many readers have written and inquired about the possibility of damage to their disk drives when this "chattering" is encountered. We tested this program on software from five different software manufacturers, and it worked well with all. One other game, however, returned a message that the disk was a copy (even though it was the original).

Special Brackets And GAZETTE Listings

I recently purchased a VIC-20 and am in the process of teaching myself how to program. In doing so, I have typed in some of the programs from the GAZETTE, but have encountered a problem.

In many of your programs you use the special brackets:

In your section "How To Type In COMPUTE!'s GAZETTE Programs," you explain that this is done by holding down the Commodore key while pressing the key inside the brackets. Your listing shows:

```
⌈⌋  ⌈ 8 ⌋  ⌈⌋
```

With any of these I get the uppercase as though I had used the SHIFT key. Also, when using the "Automatic Proofreader," I get the wrong REM values on lines with the special brackets. Can you tell me what I am doing wrong?

Russell Willis

You aren't doing anything wrong. A VIC-20 has eight different character colors. You change character colors by holding down the CTRL key and pressing one of the numbered keys from 1 to 8; the color you'll get is printed on the front of the key. BLK is black, WHT is white, and so on.

If you're in quote mode, however, pressing

Net Worth™

Your Personal

**Its only business is managing your home finances.
No program does it more quickly, more easily, more directly.**

Your Personal Net Worth systematizes the management of your household income, expenses, credit cards and check books — using methods tested for accuracy by Touche Ross, one of the nation's leading accounting firms.

Your Personal Net Worth puts your computer to work, keeps your records straight, including your personal inventory of valuables and stock portfolio, tells you where and how you're spending your money or if you're making a shambles of your budget. And does it all

in less time than it takes you to balance your check book.

Nothing else — no other program at twice the price — makes handling your personal money matters simpler, faster and more direct than **Your Personal Net Worth**.

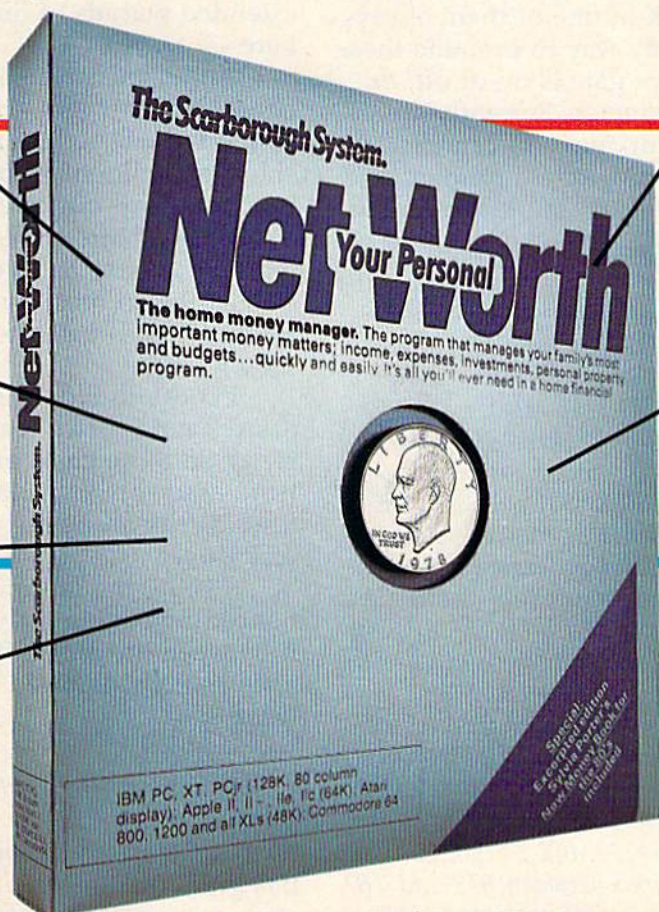
You'll find it at your favorite software retailer in the silver box with the real silver dollar on the front. It could be the single most valuable purchase you'll ever make.

Record all banking and any credit card transactions, reconcile bank statements instantly (up to 10 separate bank accounts can be handled), — print checks, too.

Set up a budget (as many as 350 categories) — and then compare your actual income and expenses to the budget.

Never forget a tax-deductible item. Today or at tax return time.

Display or print every financial report you'll ever need.



Record stock, bond and other investment transactions. Inventory household valuables, collectibles and important papers for insurance and other purposes.

Your Personal Net Worth works fast because it's in machine language. Documentation in plain English is referenced for easy use. "Help" functions on screen at all times.

Available for:

IBM-PC/XT/PCjr (128K)
Apple II + /IIe/IIc (64K)
Commodore 64
Atari (48K)
The Program comes with two disks, one of which has accounts already set up for entry. However, only one disk drive is necessary.

The Scarborough System.

You'll grow with us.

CTRL and a color key will result in a graphics character. This is useful when you want to change colors in the middle of a string.

When Commodore developed the 64, the designers decided to add eight more character colors, for a total of 16. Among the new colors are a brown, a light blue, and three shades of gray. The new colors are accessed by holding down the Commodore logo key and typing one of the numbers between 1 and 8. The eight colors which use the Commodore key on the 64 are not available on the VIC, which treats a Commodore-8 the same as a SHIFT-8 and prints a left parenthesis.

In one case, "3-D Tic-Tac-Toe" (June), a GAZETTE program originally written for the 64 was translated for the VIC and some of the inaccessible color codes were left in the listing. The solution is to omit the character altogether, or use the CTRL alternative. Either way, the Proofreader checksum will not match up.

PEEKless SID Registers

I'd like to examine the SID (Sound Interface Device) registers in my 64 while my music program is playing. However, the SID registers are *write only registers*, and a PEEK at one of them always returns a zero. Is there any way to examine these registers to see if the voice gate is on or off, or what any of the SID parameters currently are? My program is interrupt driven, so I can check these registers while the program is running.

Mark Wardenburg

Unfortunately, there is no way to PEEK these registers and get an accurate value. The chip that runs your 64 treats the SID registers as if they occupy memory locations, but a POKE to the SID chip actually sends a one-way electrical signal to certain pins. Trying to PEEK the SID chip registers is like trying to get water to run uphill through a hydroelectric dam. On some 64s a value other than zero might be returned with a PEEK, but they may be random values, and should not be trusted.

However, there is a useful programming technique that will allow you to monitor the values you have POKEd into the SID registers. The 25 SID registers most frequently used to produce sound are the memory locations between 54272 and 54296.

First, set aside 25 bytes in an unused area of memory. Two possibilities are the cassette buffer (828-1019), or the unused area of memory between 679 and 767. These 25 bytes will correspond to the 25 SID registers between 54272 and 54296. For example, when using the area between 679 and 767, byte 679 would correspond to SID register 54272, and 703 to 54296. There is also 4K of available RAM starting at 49152.

In your program, first POKE the values you wish to place in the SID registers into the

corresponding memory location in the reserved area. Then move the value from this memory location into the SID chip. Use a loop (in BASIC or ML) to PEEK the value in memory and POKE the value to the SID chip. You still can't PEEK the SID chip, but you can PEEK its mirror image.

All of the SID registers except two are write-only—you can POKE but not PEEK. Your POKEs provide the input which triggers the chip to output sounds to a television or monitor speaker. The two unusual locations are at 54299 and 54300, and like ROM, are read-only. The first of these, 54299, reads the upper eight bits of the waveform output of oscillator three. This is very handy for machine language programmers who need random numbers. At the beginning of an ML program, set voice three to a white noise waveform with the highest possible frequency and an envelope of zero attack, zero decay, maximum sustain. Any time you need a random number, Load the Accumulator (LDA) from location 54299 (\$D41B). The result is an (almost) random number from 0 to 255.

Cool Disk Drives

If you leave your 1540 or 1541 disk drive on for extended periods of time, causing it to heat up, here's a tip.

An inexpensive air purifier placed upside down over the vent grills on the top-rear of the disk drive will reduce the temperatures of the chips, and eliminate the hot spots felt when leaving your drive on for extended periods of time.

I use a Norelco model HBO999 because of its compact size and horizontal outlet. I have removed the scented crystals leaving the wire mesh to act as a coarse filter, thus increasing air flow.

I chose to blow air into the drive rather than draw it out for two reasons. First, it forces air directly onto the chips and out past the read/write head assembly. Second, it provides the option of filtering the air before it is introduced into the disk drive.

Sealing the fan unit to the drive can be enhanced by cutting out a foam gasket and placing it between the air purifier and the drive. Appearance can be enhanced by removing the purifier's legs.

Gerry Bamon

Thanks for the tip. Most of the cooling fans advertised for the 1540 or 1541 work on this principle. That is, they are flat fans laid on top of the ventilation grills. You might also place a piece of lintless cloth over one end of the air purifier.

Be sure to remove the filters made of citrus, charcoal, or any other filtering agent of this type. Any particles falling into the disk drive could cause damage.

WordPro 3 Plus™/64

The #1 Selling Word Processor for the Commodore 64™

Now Includes

SpellRight Plus!

Spell Checking Program



WordPro 3 Plus™/64 and SpellRight Plus™ provide a total word processing solution for the Commodore 64™ which gives you:

- ★ Sophisticated Word Processing
- ★ Built-in Mail Merging for Form Letters
- ★ Math Functions for Column Totals
- ★ Fast and Complete Spell Checking via SpellRight Plus
- ★ A Super Value (two programs) for Only \$99.95!

WordPro and SpellRight are both specifically designed for the novice user with no computer or word processing experience whatsoever. And with over 40,000 WordPro versions sold, you can be sure that WordPro is a very sophisticated word processor loaded with powerful features including: Transfer, Insert, Delete, and Rearrange Text, Auto Page Numbering, Math Functions, Headers, Footers, Global Search and Replace, the Ability to Create Multiple Personalized Letters and Documents, and much more. WordPro can create documents of virtually any length and will print up to 165 columns wide. You get all of this PLUS fast and complete spell checking using SpellRight Plus!

SpellRight Plus locates and highlights misspelled words and then allows you to quickly correct the misspellings — improving the quality of your letters and reports.

And, best of all, WordPro and SpellRight's powerful arsenal of features can be put to use almost immediately — by even the novice user. So whether you're a student, professional writer, in business, education or a hobbyist, you'll quickly become a WordPro Pro!

Both WordPro and SpellRight Plus are also available separately at popular computer outlets nationwide.

Invest in the best... WordPro Plus. In a class by itself.

Professional Software Inc.

51 Fremont Street
Needham, MA 02194

(617) 444-5224
Telex: 951579

Dealer and Distributor inquiries are invited.

WordPro 3 Plus™/64 and SpellRight Plus™ are trademarks of Professional Software Inc.

The WordPro Plus Series was designed and written by Steve Punter of Pro-Micro Software Ltd.

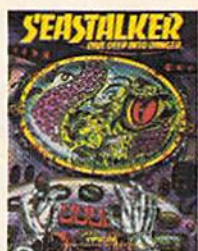
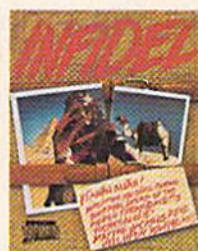
SpellRight Plus was designed and written by Dwight Huff and Joe Spatafora of SpellMaster Systems, Inc.

Some printers may not support certain WordPro 3 Plus functions and/or require an interface. Please check with your dealer.

Commodore 64™ is a trademark of Commodore Electronics Ltd.



Professional Software Inc.
74 Lincoln Street
Westport, MA 02157
(617) 441-1555
Fax: (617) 441-1556



AND NOW FOR SOMETHING INCOMPLETELY DIFFERENT!

Incomplete, yes. But it's not just because we're always bringing out new stories in the Infocom interactive fiction collection. Nor is it simply due to the fact that with all the writing and re-writing, honing and perfecting that we put into every one of our stories, our work is seemingly never done.

The real reason is: an Infocom work of fiction can never be complete until you become a part of it.

You see, as hard as we work at perfecting our stories, we always leave out one essential element—the main character. And that's where you enter in.

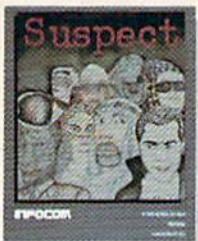
Once you've got Infocom's interactive fiction in your computer, you experience something akin to waking up inside a novel. You find yourself at the center of an exciting plot that continually challenges you



In **CUTTHROATS**™ the plot involves a motley band of hardbitten salts who get wind of a shipwreck laden with sunken treasure near the remote island where you live. In exchange for your diving skills, they offer you a piece of the action. Your challenge: survive them, the perils of the deep, and escape with the treasure and your life. Good luck!



THE HITCHHIKER'S GUIDE TO THE GALAXY™ by Douglas Adams is the most mind-boggling story we've ever published. In the person of Arthur Dent, you'll chortle as your planet is demolished. You'll yelp with laughter as your life is threatened by a galaxy of horrors. Your sides will positively split as you search the universe for... well, you'll find out. Maybe.



In **SUSPECT**™ our newest mystery thriller, you're a reporter who gets the scoop on the society event of the year—the murder of a Maryland Blue Blood at a fancy costume ball. Great! Except you're the prime suspect. And if you can't find the real killer, your next by-line could be in the obituaries.

with surprising twists, unique characters (many of whom possess extraordinarily developed personalities), and original, logical, often hilarious puzzles. Communication is carried on in the same way as it is in a novel—in prose. And interaction is easy—you type in full English sentences.

But there is this key difference between our tales and conventional novels: Infocom's interactive fiction is active, not passive. The course of events is shaped by the actions you choose to take. And you enjoy enormous freedom in your choice of actions—

you have hundreds, even thousands of alternatives at every step. In fact, an Infocom interactive story is roughly the length of a short novel in content, but because you're actively engaged in the plot, your adventure can last for weeks and months.

In other words, only you can complete the works of Infocom, Inc. Because they're stories that grow out of your imagination.

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

INFOCOM™

Infocom, Inc., 55 Wheeler Street, Cambridge, MA 02138

For you: Apple II, Atari, Commodore 64, CP/M8*, DECmate, DEC Rainbow, DEC RT-11, IBM PC* and PCjr, KAYPRO II, MS-DOS 2.0* NEC APC, NEC PC-8000, Osborne, Tandy 2000, TI Professional, TI 99/4A, TRS-80 Models I and III.

*Use the IBM PC version for your Compaq, and the MS-DOS 2.0 version for your Wang or Mindset.

CUTTHROATS and SUSPECT are trademarks of Infocom, Inc. THE HITCHHIKER'S GUIDE TO THE GALAXY is a trademark of Douglas Adams.

Oversized Variables

In many of your programs for the VIC and 64, I have seen statements such as:

```
FOR ADRES = 123
```

What is ADRES?. I thought variables in a program were limited to two characters.

Tim Cronsberry

When programming in BASIC, you are limited to two significant characters. You can give your variable names more than two characters, but anything after the first two will be ignored by the operating system.

Using names with more than the allowable number of characters can be beneficial because it makes the program more readable. The variables used can be understood more easily.

But you must remember that only the first two characters have any significance. For example, when writing a payroll program, a variable name of HOURLYWAGE would make the listing easier to follow. However, if you have another variable in the same program with the same first two letters (HOURSTOTAL, for example), the computer would treat them as if they were the same variable, HO, and you would not get the desired results. In addition, you must watch for embedded BASIC keywords. For example, the keyword TO (as in FORJ=1TO10), if used in a variable such as TOTALHRS, is embedded and will cause a syntax error.

If you do use variable or string names with more than two characters, make sure the first two characters are unique.

Spinning The Disk Drive

In the June 1984 issue, Jerry A. Coy had a question about spinning the disk while cleaning the disk drive. Here's a short program I wrote to help me clean my disk drive. It will move the read/write head back and forth from track 1 to track 35. This will maximize the potential of your cleaning disk, and provide a back and forth cleaning motion as well as that of the motor spinning.

If you have a drive with an address other than 8, change line 5 to U (= your drive number). To change how long the program runs, vary the loop in line 20 (each pass through takes about 10 seconds).

To use it, load the program, prepare the cleaning disk per the manufacturer's instructions, insert the cleaning disk into the drive, and enter RUN.

```
5 U=8
10 OPEN 15,U,15
15 OPEN2,U,2,"#"
20 FOR J=1TO4
30 PRINT#15,"U1:2 0 1 1"
```

```
40 PRINT#15,"U1:2 0 35 1"
50 NEXT J
60 INPUT#15,A$,A$,A$,A$,A$
70 CLOSE2:CLOSE15
```

Random Number Ranges

I have a question about generating random numbers on my 64. How can I make my computer generate random numbers between 100 and 200 by steps of 5?

David Tan

There are a number of different ways to generate a range of random numbers in steps. Here are the two most straightforward.

The range of numbers you need (100-200) contains 21 different unique numbers. If you generate a random number between 0 and 20 (this covers the range of 21), multiply it by 5 (producing the steps by 5) and add it to 100 (which gives you the low base of 100), you will get the desired results. Here's a sample program to show how it's done.

```
10 A=INT(RND(1)*21)+0
20 A=A*5+100
30 PRINTA:GOTO10
```

Another method is to generate a random number between 100 and 200 then check to see if it is one of the desired numbers. This can be done with a FOR-NEXT loop that is incremented by steps of five. Here's how it works. Generate a random number within your range of 100-200, then via the FOR-NEXT loop check to see if it is equal to 100. If not, increment your loop by five and check to see if the number is equal to 105 and so forth up to 200. If no equal condition is found, generate another random number and start the process again. This method is much slower than the first example. Here's a sample program.

```
10 A=INT(RND(1)*101)+100
20 FORB=100TO200STEP5:IFA=BTHENPRINTA:GOTO10
30 NEXT
50 GOTO10
```

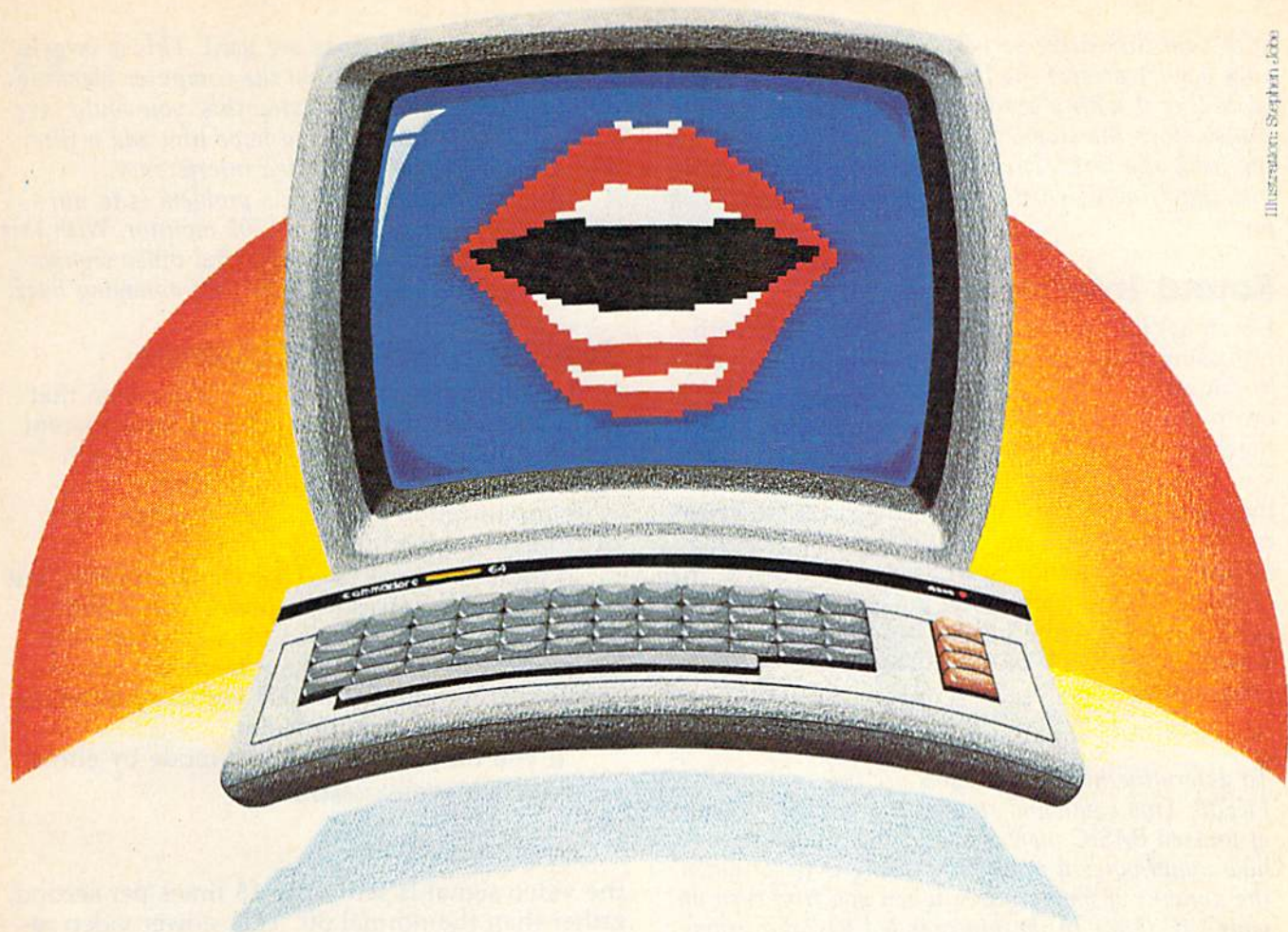
Bad Vibrations

When I purchased my 1541 disk drive, it came with a card inserted into the drive that said Head Vibration Protector. The instructions on the card stated that it should be inserted into the disk drive and the door closed each time the disk drive is moved.

Well, I have my computer and disk drive on a table that rolls so I can pull it out when in use, and push it back when I'm done. Even though I frequently move the table back and forth, should I keep the card inserted into the drive as instructed? Will it harm the read/write head if I don't?

Steve Trigili

The cardboard head protector that came inserted



Not just all talk.

Add Speech to your Commodore 64™ today!

With the POWER of **The Voice Messenger's™** infinite vocabulary, your Commodore 64 can say any letter, word or sentence. Simply!

Just for fun...or as an educational tool.

Best of all, it's simple to program your C-64 to leave all sorts of talking messages.

Just think of the possibilities!

A message to your family! A secret for your best friend! Or even a reminder for yourself to feed the fish!

The Voice Messenger features: ■ Infinite vocabulary
■ One BASIC command "SAY" provides easy pro-

gramming of whole sentences ■ Two voices and intonation—add character and excitement ■ Built-in software—nothing extra to buy ■ Installs instantly—Two simple connections ■ Clear, easy to understand speech ■ Doesn't steal RAM from BASIC workspace ■ Won't stop screen action.

Add new life to your Commodore 64 with **The Voice Messenger!** Ask for **The Voice Messenger** at your local Commodore dealer, or call TOLL-FREE 1-800-443-0100 ext. 797 to place your order now!

The Voice Messenger-Speech 64

For more information contact:



50 Milk St. 15th floor, Boston, MA 02109 (617) 357-8084 TELEX: 061131 HQ BSN
Currah Computer Components Ltd. Reg. No. 1666490, U.K. Graythorp Industrial Estate, Hartlepool, Cleveland, U.K. Telex 68127 CURRAH G
Commodore 64 is a trademark of Commodore Electronics Ltd.

with your disk drive serves a dual purpose. Not only does it protect the head during shipment by providing it with a semi-soft surface to rest on, but it also stops the stepper motor assembly from moving back and forth. It can't hurt to insert the card into the drive whenever it is moved, no matter how far.

Sound Interference

I own a VIC-20 and have discovered that without using expansion memory, there isn't much [memory] to work with. Is there a way to find out how many bytes I have used, or how much memory is left?

In another area, I've noticed that a few of the games I've typed in from the GAZETTE cause buzzing sounds on my TV. In fact, the buzzing is so loud at times that I can't hear the beep of the characters. One such game is "React." It doesn't buzz until the white border is added to the black screen. Is it my TV or my all-thumbs programming?

Thomas Putt

To determine how many bytes are free, enter PRINT FRE(0). This command returns the number of bytes of unused BASIC memory. One way to determine how many bytes a program is using is to jot down the amount of memory free when you first turn on your VIC (3581 in the unexpanded VIC, for example). After loading or writing your program, enter PRINT FRE(0) and subtract the resulting number from the original bytes free. This will tell you the number of bytes used by your BASIC program.

In addition to BASIC programs, variables use memory. If you ask for the amount of free memory before and after running a program, you will probably find you have less when the program has finished. This is why it's possible to run out of memory halfway through a program. There are numerous techniques for saving memory. Deleting all REMark statements is probably the most common. Since each BASIC line takes up a minimum of five bytes, putting more than one statement on each line can open up some memory. And if you're using numeric arrays which hold whole numbers, use integer arrays (P%(5)) rather than P(5), for example. Integer arrays use only two bytes per item compared to five bytes for floating point arrays. Unfortunately, this does not hold true for non-array variables; both integer variables and regular floating point variables take up five bytes (plus two for the variable name).

One solution to your buzzing problem is to adjust the fine tuning on your television (most TVs have a ring around the channel selector). Or try flipping the switch on the RF modulator which selects between channel three and channel four.

Some TVs will produce a buzzing sound when

certain color combinations are used. This is largely due to the video signal from the computer bleeding into the audio channel. To stop this, you could take your TV to a technician, and have him add a filter which might remove the video interference.

Another way to solve this problem is to purchase a Commodore 1701 or 1702 monitor. With this monitor, you can feed the audio and video signals separately. This helps eliminate that annoying buzz.

Jumping Screens Update

In the July issue, you dealt with a problem that many of us VIC users face. That is the apparent incompatibility of the VIC-20 and the Zenith System III TVs. You mentioned a minor hardware modification for the TV that would solve the jumping screen problem.

I initially experienced the same problem, but found a simple software solution. The jumping screen is apparently caused by a problem with the vertical sync, but it is not necessary, as you mentioned, to unplug the 2H vertical jumper, as suggested by the Zenith dealer.

If you turn on the interlace mode by either:

POKE 36864,PEEK(36864)OR 128

or

POKE 36864,133

the video signal is sent only 15 times per second, rather than the normal 30. This slower video refresh enables the vertical sync to function properly.

Dr. Philip C. Withers

Thanks for the helpful tip, Dr. Withers. Readers should note that it is bit 7 (value of 128) which controls the interlace switch. Bits 0-6 control the horizontal location of the screen. By POKEing different values to 36864, you can make the whole screen move back and forth. The next memory location, 36865, controls the vertical location. POKEing 36865 makes the screen move up and down. These two locations can be helpful in centering the screen. Also, if you're writing a game, a series of quick POKes to these two locations can make the screen appear to "tremble," as if shaken by an explosion.

1520 Printer/Plotter Replacement Pens

As a recent purchaser of a Commodore 1520 Printer/Plotter, I have found that replacement pens are hard to find.

For interested readers, I suggest using the replacement pens for the Radio Shack PC-2 Printer/Plotter, catalog number 26-1480 (3 black pens), and catalog number 26-1481 (one each of red, blue, and green). The pens are identical to the Commodore pens.

Herbert H. Starkey



LAST NIGHT, 39 MUSICIANS HAD A COMPU SERVE CONFERENCE, SO DID 31 M.D.S, 49 SPORTS FANS AND 640 APPLE POLISHERS, AND NO ONE HAD TO LEAVE HOME.

The Electronic Forum, Cheaper than Long Distance and Much More Rewarding.

Every night on the CompuServe Information Service, professional and social groups discuss a wide range of subjects. From what's new in medical technology to what's nouvelle in continental cuisine.

And every day more computer owners who share a common interest are discovering this exciting new way to exchange ideas and even transfer hard copy data.

And besides electronic forums, they leave messages for each other on our national bulletin board, "talk" informally on our CB simulator, and communicate via CompuServe's electronic mail.

But best of all, in most cases, CompuServe subscribers get all of these state of the art communications options, plus a world of on-line information and entertainment for the cost of a local phone call plus connect time.

To become part of this flexible communications network, all you

need is a computer, a modem and CompuServe. CompuServe connects with almost any personal computer, terminal, or communicating word processor.

To buy a Starter Kit, see your nearest computer dealer. To receive our informative brochure or to order direct, call or write:

CompuServe

Consumer Information Service, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, OH 43220

800-848-8199

In Ohio call 614-457-0802

An H&R Block Company

Colorful Sprites

How do you give a sprite more than one color?

Scott Senkeresty

Sprites are a powerful programming tool, but with power comes complexity. You have to work out the shape, convert it to DATA statements, POKE them into a safe area of memory, set a pointer to the sprite shape, set X and Y coordinates, set the color, and turn on the sprite. There are a number of books and magazine articles which explain how to use sprites.

Multicolor sprites give you more flexibility, more interesting shapes to work with. If you've arrived at the point where you can define sprites and move them around the screen, you can begin to experiment with color. There are two ways to make multicolor sprites.

The first is fairly easy. Define two sprites, using different colors, and put one on top of the other. Sprites are displayed in a certain order of priority, from lowest number to highest. This means that sprite zero will always appear on top of (or in front of) all other sprites. Sprite one has priority over sprites two through seven, and so on.

Normally, if a bit is turned on, it will appear on the screen in the color of the sprite. An off bit

will let the background color show through. But if you have one sprite on top of another, the off bits will let the second sprite's color show through (the second sprite is the one with the lower priority). As long as they have the same X and Y location, it will appear that you have a single two-color sprite.

There are two drawbacks to this method, however. The first is that instead of eight one-color sprites, you are limited to four two-color sprites (or two four-color sprites). Second, if your program needs to check sprite collisions, you have to be careful that the bits of the overlapping sprites do not intersect. You may get spurious collisions if the program is written in BASIC.

A better way to make colorful sprites is to use multicolor mode, controlled by a register at 53276. The eight individual bits correspond to the eight different sprites. To make all sprites one color, POKE 53276,0. POKEing a 1 makes sprite 0 multicolor (and the rest one color); POKEing a 2 makes sprite 1 multicolor, up to 128 which affects sprite seven. POKE 53276,255 (255 is $128+64+32+16+8+4+2+1$) to make all of them multicolor.

Multicolor mode gives you up to 4 different colors in each sprite. The four colors are: screen color (actually a transparent part of the sprite allowing the background screen color to show through), individual sprite color, sprite multicolor 0, and sprite multicolor 1. The individual sprite color can vary from sprite to sprite, but screen color, and the two multicolors are the same for all eight sprites. The registers to POKE are as follows:

00 Screen color : 53281
10 Sprite color : 53287-53294 (sprites 0 through 7)
01 Multicolor 0 : 53285
11 Multicolor 1 : 53286

To turn on the multicolor mode for a single sprite, POKE 53276,PEEK(53276) OR (2^N N) where N = sprite number (0 to 7). To turn off the multicolor mode: POKE 53276,PEEK(53276) AND (255-2^N N).

Unlike the first method of adding color, multicolor mode lets you have eight different sprites moving around. But there is one drawback: Resolution is halved. Instead of coloring individual pixels, pairs of pixels are turned on or off. Let's say one of the DATA statements is 50, which translates to a bit pattern of 00110010. With one-color sprites, the 1's would represent pixels which are turned on. But in multicolor mode, you have to look at bit pairs: 00, 11, 00, and 10. The first two pixels (00) would be transparent, the same color as the screen. The next two (11) would be multicolor 1, followed by the screen color again. The last two (10) would both be the sprite color. Even though the two bits are different, 1 and 0, the corresponding pixels would be the same color. Instead of each byte controlling eight different pixels, each byte controls four different pairs of pixels. ☺

LOW COST SOFTWARE

Are you tired of paying high prices for your software?
Let John Henry Software save you money!

We distribute public domain software for your VIC 20™ or Commodore 64™. We've tested and documented each program to guarantee you hours of fun and useful learning experiences. We specialize in prompt delivery of your software, even if you order tapes, and we guarantee our product.

You'll also receive our free program reference book when you place your order.

VIC 20

Group VG 62 Games for Everyone \$7.95
Group VP 54 Programming, Demo, Business
and Home \$7.95
Group VE 35 Educational Programs \$7.95

COMMODORE 64

Group CG 26 Games for Everyone \$7.95
Group CP 30 Programming, Demo, Business
and Home \$7.95
Group CE 16 Educational Programs \$7.95
Group CA 5 Adventure Games (disk only) \$7.95

When ordering, specify group and tape or disk.

Send check or money order payable to:

John Henry Software
P.O. Box 39021
Cincinnati, Ohio 45239

Don't wait! Order your software today! Or write for your free program reference book. You'll be glad you did!

To keep our software prices low, our ad will only appear in the June, August, October and December issues of this magazine.

Why settle for less when you can have Mo?



Introducing Mitey Mo, the ready-to-go modem that turns your Commodore 64® into a telecommunications giant.

Mitey Mo is the complete—and affordable—telecommunications system for your Commodore 64. It will open up a world of practical and exciting uses for your computer, and it will take you online faster and easier than anything else you can buy.

Now you'll be able to send and receive electronic mail, link up with community bulletin boards, play computer games with people in distant places, do electronic banking, and tap into library resources to find the material you need for your reports. All at your convenience.

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

Suppose you dial a number,



MODEM FEATURES	MITEY MO	COMMODORE AUTOMODEM
Auto Dial	YES	YES
Auto Answer	YES	YES
Auto Redial	YES	NO
Smooth Screen Scrolling	YES	NO
Both Cassette and Diskette Software Included	YES	NO
Menu Driven	YES	NO
24K Software Buffer	YES	NO
Function Key Template	YES	NO
Printing Capability	YES	NO
Easy-to-Use Manual	YES	NO
Bell 103 Compatible	YES	YES
Multiple Baud Rates	YES	YES
Dual Cables Included	YES	NO
Single Switch Operation	YES	NO
Warranty	3 years	90 days
Suggested Retail Price	\$99.95	\$129.95

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

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

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

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

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

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

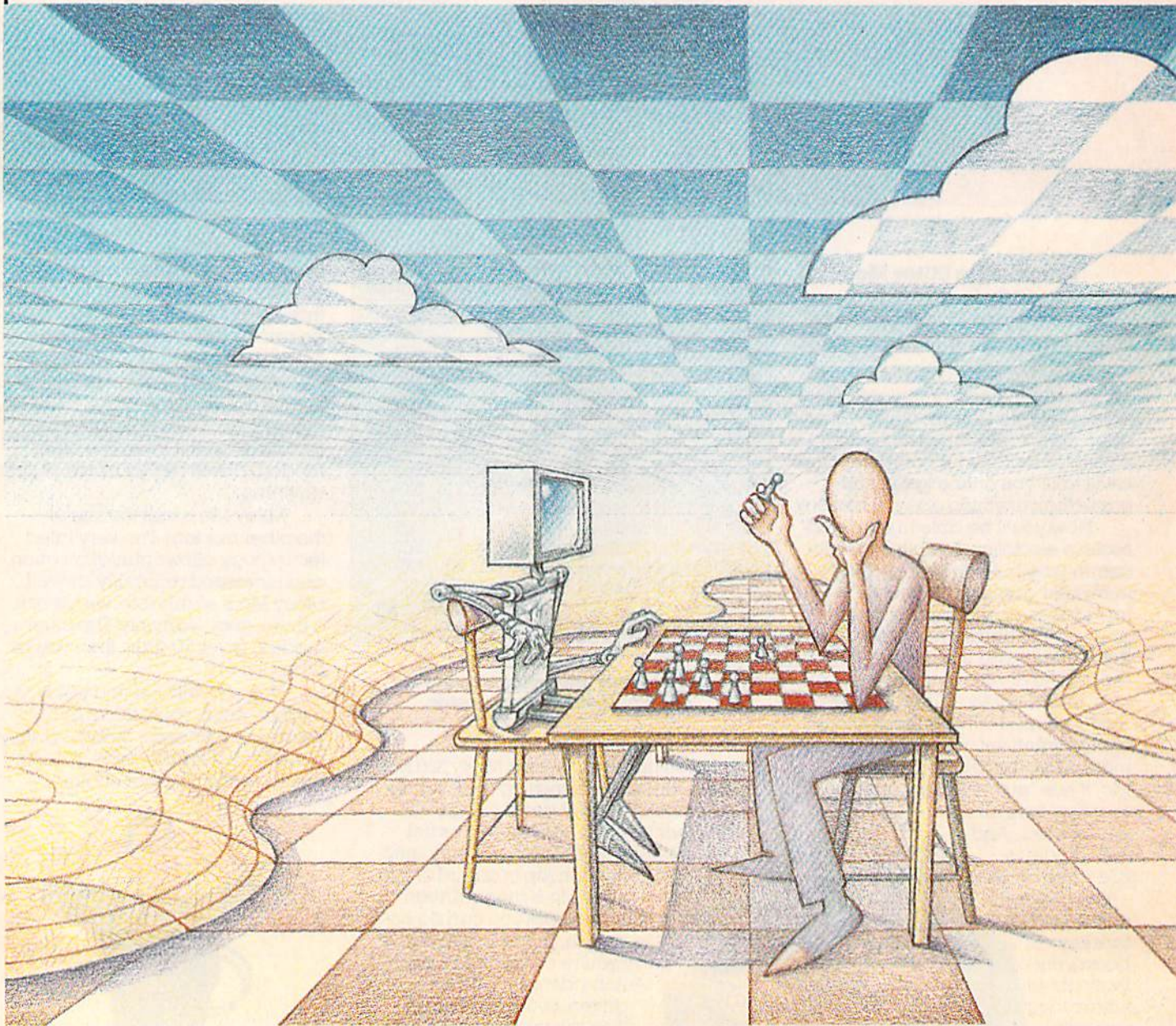
Mitey Mo is half the size of the other modem. The very latest technology allows miniaturization and increased reliability, as well. Mitey Mo is so reliable, we gave it a three-year warranty. The other modem gives 90 days, then you're on your own.


Not only will you find Mitey Mo mighty useful, you'll find it mighty reasonably priced—\$99.95. When you consider how much more you get, there's really no other choice.



TAROCO
19 Rector St., New York, NY 10006
(212) 344-6680

What If...?





The Popularity Of Strategy Games

Selby Bateman, Features Editor

From the ancient games of Chess and Go to modern simulations of business, sports, and warfare, strategy games enthrall us with their complexity and depth. Computer-based strategy games, many of which are available for the Commodore 64, are now coming into their own as sophisticated interactive simulations—the next best thing to being there.

Shall...we...play...a...game?

With that simple question, a supercomputer challenged a teenage computer hacker in the motion picture, *WarGames*. Audiences across the nation were fascinated as the game, *Global Thermonuclear War*, turned from simulation to movie-reality.

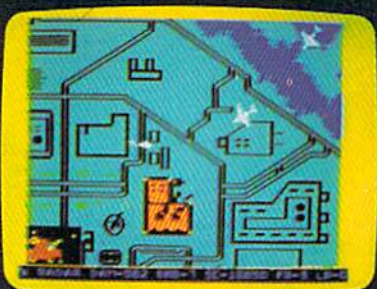
Similar computer strategy games are available in quantity for Commodore owners, and many more are in the works. Their complexity may not rival the one played by the main-frame supercomputer in *WarGames*, but they are remarkably advanced.

Game manufacturers have discovered that computers can bring to the traditional board strategy game three important components: flawless manipulation of hundreds of details, real-time action, and almost limitless variations of game play. The computer also helps to solve

two of the traditional complaints about (non-computer) strategy games: They're too slow and they lend themselves to careless human errors in game book-keeping. Some board war games involve dozens of individual units, with factors for troop movement, terrain, zones of control, morale, reinforcements, weather, and the list goes on. In some of these games, it may take an hour (or more) just to make one move.

"You're going to see even more detail and a lot faster speed in the games," says Joel Billings, president of Strategic Simulations, Inc. (SSI), a company which makes more than twenty computer-based strategy games for the Commodore 64.

"One of the problems we've been working on for five years—and it's getting solved—is that the games started out too slow. People didn't want to get into the [strategy] games on the computer because they saw

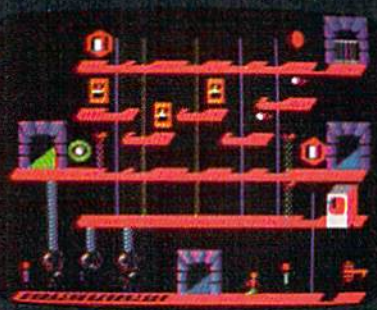


RAID ON BUNGELING BAY™

When you shopped for a computer, you wanted one with a lot of intelligence. This game may lead you to regret that choice, as your friendly little computer becomes the brains behind the most fantastic enemy you will ever face: The War Machine.

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.

Before all of Humankind is crushed beneath the Bungeling Empire's iron heel, one faint hope remains: you in your helicopter.

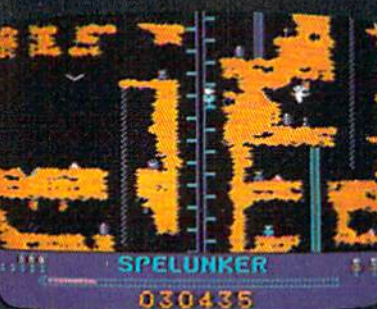


THE CASTLES OF DOCTOR CREEP™

Ever dream that you were locked in a haunted castle, wandering blindly through darkened corridors, never knowing what ghastly demons await you? Then you'll feel right at home in *The Castles of Doctor Creep*.

It's a maddening maze of 13 separate castles, more than 200 rooms in all. Sinister surprises await you behind every door: mummies and monsters, forcefields and death rays, trap doors and dead—very dead—ends. Remember where you've been and watch where you're going...there's got to be a way out *somewhere!*

Better hurry, or you'll wind up playing a rather unpleasant role in one of Doctor Creep's experiments.

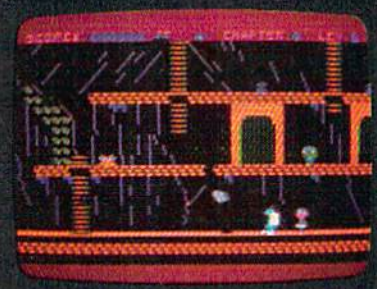


SPELUNKER™

Who knows what fabulous treasures—and unspeakable dangers—await you in the world's deepest cave? This is one game you can really get into...and into...and into.

Wander through miles of uncharted passageways, swinging on ropes and ladders, tumbling over subterranean falls and plunging to the very depths of the earth on an abandoned mine railroad. Deadly steam vents and boiling lava pits threaten you at every turn. Chattering bats and the Spirits of dead Spelunkers beg you to join them, permanently.

Let's face it: you're in deep, deep trouble.



WHISTLER'S BROTHER™

You're the star of a full-fledged arcade adventure—and the big question is whether it'll turn out to be a comedy or a tragedy. That's because your co-star and beloved brother, Archaeologist Fenton Q. Fogbank, is rather absent-minded and extremely accident-prone.

As you search for priceless treasures in steaming tropical jungles, ancient cliff villages, musty old tombs and glittering crystal caverns, you control both your character and your brother. The only way to keep him on track and out of trouble is to whistle and pray that he follows you to safety.

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.

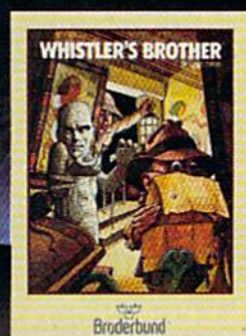
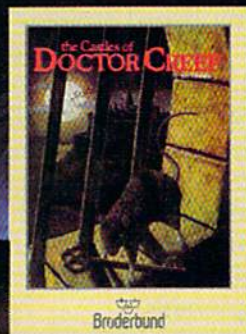
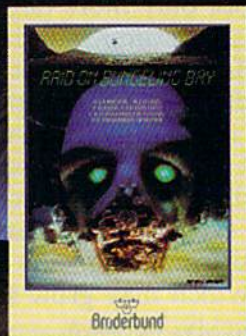


STEALTH™

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.



NO MERCY

FOR COMMODORE.™



CHAMPIONSHIP LODE RUNNER™

It has come to our attention that some of you out there think you're pretty good at *Lode Runner*, 1983's best computer game. For those foolhardy few, we offer a challenge of a higher order: *Championship Lode Runner*.

With fifty fiendish Treasury Chambers: more intricate, more elaborate, more insidious than anything you've seen before. You'll need lots of skill, lots of smarts, and every ounce of your lode-running experience to have any hope at all of survival.

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

Broderbund™

them as very slow compared to hand-eye coordination games.

"That division between hand-eye coordination and strategy games is going to meld together; it's going to disappear," he adds.

SSI and Avalon Hill's Microcomputer Games Division offer more computer-based strategy games than any other companies, with scores of sophisticated simulations on a variety of topics.

A strategy game can be produced to simulate almost any activity. Naturally, the games that sell the best are those which intrigue the most people. Sports games such as baseball, football, boxing, bowling, and golf are all popular subjects of strategy games. Business strategy games also are popular: Manage your own multinational company, wheel and deal on Wall Street, or acquire and merge hotel chains. Avalon Hill even offers a game for the Commodore 64 which recreates a typical week in the lives of the "working class," *TGIF (Thank Goodness It's Friday!)*.

arcade-style game, because strategy and tactics would become more important than reflexes and reactions. You could give orders to the boxers, plan to start fast or slow, train your fighter in different ways, concentrate on offense or defense, and much more. The game would not involve twisting a joystick back and forth; you'd have to plan ahead.

SSI offers you the chance to do just that with its computer game of championship boxing, *Ringside Seat*. Choose your fighters and mix your own set of variables. If your fighter is a slugger, then he can probably charge in more effectively than a classic boxer who may be better at such techniques as sticking and moving. The options under your control are numerous. The computer, of course, does what it does best: keeps track of all those variables. That amount of detail would be almost impossible to monitor without the computer, and probably too boring for anyone other than the most tenacious game players.

This attention to detail

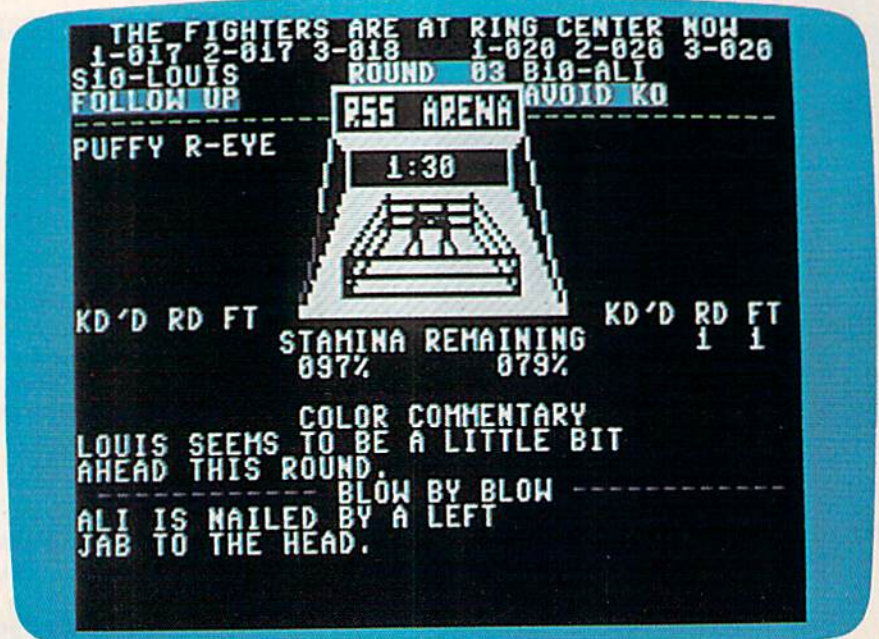
brings not only more depth of play, but can offer months of continuing interest, notes Jack Dodd, director of marketing for Avalon Hill's Microcomputer Games. Game players seem more willing to pay a bit more for this extended play than for the kinds of arcade-style action games which may grow stale very quickly, he says.

Avalon Hill, which began producing board strategy games in 1958 with one title, now has more than 200 board, computer, and video games. Virtually all of the people now producing computer strategy games got their start playing Avalon Hill board games and the play-by-mail games that the company also helped pioneer.

While sports and business are topics for numerous games, the strategy of warfare remains as popular a game subject today as it was when chess was invented. Far more computer strategy games are devoted to studies of historical conflict than any other subject. Just as in *WarGames*, questions

Have you ever wanted to stage a 12-round fight between two of the great heavyweights, matching their individual strengths, weaknesses, and approaches as you manage the round-by-round strategy? What would a bobbing and weaving Larry Holmes have done against a heavy hitting Rocky Marciano?

One way of designing a boxing game would be to concentrate on the fight, pitting one player against the other. It would be an action game where the two players control how much punching goes on. Each player takes on the role of a boxer. But suppose the players stepped back and took on the persona of a boxer's manager? It would no longer be a straight



SSI's Ringside Seat offers more than 45 of the world's greatest fighters. The player plans round-by-round strategy and can alter each fighter's style, ability, speed, aggressiveness, strength, and many other characteristics.

To teach your child to spell, we had to design software that talks.

Cave of the Word Wizard.™ A unique way to develop spelling skills using human speech and arcade action.

Software that tries to teach spelling by jumbled letters isn't a very good teacher. The software has to talk. Now it does. Only on *Cave of the Word Wizard* from Timeworks.

The Wizard talks like a human being, not like a robot. This fascinating character thrusts you into an intriguing adventure as he teaches spelling in the most effective way possible on a computer.

You have wandered into a mysterious cave, and the entrance has been sealed behind you. Suddenly the Word Wizard appears and informs you that in order to leave his cave you must find four magic crystals which have the power needed to open the cave entrance. You have only a flashlight to help you find your way through the cave, and your batteries are running low.

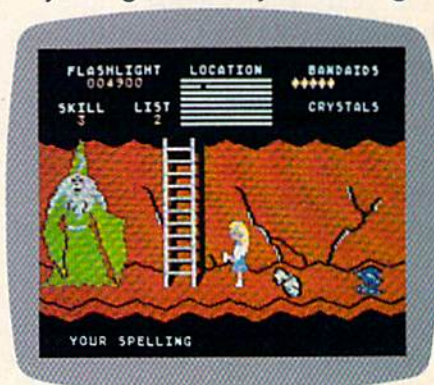
The Wizard is a funny old fellow who causes lots of mischief for anyone who enters his cave. He will appear often and ask you to spell a word—you will actually hear the old Wizard's voice!—and you cannot continue your search until you spell the word correctly.

The Wizard will use his magic powers to replenish the energy in your flashlight if you spell the

word correctly, but each time you are wrong he will draw energy from your light. When your flashlight runs out of energy you will be doomed to roam through the cave in darkness forever.

During your search you will be confronted

with spiders, rocks, snakes, and other dangerous obstacles that will make your quest for freedom even more challenging.



This state-of-the-art educational program includes 500 spoken words in 10 spelling skill levels and

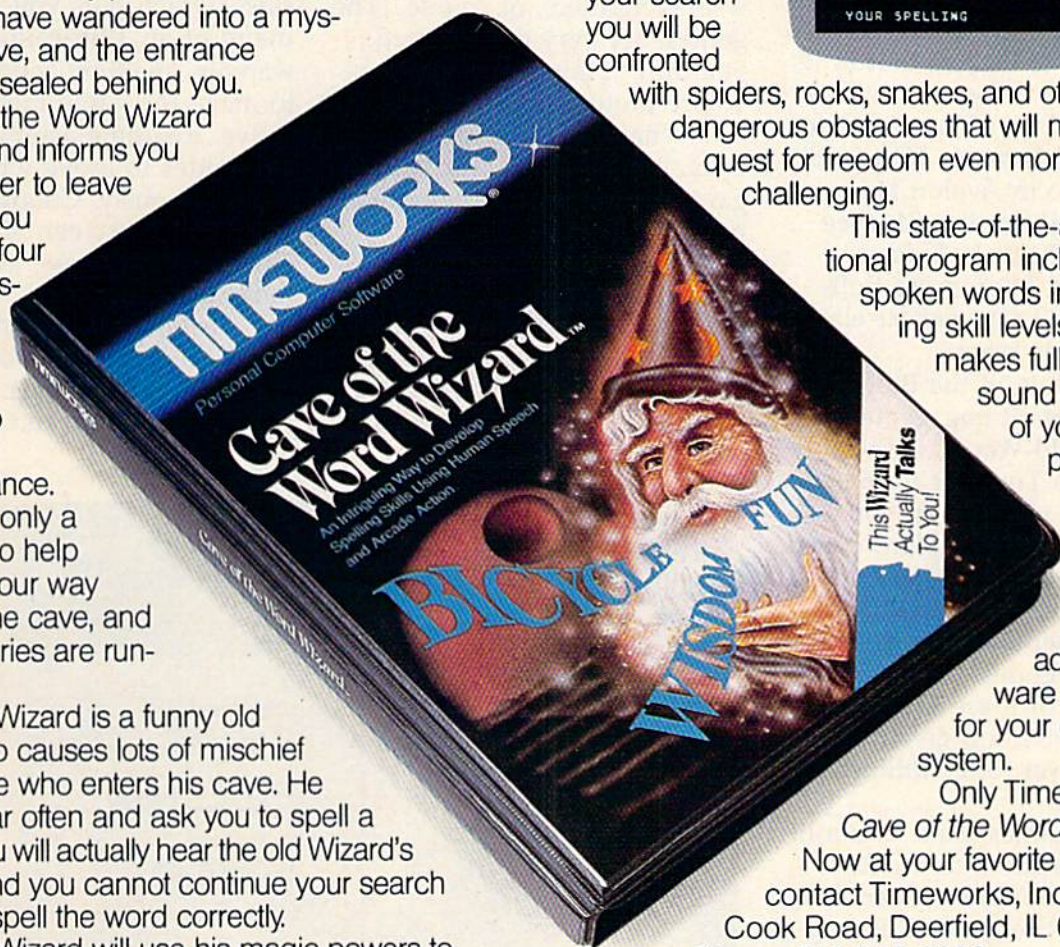
makes full use of the sound capabilities of your computer. The

Wizard will talk to you in clear human speech. No additional hardware is needed for your computer system.

Only Timeworks offers *Cave of the Word Wizard*.

Now at your favorite dealer. Or contact Timeworks, Inc., 405 Lake Cook Road, Deerfield, IL 60015. Phone: 312-948-9200.

Available for Commodore 64*



Timeworks Programs:

- Evelyn Wood Dynamic Reader
 ■ Dungeons of Algebra
 ■ Dragons
 ■ Spellbound
 ■ Computer Education Kits
- Robbers of the Lost Tomb
 ■ Wall Street
 ■ Star Battle
- Presidential Campaign
 ■ Money Manager
 ■ Electronic Checkbook
 ■ Data Manager
 ■ Word Writer

of "what if....?" are providing fascinating games for thousands of Commodore owners.

What if you commanded Caesar's legions against Helvetii barbarian infantry and Belgae cavalry during the Gallic Wars?

What if the Huns, who actually swept through Europe 400 years after Caesar's time, had been met by Caesar himself? Avalon Hill's *Legionnaire* for the 64 offers you the chance to find out.

What if you commanded the German troops invading Russia during World War II? Let your computer move the Russian troops in this campaign which was so crucial to the outcome of the war. Ba'rac Limited allows you to do just that in its new *Road To Moscow: The Eastern Front, 1941-45*, available for the Commodore 64. That's also the scenario in Avalon Hill's *Panzers East!*, for the 64. (See reviews of Ba'rac's *Road to Moscow* and Microprose Software's *NATO Commander* elsewhere in this issue.)

The Battle of the Bulge, another important engagement during World War II, is the subject of SSI's *Tigers in the Snow*. As in most war games, you make your strategic plans based on such factors as troop strength, weather, supplies, airpower, reinforcements, and similar categories.

Critics of these games deplore the attention given to the subject of war. SSI's Billings disagrees.

"War games make you a little more sensitive to the fact that war is not great. Seen from the eyes of the general, it may seem like a lot of fun. But you quickly realize it's very easy to say, 'I'm going to sacrifice this guy over here. It represents 15,000 men, but it's for the greater good.' Then you realize you wouldn't want to be one of those men out there being sacrificed," he says.

Those people who play strategy war games, adds Billings, generally are college educated, interested in history, and have fairly high IQs. "It's an awareness level. People who play war games are more aware of the issues. There's a better understanding of what's going on," he says.

"I don't think you have any more of the jingoistic type of feeling. You probably have less of what you might think would be associated with war games," says Billings. "Studies of the war gamer crowd ten years ago showed that you're dealing with college educated people, and that's why it fits in real well with computers, of course. [The games] are very complicated; you don't play them unless you're pretty smart."

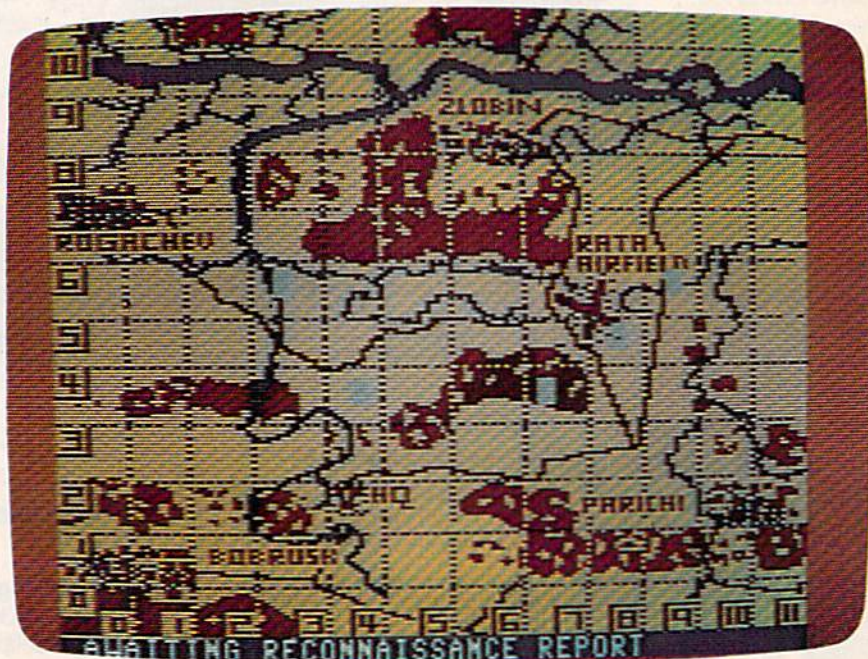
Whatever the pros and cons, it's clear that war strategy games have found a natural habitat in the computer.

Billings says the audiences for computer war games and other strategy games, such as sports or business, are different. From customer response cards, SSI knows that 95 percent of

the people who buy their computer war games have played board war games by Avalon Hill or others. Of the customers who purchase SSI's *Computer Baseball*, Billings says that 62 percent have played a board war game before. "So, you're getting 40 percent of those people who are not wargamers, but happen to be interested in baseball. They don't know what a strategy war game is," he says.

SSI is trying to reach that percentage with several of its new games, which feature real-time action. With games like *Combat Leader*, which includes arcade-style graphics and action as well as strategy, and *Broad-sides*, which puts you in command of an 18th-century warship, realtime action is used to make the game more interactive. Realtime action allows both sides to move virtually simultaneously. Changes even occur off the screen while the game is in progress, adding a more realistic feel.

"In most war games, you sit down and make your move. Then the other player makes his move, and so on. In *Combat*



Among the most popular computer strategy games are simulations of important battles and wars, such as Avalon Hill's Dnieper River Line.

["Hi, we're from Europe. Where's the gold?"]

A SECOND CHANCE to GET the NEW WORLD RIGHT.

IF COLUMBUS HAD LANDED IN NEW JERSEY; if Cortez had been nicer to Montezuma; if Pizarro had been a more generous soul, would the world today be any different?

If you've ever wondered about things like that, you'll like *Seven Cities of Gold* very much indeed.

It's a kind of adventure. An unusually rich and technically impressive one with new continents to explore, natives to encounter, resources to manage and trade routes to establish. But beyond all the neat stuff *Seven Cities* throws up on the screen, there's something else happening here.

It feels quite odd to look at the map and see nothing. Of course you have to explore the more than 2800 screen new world in order to map it. But the way the natives act, the way you get older,



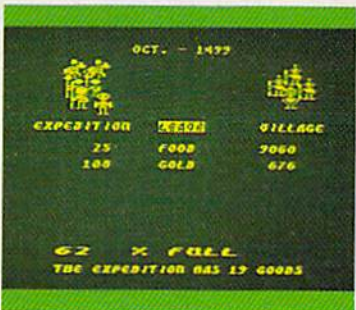
This is Europe, in scrolling 3-D graphics. You outfit, visit the Crown, launch your ships, and if you're cut out for this, you return later to tell all sorts of wild stories about what it's like over there.



There are over 2800 screens to explore in the new world. As you scroll through them, seasons change.



Animated natives surround you. They have no reason to trust you. The drum beat quickens.



Trading with the Aztecs is tricky. You could wind up with enough gold to build an empire. Or as soup.



Home again you view your maps, put yourself on the back, and consider your place in history.

the way seasons change and your men behave, and the way your reputation precedes you gives you a sort of feeling that's unexpected in computer games. It's deeper. Maybe a little disquieting. It plays as much in your head as it does inside your computer.

Seven Cities does all this with the real world or, better still (since the "new" world really isn't anymore), it will construct any number of completely detailed hemispheres for you to try your hand with.

Designed by Ozark Softscape (the people who made *M.U.L.E.*, *Infoworld's* "Strategy Game of 1983"), *Seven Cities* is about as near a recreation of history as has ever been accomplished, with or without a computer.

Find it. Stomp around in it. See if you can't do a better job than all the celebrated figures who got us into the mess we have to deal with today.

SEVEN CITIES of GOLD™

from ELECTRONIC ARTS™



MACHINE REQUIREMENTS: *Seven Cities of Gold* is available for the Apple II, II+, IIe & IIc, Commodore 64 and Atari home computers. *Seven Cities of Gold* and *M.U.L.E.* are registered trademarks of Electronic Arts. Apple is a trademark of Apple Computer Corp. Commodore is a trademark of Commodore Business Machines, Inc. Atari is a trademark of Atari Computer Corp. For a free product catalogue, send a stamped, self-addressed #10 envelope to Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403.

Leader and Broadsides, it's all realtime, so it has the feeling of an arcade game. But it has a lot more strategy built in than an arcade game would have," he says.

Computer strategy games, while already complex, will become even more interactive and sophisticated in the future, says Roger Damon, who designed Brøderbund Software's popular *Operation Whirlwind*, available for the Commodore 64.

"There are just so many possibilities. It's amazing to me that people haven't explored them," says Damon. "When you get into the next generation of computers, some really incredible simulations are going to start coming along."

A battle action set during World War II, *Operation Whirlwind* depends more on strategy than on force as you attempt to move your infantry battalion forward against an enemy-held city. The game was Damon's first computer-based strategy simulation. He's now completed a second game, *Field of Fire*, for the 64, which is being marketed by SSI.

"I dropped down in scale, so that it's no longer companies you're moving around. It's actually fire teams—just small groups of men," says the 34-year-old programmer. "And then it went on from there. The graphics improved. I could make houses look more like houses, and actual blocky looking figures on the pieces instead of military symbols."

In the game, your goal is to take your company of men through a sequence of World War II scenarios that starts in North Africa, goes through Sicily, takes you to the beaches of Normandy, and then into Germany.

"You try to survive with these guys. There's actually a role-playing element where you

can name your own characters. And as they survive the scenarios, they improve," adds Damon.

Avalon Hill's *T.A.C. (Tactical Armor Command)* also brings war strategy games down to the unit level. You have control over individual tanks, anti-tank guns, and infantry squads in this World War II scenario. You build your own combat team from among 40 different armored vehicles representing four of the major powers of World War II. Because of your computer's ability to handle the minutiae of detail, many variables can be included: range, armor thickness, respective speeds and maneuvering capability, visibility, and much more. Even the placement of the

fuel tank on a given tank can be a crucial factor easily accounted for by the computer.

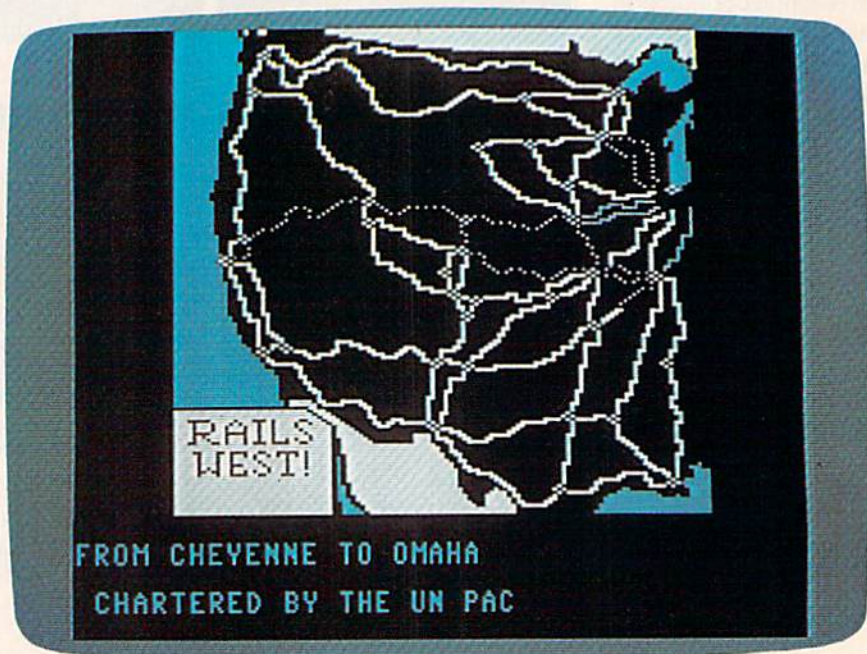
Computer strategy games are already beginning to use more of the memory becoming available on high end computers. Avalon Hill's *Computer Diplomacy*, for example, is a strategy game full of high-level diplomatic intrigues set among the superpowers prior to the First World War. The game requires a 256K IBM PC to run. That's clearly the direction in which future strategy simulations will head as computers become more powerful.

But for now, Commodore owners are strategically placed to take advantage of some of the best such simulation games in the field.

While a number of software developers offer computer strategy games, these two companies produce such a variety that you may wish to send for their catalogs:

Avalon Hill Game Company
Microcomputer Games Division
4517 Harford Road
Baltimore, MD 21214
(301) 254-9200

Strategic Simulations, Inc.
883 Stierlin Road
Building A-200
Mountain View, CA 94042-1983
(415) 964-1353



SSI's RAILS WEST!, in which the player assumes the role of a railroad baron of the 1870s in an effort to build the transcontinental railroad system.

[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.

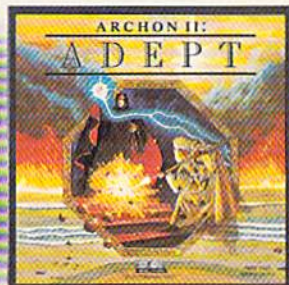
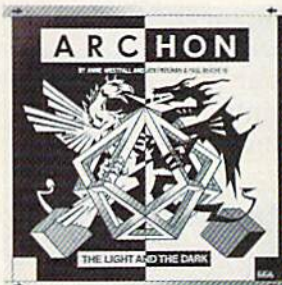


The ADEPT Thunderbird.

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™



CHESS: A "Combinatorial Explosion"

The ancient game of chess provides a good example of the way in which computer strategy games work. It also reveals the allure that such strategy games have had for computer scientists and programmers from the beginnings of the computer era.

When mathematicians first began to think of ways to test the abilities of computers, chess seemed ideal for several reasons. First, the rules are explicitly defined and limited; second, a computer's chess play can be easily compared and measured against that of a person's; and third, there is no one correct answer, only a constantly changing series of positions which the computer must continually analyze and reanalyze.

The 19th century inventor Charles Babbage theorized that games like chess and tic-tac-toe would be excellent indicators of how successfully an "analytical engine"—that is, a computer—could mimic human thought. Today, computer chess programs have been written which rival the strength of very good players; although even the strongest computer chess game is not yet superior to the world's best chess grandmasters.

Microcomputer chess games like *Sargon II* from Hayden Software (600 Suffolk St., Lowell, MA 01853) and *Chess* from Odesta (3186 Doolittle Drive, Northbrook, IL 60062)—both available for the Commodore 64—offer varying levels of play, demonstrations of moves and strategies, and other options that the first mainframe computers could never have included.

Translating Strategy To Numbers

In order to function, chess programs must assign numerical values to each chess piece. The lowly pawn might be assigned a one, for example; the queen, a nine; and the indispensable king, a number high enough to discourage the computer from ever risking its capture. Advanced computer chess games also consider values assigned to certain positions on the board as well—the center, with

its variety of possible moves, being generally better than a corner position or one along the side of the board.

Using a trial-and-error method, computer chess programs search every possible move and countermove, calculating numerical totals based on pieces captured or lost in subsequent combinations of moves.

If a computer, even a supercomputer, were asked to consider without limit each combination from the first move in a game of average length (say forty moves), what would occur would be a geometric progression of possible games—a virtual combinatorial explosion—which has been calculated at something like one million to the twentieth power, or a one followed by 120 zeros. Computer chess programmers can build in routines, however, which will limit the number of moves a computer will analyze per turn. Other techniques can be applied in chess programs which will diminish even further the total number of combinations needed to be considered by the computer to those which apply directly to a given situation.

All strategy games use some variation of this basic formula, but with additional complexities built in. There are no random elements in a game of chess. But in many of the most popular strategy games, there are such variables as weather conditions, fatigue factors, supply problems, and even troop morale fluctuations which may influence the outcome. In this way, strategy games can more accurately simulate the random elements of real life than does the game of chess.

Instead of the computer having to keep track of 16 pawns and 16 major pieces for both sides in chess, many strategy games require that the computer follow hundreds of different pieces, calculate time and strength differences, introduce random elements, and figure dozens of other variables. In the final analysis, whether the computer game is chess or the most complex simulation of business, sports, or war, the same numerical value system is at the heart of them all.



IT'S HERE

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.

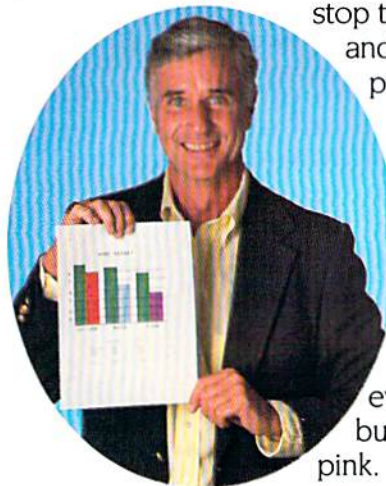
If you use your personal computer to keep track of mortgage payments, tuition payments, balance your checkbook or jump ahead of the Dow Jones', there's good news for you. You'll find that the new OKIMATE 10 gets down to business quickly. And easily.

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



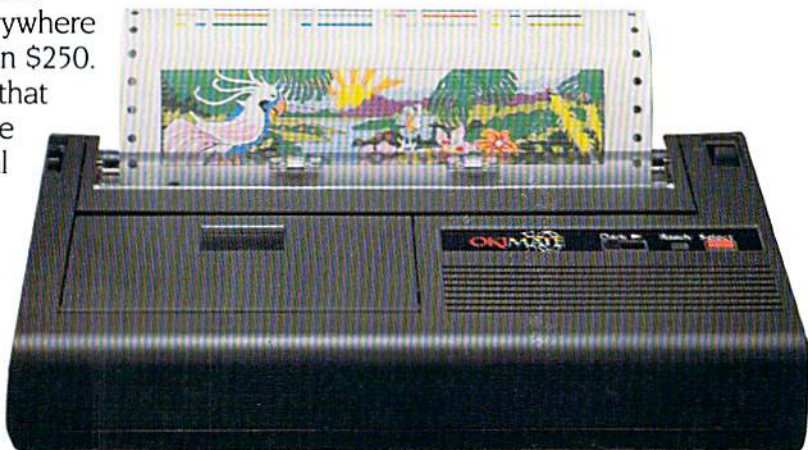
stop there. To help you and your personal computer keep within your personal budget, they made the OKIMATE 10 available at retailers everywhere for less than \$250. Something that should make every personal budget tickled pink.

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!

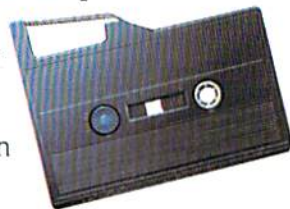


Q: Is the OKIMATE 10 easy to use?

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.

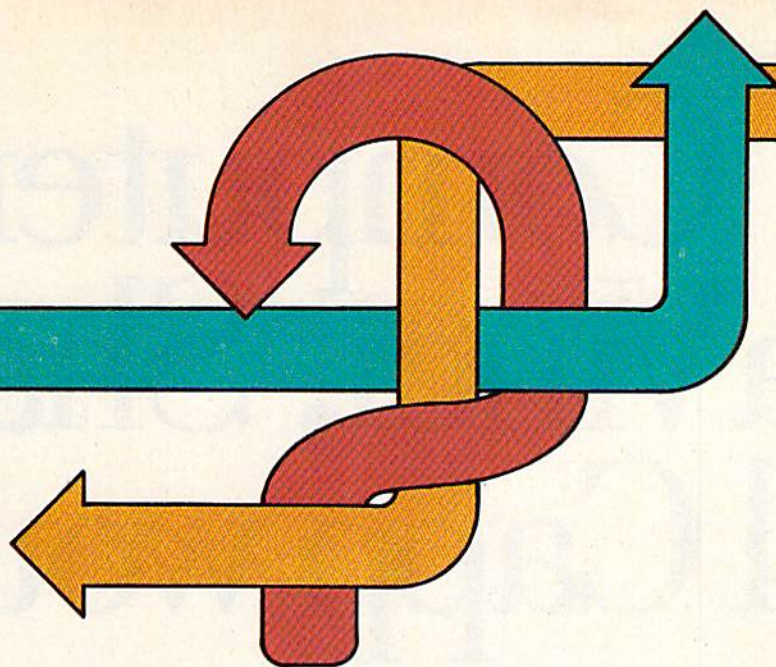


Q: What about reliability?

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.

OKIDATA
an OKI AMERICA company

Available at retailers everywhere.



Electronic Trivia

Kathy Yakal, Feature Writer

It seemed to hit last Christmas. Thousands of holiday travelers, returning from visits with relatives, had a new way to pass the time while making the long trek home. *Trivial Pursuit* had been under a lot of Christmas trees, and it was suddenly the hottest game since *Monopoly*.

Party guests who normally would have excused themselves early to avoid icy midnight winds found themselves staying well into the early morning hours at January parties. Everybody wanted to play, and manufacturers couldn't keep up with the demand.

Waiting lists for the wildly popular game stretched for pages. Store clerks, tired of constant queries, posted signs saying, "We are out of *Trivial Pursuit*."

Sales of *Trivial Pursuit* will reportedly reach \$750 million in the United States alone this year. The entire board game industry took in less than half that amount in 1983: \$310 million.

Who was the first NHL player to earn \$100,000 per season? What does a buffalo lack which a bison has? How many states border Tennessee? Trivia questions have fascinated and frustrated people for years. More recently, trivia buffs have been able to enjoy an explosion of new trivia board games. Many new trivia games are now available for the Commodore 64.

Monopoly, the best-selling board game of all time, may soon lose that title. It took 49 years for *Monopoly* to sell 85 million sets worldwide. *Trivial Pursuit* is expected to sell more than a quarter of that total in one year's time in the U.S.

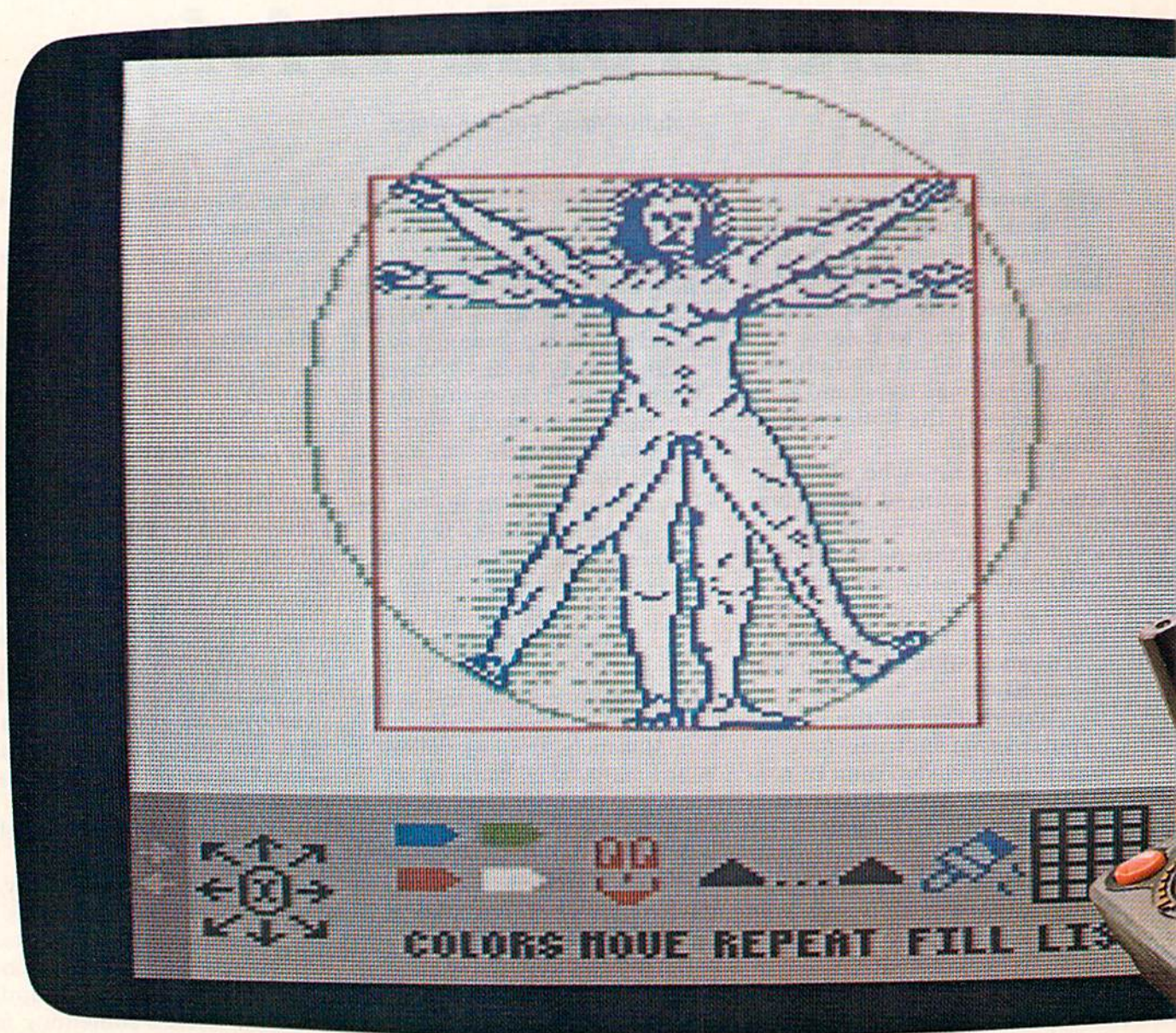
This recent surge of popularity in a trivia game has spawned many clones. (There are even trivia board games sold

by news magazines and television shows.) And at least a dozen Commodore 64 versions have sprung up in half as many months. Some are the products of familiar software publishers, but more than one company has formed for the sole purpose of supplying trivia games to home computer owners.

These games vary greatly in format. Some are multiple-choice, and require the players to enter the correct answer (via joystick or keyboard) before other players do, or before a time limit is up. Others supply the question but no hints; the correct answer is displayed after everyone has guessed. And at least one incorporates an arcade game format, giving players a chance to brush up on their hand-eye coordination as well as their memory.

Question categories vary, from such standard topics as television and movies, sports, and geography, to areas such as body language, antiques, and phobias. There's something for everyone.

Computer prog da Vinci, Shakesp Al Capp would ha



grams for kids that eare, Dickens and ve loved.

If they were starting out today, this is what they could start with. Pixelwerks.

THE OTHER WAY TO DRAW AND WRITE

Instead of a brush and canvas, a pen and paper, they'd create on a computer. Because Pixelwerks is the first medium that can keep up with their imaginations.

MR. PIXEL'S PROGRAMMING PAINT SET

With Mr. Pixel's Programming Paint Set, da Vinci (or any 8-year old) could do more than paint a picture. He could also enlarge it, repeat it, move it around, and change colors. Instantly.

And at the same time, he would be developing his programming skills. Painlessly.

SHOW DIRECTOR

On the other hand, Shakespeare would love to play around with Show Director.

He'd use it to create plots and think up one scene after another, and he'd get a big cast of characters, lots of backgrounds, props, and musical sound effects to act them out.

BANK STREET STORYBOOK

Dickens wouldn't be able to keep his hands off Bank Street StoryBook by George Brackett.

Not only could he write his own story, but he could also illustrate the scenes and characters he sees in his mind.

MR. PIXEL'S CARTOON KIT

Maybe Al Capp wouldn't be satisfied with cartoons that just sit on the page after he tried Mr. Pixel's Cartoon Kit. Because he could make his cartoons come to life by animating them. His characters could move around, and even react to each other.

Every kid has a touch of creative genius buried inside. The job of Pixelwerks is to bring it out, with more features, more options and more flexibility than other programs.

In short, we supply the tools. Kids supply the imagination.



 **PIXELWERKS**

Why the mania? "Trivia has been around for a long time, but we just haven't noticed it as much," says Doug Monahan, co-founder of a Dallas-based software company, Trivial Compute.

Monahan's point is well taken. TV game shows, dating from the early days of *The \$64,000 Question* and *GE College Bowl*, to the recent revival of *Jeopardy*, have had people shouting answers from arm-chairs at home for years. In the pre-arcade game days, airports and other public places had coin-operated "test your knowledge" games. Monahan recalls heated verbal trivia matches in moments of boredom during his days at West Point.

"In the '60s, everyone was protesting. In the '70s, no one knew what was going on. Now, in the '80s everyone is conscious of living well," he says. "It's chic to drive a big car and know lots of stuff."

The latest in Trivial Compute's series of trivia games is the World Class Edition, focusing on the lifestyles of the rich and famous, international sports and resorts, royalty and celebrities. Questions range from "What city is Yale University in?" to "What is the name of the breed of the \$2000 dog featured in the '83 Neiman-Marcus Christmas catalog?" and "What ski resort in America offers skiing in July?"

"What we're selling is information," says Monahan. He sees his move into the trivia game business as a natural progression from his years working with data base management systems.

Other editions available from Trivial Compute include *Trivia Americana*, *West Coast Trivia*, *New York Insignifica*, and *Texas Trivia*. They're in the process of completing a talking trivia game, which uses the Covox Voice Master, a speech

synthesizer for the Commodore 64.

Also entering the trivia game arena is software publisher Screenplay. "Everyone has been asking trivia questions of each other for years, like 'What was the name of Sky King's airplane?'" says company president Sandy Schupper. "Trivial Pursuit started out the public awareness of trivia. We looked at the computer as a perfect medium, because not only

Most of the trivia games currently available emphasize getting the right answer within a pre-determined time limit. Players take turns answering questions, and the winner is usually the person who obtains the prescribed amount of points first.

Suncom's *PQ: The Party Quiz* requires quick reflexes as well as the correct answer. The game comes with four hand controllers connected to cables



Shoot down the character representing the category you want to choose (sports, music, television, science, or general knowledge), and answer correctly to win one letter in the word "TRIVIA" in Screenplay's Trivia Arcade.

does it give you the basics of a trivia game, but it gives you a little more excitement, using the computer's sound and graphics."

Screenplay's *Trivia Arcade* takes advantage of the Commodore 64's sound and graphics capabilities through its arcade game format. Before each question is displayed, players must chase down the figure representing the category they want. Each correct answer is rewarded with one of the letters in the word "trivia." Once a player spells out the entire word, he or she must answer a question correctly in each category to win.

Trivia Arcade contains 3500 questions in five categories: sports, television, science, music, and general knowledge. Additional disks, containing up to 4000 questions each, will be available this winter.

that plug into the Commodore 64's two joystick ports. Each controller has four touch-sensitive pads on it. After the question and four possible answers are displayed, the first player to hit the correct button corresponding to the right answer on the screen gets points.

The game can also be played in *social*, as opposed to *competitive*, mode. Everyone who answers the question correctly within the time limit gets points. The faster you answer, the more points you get. Other user-controlled functions are response time (3-10 seconds) and game length (5-20 rounds; 10 questions per round).

Every few rounds, each player must take on the computer in a *lightning round*, where ten questions are displayed in 20 seconds. The more questions answered correctly, the more

DRAGONRIDERS OF PERN.[™] FLY THE UNFRIENDLY SKIES.



Shooting down the menacing and constantly multiplying Threads isn't easy, but it's only one of the challenges in this official computer game version of Anne McCaffrey's famous book series.

Your strategy will be put to the test as you try to negotiate alliances with Pern's Lord Holders in an attempt to form the most powerful Weyr on the planet. Should you take a firm stance or compromise? Will asking a Craftmaster for assistance increase your chances for success? Maybe you should invite prospective allies to a Wedding or even a Dragon Hatching. Remember to check the Lord Holders personality traits

first. It may be critical to your success.

Numerous screens combine to create truly unique and challenging game play. There's even a practice screen to sharpen your Thread Fighting skills.

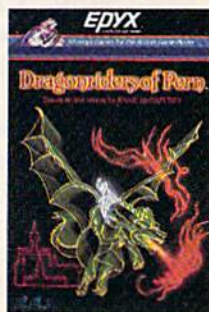
If you liked the books, you'll love the game. After all, how often do you get the chance to actually fly a dragon?

One to four players, joystick and keyboard controlled.



EPYX[™]
COMPUTER SOFTWARE

Strategy Games for the Action-Game Player



bonus points awarded.

It's rather ironic that trivia is so wildly popular. School children despise tests. Even college students, interested as they may be in their chosen subject matter, tend to groan when finals come around.

Though labeling trivia games as "educational" might mean death to them in the entertainment market, the fact is that they *are* educational. We don't always retain the answers

that crop up in *Trivial Pursuit*, says Paradiso. One of those irritations is the guy who jumps up and down and yells "I know! I know!" at every question.

Professional Software is also looking at trivia games as educational software of the future. But their prime purpose for producing *Trivia Fever* is entertainment.

Trivia Fever is Professional's first entry in the entertainment software market, though they're well-known as the publishers of *WordPro*, the popular word processor, for the Commodore line.

To combat this, *Trivia Fever* allows handicapping. Players who are more knowledgeable in a particular area, or in all areas, can be required to answer more questions, more difficult questions, or be given less time to answer.

"Handicapping is very important," says Paradiso. "You can make the game dynamically different for every person that's playing. It also allows families to play together more easily. By handicapping the parents, the kids have a better chance to win."

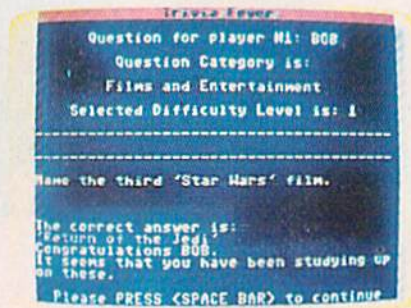
Trivia Fever can be played with or without a computer (a book of questions and answers and score sheets are included). Suggested retail price is \$39.95, but purchasers who don't own computers can mail back their disk for a \$5 rebate.

To supplement the thousands of questions contained in *Trivia Fever*, Professional Software plans to release editions specializing in sports, entertainment, word trivia, and an educational series, targeted to junior high and high school students.

Other trivia games currently available for the Commodore 64 include:

- *Master Trivia*, from Cymbal Software. Up to six players; game lengths of 50, 100, or 150 points, and time limits varying from 10-20 seconds. Cymbal has released additional disks that can be integrated into play with the master disk. Categories include sports, world facts, "Entertainment Tonight," and children's trivia.

- *Factactics*, from Daystar Learning Corporation. Players move around a game board on the computer screen, typing in answers to questions on sports,



In Professional Software's *Trivia Fever*, you can opt to select your own category or let the computer choose one randomly. Once the player has given an answer, the gamemaster tells the computer whether or not it was correct, and points are awarded.

to all the questions we miss (although we certainly do if we miss them a second time), but we're often reminded of all the things we've forgotten since school days.

One trivia game that could easily be used in a classroom setting is *Trivia Trek*, by MMG Micro Software. The game contains 500 multiple-choice questions in ten different categories, ranging from antiques to inventors to U.S. statistics. There's even a section on Commodore facts: (PRINT CHR\$(147)) will cause: 1. Clear screen 2. Clear memory 3. Snow 4. Carriage return.)

What makes this game a potential educational tool is its *Editor* section. Subject matter is not limited to the questions written by the software designer: Using a separate disk for storage, players can make up

"We wanted to enter the entertainment area, but needed to find out first what was entertaining to people," says Ken Paradiso, marketing manager for Professional Software. Their research pointed to trivia. Trivia game sales had jumped from \$600,000 in 1981 to \$70,000,000 in 1983. Sales for 1984 are projected to exceed one billion dollars.

Further research revealed why Americans planned to spend that non-trivial amount of money on trivia. "One reason is obviously the maximization of social interaction," says Paradiso. "Another is the ego hit you get from the game. It's an all-win situation because even if you miss a question, it's not important. It's only trivia. People don't come down on you."

Trivia Fever was designed to minimize some of the annoy-

THE WORLD'S GREATEST BASEBALL GAME. THERE'S MUCH MORE TO WINNING THAN JUST PITCHING, HITTING & FIELDING.



Real baseball is more than just hitting, pitching and fielding. It's also your favorite major league teams, the great stars of today and the All-stars of yesteryear. It's statistics and coaching, and it's managing your own game strategy. With the World's Greatest Baseball Game, you have it all. Pick your major league line-up using the actual player and team stats. Then watch the action unfold against an opponent or the computer.

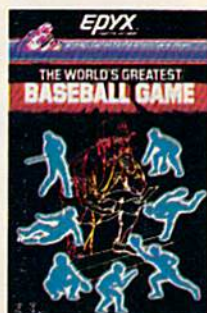
Two modes let you choose between managing and controlling your team or managing only. The World's Greatest Baseball Game—everything you could ever want except the hot dogs and peanuts.

One or two players; joystick controlled.



EPYX
COMPUTER SOFTWARE

Strategy Games for the Action-Game Player



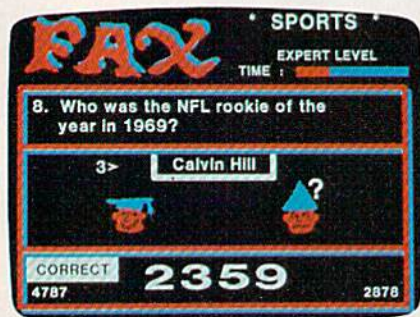
music, rock & roll, TV, movies, and Americana.

- *Fax*, by Epyx. This is the home computer version of the Exidy arcade game.

- *Computrivia*, by Extek. Over 1300 non-repeating questions on the arts, business and

politics, geography, science and nature, history, entertainment, and odds and ends. Once the

initial game parameters are set, only the space bar need be used for input.



Answer a question correctly in Epyx's FAX and you get to wear a mortarboard. Get it wrong and you're stuck with the dunce cap. FAX includes over 3,700 questions in the areas of entertainment, history, sports, or potpourri.

For more information, contact:

Computrivia (\$34.95)
EXTEK Computer Aided
Products
P.O. Box 305
Oakville, Ontario,
Canada L6J 1N0

Factactics (\$29.95)
Daystar Learning Corporation
525 University Ave.
Palo Alto, CA 94301

Fax (\$27.00)
Epyx, Inc.
1043 Kiel Ct.
Sunnyvale, CA 94089

Master Trivia (\$29.95; \$19.95
for additional disks)
Cymbal Software
1200 Rt. 23
Butler, NJ 07405

PQ: The Party Quiz Game
(\$69.95; \$24.95 for additional
disks)

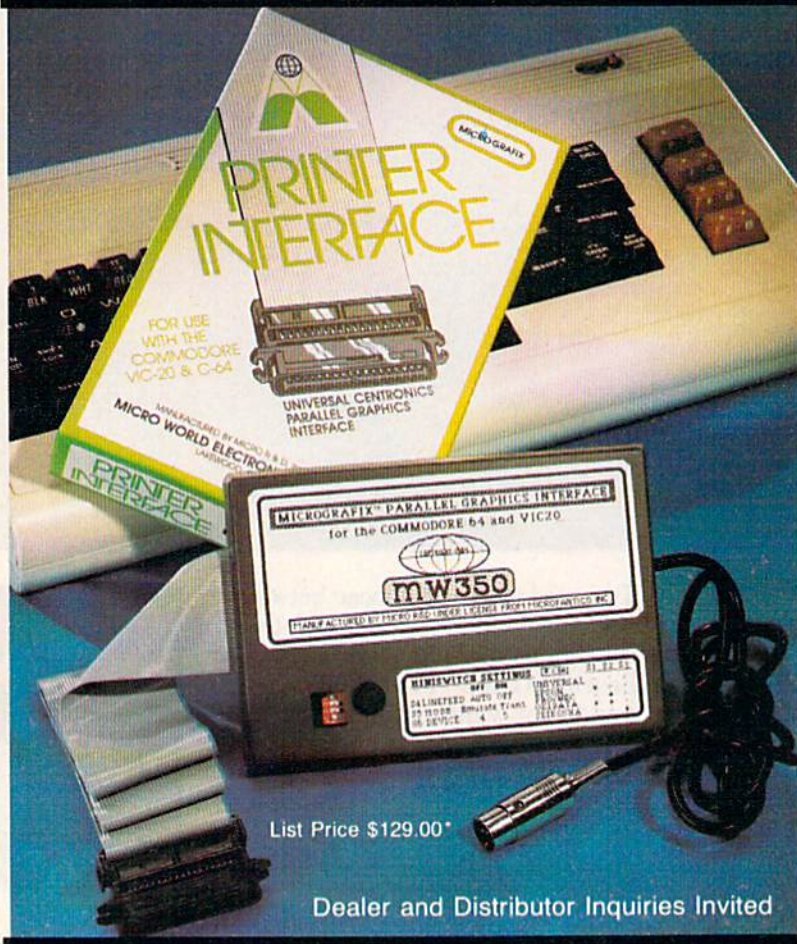
Suncom
260 Holbrook Dr.
Wheeling, IL 60090

Trivia Arcade (\$34.95)
Screenplay
500 Eastowne Dr., Suite 212
Chapel Hill, NC 27514

Trivia Fever (\$34.95)
Professional Software
51 Fremont St.
Needham, MA 02194

Trivia Trek \$29.95)
MMG Micro Software
P.O. Box 131
Marlboro, NJ 07746

Trivial Compute (\$34.95)
The Trivial Compute Company
3527 Oak Lawn Ave., Suite 179
Dallas, TX 75219



List Price \$129.00*

Dealer and Distributor Inquiries Invited

COMMODORE OWNERS:
"Finally, A Universal Graphics Interface!"

The ALL NEW "MICROGRAFIX" parallel interface by Micro World Electronix Inc., is a complete switch selectable interface with full graphic capabilities for the VIC 20™ and Commodore 64™. It's truly the most universal of Interfaces with the capacity to print the Commodore® graphics set, since it is switch selectable for virtually all centronics compatible parallel printers including Daisy wheel printers.

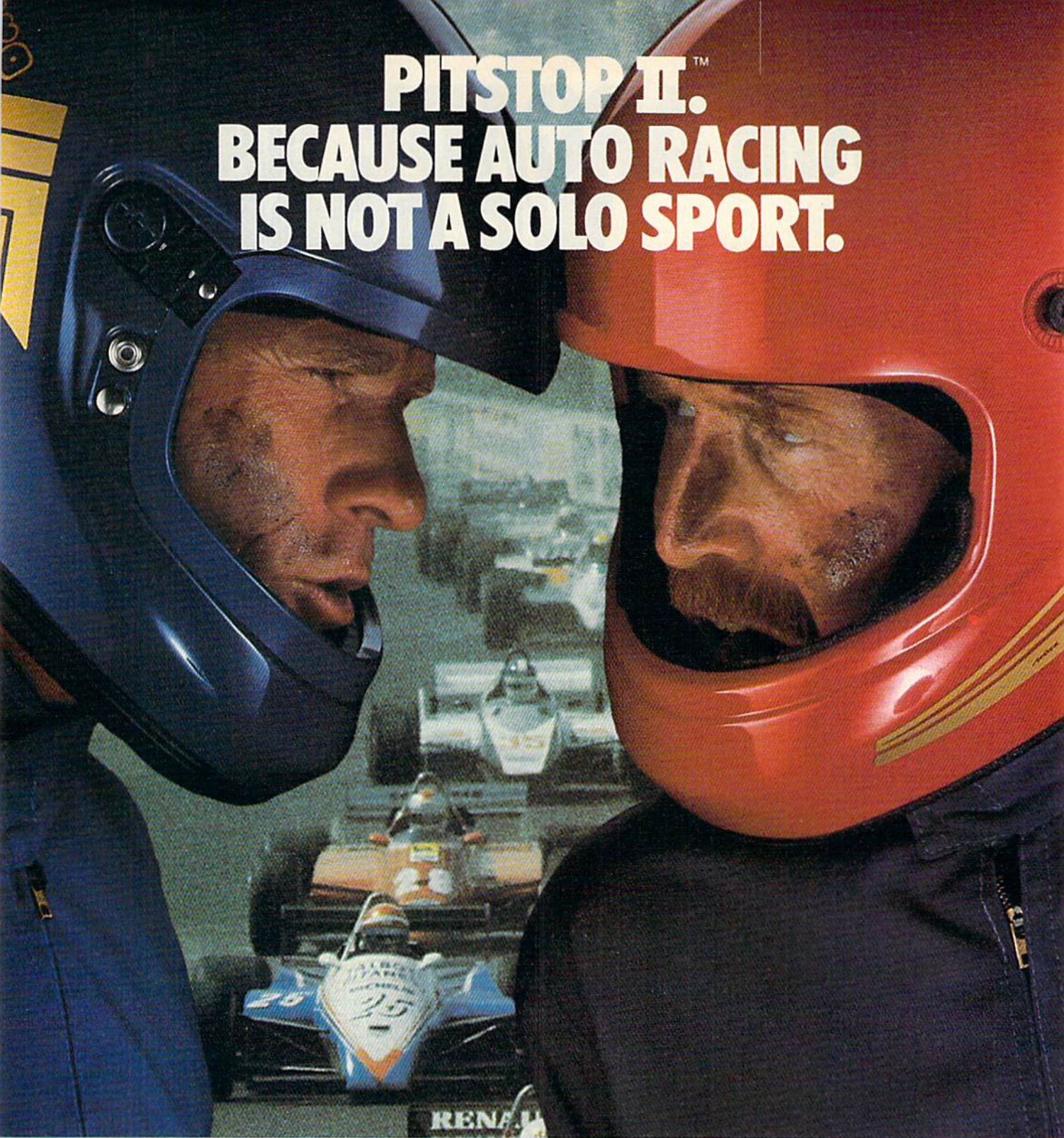
- Features:
- 1) Fully intelligent interface that plugs into the Standard Commodore® printer socket.
 - 2) Complete graphics capability that will allow popular matrix printers to fully pass the Commodore® Printer test (including Inverse text, tabbing, cursor up/down, etc.).
 - 3) Works with virtually all software, since it provides emulation of the Standard Commodore® Printer.
 - 4) Optional user installed 4K buffer to speed up graphics and text printing.
 - 5) Complete built-in status and self-test report.
 - 6) Switch Selectable Commodore® graphics mode for most popular printers (Epson, Star Micronics, C. Itoh, Prowriter, Okidata, Seikosha, NEC, Riteman, Banana, BMC, Panasonic, Mannesman Talley and others) plus a Universal Switch mode for letter quality printers.
 - 7) Complete with emulate mode, transparent mode, total text mode, ASCII conversion modes that will insure virtually total compatibility with popular Software.

No more ROM changes or extra shelf space taken up. The Micrografix Interface is easier to stock since one interface will support virtually all printers.

Order From:
MICRO-W.
DISTRIBUTING, INC.
1342B Route 23
Butler, New Jersey 07405
(201) 838-9027

*™ Trademarks of Commodore Business Machines, Inc.
*Call for details on our super \$50.00 trade-in offer.

PITSTOP II.™ BECAUSE AUTO RACING IS NOT A SOLO SPORT.



When we introduced Pitstop, we created action in the pits. Now, with PITSTOP II, EPYX introduces true competitive auto racing, both on the track and in the pits. Auto racing is not a one man sport. With PITSTOP II,

you can now experience the thrill of speed and competition as you battle your opponent in a race against the clock. Now, more than ever, the strategy of when you make a pit stop and your pit crew's speed and performance, combined with your skill on the track, will determine the winner.

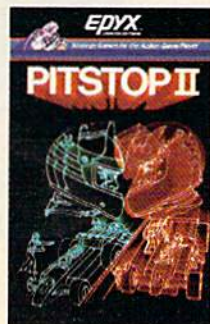
A split screen shows you your position and that of your

opponent, a digital clock displays time and a lap counter gives you your race position as you race against each other in pursuit of the checkered flag. You can also play against the computer or take a few practice laps as you prepare for the real head-to-head competition. Step up to PITSTOP II because auto racing is not a solo sport.

One or two players: joystick controlled; disk or cassette.



Strategy Games for the Action-Game Player



OUR ARCADE GAMES WE BROUGHT



Bally Midway's *Spy Hunter* puts you in the driver's seat of the hottest machine on four wheels. You're after enemy spies. The situation is life and death. You'll need every weapon you've got—machine guns, and guided missiles, oil slicks and smoke screens. But the enemy is everywhere. On the road, in the water, even in the air. So you'll have to be more than fast to stay alive in *Spy Hunter*. You'll need brains and guts, too.

Do you have what it takes?



Bally Midway's *Tapper* would like to welcome you to the fastest game in the universe.

You're serving up drinks in some of the craziest places you've ever seen. And the service better be good, or else. You'll work your way through the wild Western Saloon to the Sports Bar. From there to the slam dancing Punk Bar and on into the Space Bar full of customers who are, literally, out of this world!

Are you fast enough to play *Tapper*? If you have to ask, you probably already know the answer.



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.

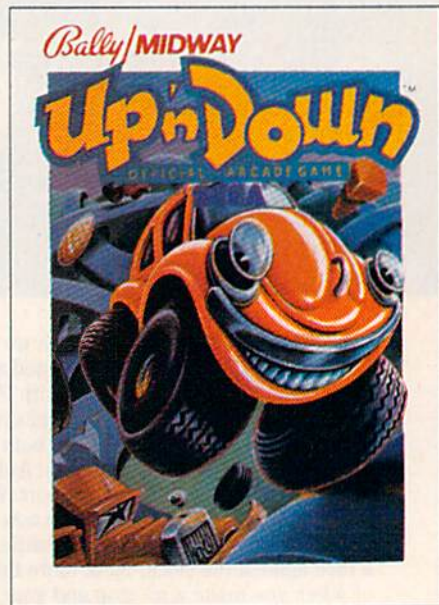
Crashing, bashing *Up 'N Down*. It's one smash hit that really is a smash.



The #1 Arcade Game of 1984.



Nominated as Most Innovative Coin-Op Game of 1984 by *Electronic Games* magazine.



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

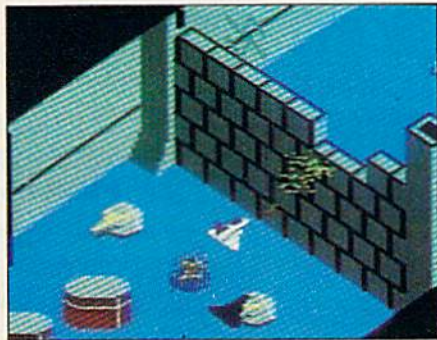
WERE SUCH BIG HITS, THEM HOME.



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.

Congo Bongo. It's fast and it's fun. But be careful. It's a jungle in there.



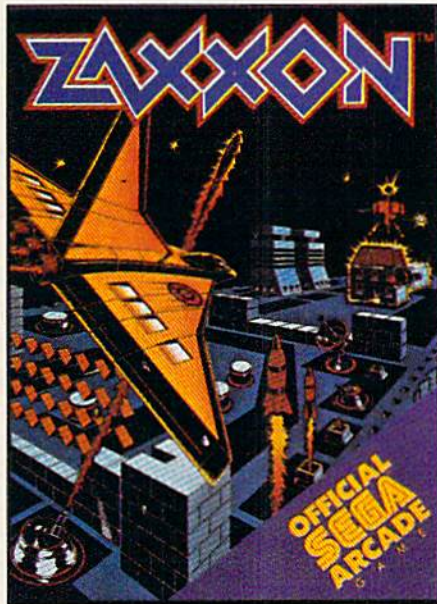
Sega's Zaxxon. If you haven't played Zaxxon, you must have been living on another planet for the past few years.

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.



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



One of only ten games ever to make Electronic Games' Hall of Fame.

	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	✓ NEW	** NEW	** NEW

- ✓ Published by Sega Enterprises, Inc.
- ✓ Published by Datasoft, Inc. under license from Sega Enterprises, Inc.
- ✓ Published by Coleco Industries, Inc. under license from Sega Enterprises, Inc.
- ✓ Published by Synapse Software Corporation under license from Sega Enterprises, Inc.

*Atari 400, 800, 600XL, 800XL and 1200XL.
(Congo Bongo cartridge; 400, 800 and 800XL.)

†Atari 800, 600XL, 800XL and 1200XL.

**Also available for IBM PCjr.

All new games are scheduled to be in your stores for Christmas. Check your local dealer.

©1984 Sega Enterprises, Inc.

†Number of game levels varies on cartridges for Atari and Commodore systems. Atari, 2600, 5200, 400, 800, 600XL, 800XL, and 1200XL are trademarks of Atari Corporation. Commodore 64 is a trademark of Commodore Electronics, Inc. ColecoVision and ADAM are trademarks of Coleco Industries, Inc. Apple, II, IIe, and IIc are trademarks of Apple Computer, Inc. IBM, PC and PCjr are trademarks of International Business Machines Corp. UP 'N DOWN is a trademark of Sega Enterprises, Ltd., manufactured under license from Sega Enterprises, Ltd., Japan. Videogame copyright ©1983 Sega Enterprises, Ltd. BALLY MIDWAY is a trademark of Bally Midway Mfg. Co. Package and program copyright ©1984 Sega Enterprises, Inc. TAPPER and SPY HUNTER are trademarks of Bally Midway Mfg. Co. Videogame copyright ©1983 Bally Midway Mfg. Co. All rights reserved. ZAXXON is a trademark of Sega Enterprises, Inc. Copyright ©1984, Sega Enterprises, Inc. CONGO BONGO is a trademark of Sega Enterprises, Inc. Copyright ©1983, Sega Enterprises, Inc.

SIMPLE ANSWERS TO COMMON QUESTIONS

Tom R. Halfhill
Staff Editor

QA

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

Q. I own a Commodore 64, and I have a few friends who own Atari 800XLs. I'd like to know if it's possible to convert programs written in Atari BASIC to Commodore BASIC. If this is feasible, are there any publications that can guide me in converting programs? Also, is there any program that would allow me to use disks formatted for the Atari on my Commodore 64? I have a Commodore 1541 disk drive.

A. It's quite possible to convert programs written for Atari computers to work on Commodore computers, and vice versa. In fact, our staff programmers do this all the time for our companion magazine, COMPUTE!. Fortunately, the Commodore 64 and Atari computers have similar features, making conversions easier. Both machines have sprites (called *player-missile graphics* on the Atari), comparable high-resolution graphics, programmable character sets, and versatile sound capabilities.

However, unless you're a pretty good programmer, translations will not be a snap. While the Atari and Commodore both have built-in BASIC languages, the BASICs are two different dialects. Commodore BASIC is Microsoft BASIC, the most common version found on microcomputers. Regular Atari BASIC closely resembles Microsoft BASIC, but differs in several ways. Sometimes these differences matter, and sometimes they don't—it depends on the program.

For example, programs which use lots of string manipulations may be hard to translate back and forth. Atari BASIC lacks the string arrays and substring statements found in Microsoft BASIC. The statement:

```
DIM A$(10,10)
```

sets up a two-dimensional string array with 100 elements on the Commodore 64, but would trigger a syntax error on the Atari. The Atari recognizes only one-dimensional strings. This statement:

```
DIM A$(20000)
```

would be interpreted quite differently on an Atari

and a Commodore. The Atari would reserve a single string variable 20000 bytes long; the Commodore would reserve a one-dimensional string array with 20000 elements. That's because Microsoft BASIC limits strings to 255 characters, while Atari BASIC allows strings of any length, up to the limit of available memory. These statements:

```
X$ = LEFT$(A$,10)
```

```
X$ = MID$(A$,11,10)
```

```
X$ = RIGHT$(A$,10)
```

would fill the Atari's screen with syntax error messages, because Atari BASIC lacks such substring manipulators. Instead, the Atari uses a different method of subdividing strings. Assuming that A\$ is 30 characters long, the equivalent statements would be:

```
X$ = A$(1,10)
```

```
X$ = A$(11,20)
```

```
X$ = A$(21,30)
```

while on the Commodore, these same lines would refer to certain elements of two-dimensional string arrays. Looks hopeless, doesn't it?

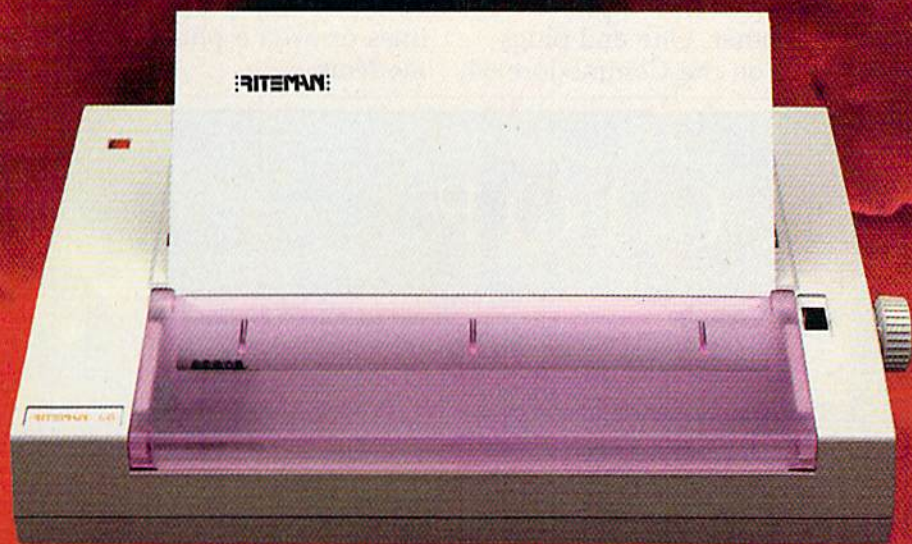
There are other differences between Commodore BASIC and Atari BASIC as well. Usually you can program around them, though. The differences that might give you the most trouble include anything involving memory manipulations, such as sprites and redefined characters, and the built-in graphics commands in Atari BASIC, some of which must be written in machine language on the Commodore 64. Conversely, to simulate the music of the 64's SID chip you'd need machine language on the Atari.

Translating programs from one computer to another requires lots of experimentation and patience. It also helps immensely to have both machines handy. We can't recommend any books specifically written for Atari-to-Commodore BASIC translations because we don't know of any. Our staff programmers are guided by programming reference manuals and memory maps for the various computers they work on.

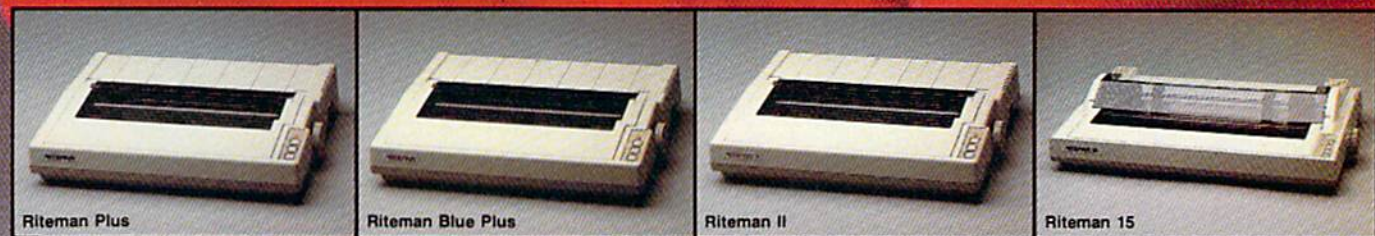
You won't be able to read Atari disks with your Commodore 1541 disk drive, either; the formats are completely different. To save time typing in long programs to be translated, our programmers sometimes transfer the code from one computer to another via modems. Often, however, they don't even attempt a line-by-line

RITEMAN. IT MAKES THE RIGHT IMPRESSION.

Riteman announces LQ—the letter-quality printer that's small enough to hold in one hand. Tiny, super-portable and efficient, LQ weighs less than 7 pounds and costs under \$300. The Riteman LQ. It's the right choice.



Riteman LQ



Riteman Plus

Riteman Blue Plus

Riteman II

Riteman 15

RITEMAN:

INFORUNNER CORPORATION Airport Business Center
431 N. Oak St. Inglewood, CA 90302
(800) 824-3044 (outside Calif.), (800) 421-2551 (In Calif.)

Inforunner proudly announces the three newest members of the family, all plug-compatible with the following computers:
RITEMAN BLUE MAC WITH APPLE MACINTOSH AND II C.
RITEMAN R64 WITH COMMODORE.
RITEMAN R800 WITH ATARI.

*Apple, Macintosh and IIC are registered trademarks of Apple Computer Inc.
**Commodore is a registered trademark of Commodore Business Machine, Inc.
***Atari is a registered trademark of Atari, Inc.

translation—too many changes are required. Instead, they start almost from scratch and write a version that is similar but not identical. That way, the programs can take advantage of each computer's best features.

Q. *I have an IBM PC and a Commodore 64. My IBM has a serial (RS-232C) port. Is it possible to get an RS-232C port for my Commodore 64 and transfer data?*

A. It's possible to transfer data between almost any two computers, but usually some experimentation is required. You might also have to make your own cables or have them made for you.

First of all, the serial port on the rear of a Commodore 64 is *almost* a standard RS-232C port—the only difference is the voltage level. You can convert it by plugging in an RS-232C adapter, available from Commodore and various other companies for less than \$50 (scout the ads in this magazine).

Next, you'll need something called a *null modem cable*. This is just a simple cable that fools a pair of computers into thinking they're linked up over the phone lines with modems. A few wires are crossed so that what's an input line on one side is output at the other. One end plugs into the RS-232C adapter on the Commodore 64,

and the other end plugs into the IBM PC serial port. Null modem cables are available from several manufacturers, although you might have trouble finding one with exactly the plug connectors you need.

Finally, each computer will have to be running its own *terminal software*, a program designed for telecommunications with a modem. The terminal software must be set up to recognize a modem plugged into the serial port. Of course, there won't really be any modems attached—only the null modem cable. When everything is hooked up, you use the terminal software (which must have upload/download capability) to transfer the file from one computer to the other.

The whole process can get much more complicated than it sounds. Besides acquiring the proper cables and plugs, you have to make sure the computers are sending and receiving at the same rate, that the telecommunications parameters are properly adjusted, and other things. We've successfully used null modem cables to transfer files between an Atari, IBM PC, TI-99/4A, and TRS-80 Color Computer, but it took some work. If you already have a modem and terminal program for each computer, it might be easier to simply transfer the files over the phone lines or even a phone cord connecting the two modems.

DI-SECTOR

Version 2.0

**EVERYTHING YOU EVER WANTED IN A DISK UTILITY... AND MORE!!
FOR THE COMMODORE 64***

- ★ Fully automatic back-up of almost any protected disk.
- ★ Copy files [PRG, SEQ, RND] with full screen editing.
- ★ Three minute back-up of standard disks [even many protected disks].
- ★ Format a disk in ten seconds.
- ★ View and alter sector headers.
- ★ Remove errors from any track/sector.
- ★ Edit sectors in HEX, ASCII — even assembler.
- ★ Create errors on any track/sector [20, 21, 22, 23, 27, 29] instantly.
- ★ Drive/64 MON, even lets you write programs inside your 1541.
- ★ All features are fully documented and easy to use.
- ★ None of our copy routines ever makes the drive head "kick."

Yes, you get all of this on one disk for this low price!

\$39.95

WRITE OR PHONE . . .
STARPOINT SOFTWARE

Star Route 10

Gazelle, CA 96034

[916] 435-2371

VISA or
MASTERCARD

add \$3 for C.O.D.

*Commodore 64 is a
registered trademark of
Commodore Business Machines

MUSICAL CHRISTMAS



SEND YOUR FRIENDS THE LATEST
IN COMPUTERIZED GREETINGS

- For The Commodore-64
- Fully Personalized For Your Family Or Business Use
- Ten Christmas Carols, Each With Its Own Full-Color Bit-Mapped Graphic Scene.

Master Disc - \$24.95

Ten Blank Discs
(With Mailers) - \$29.95

(California residents add 6% for sales tax.)

Be sure to include all needed personalization information, such as family member's names.

ORION ENTERPRISES

10221 Slater Ave., Suite # 103
Fountain Valley, CA 92708

MICROSCI SHOWS COMMODORE 64 OWNERS HOW TO GET DOWN TO BUSINESS.



Good news for people tired of playing games.

INSTA home business software from Microsci.

Designed exclusively for your Commodore 64™, the INSTA library lets you run home business programs like the Insta-Writer word processor, Insta-Calc spreadsheet, Insta-File data base manager and much more.

So you can write, organize, file, graph, calculate.

INSTA home business software from Microsci.

Because there's more to your Commodore 64 than just fun and games.

For more information, call or write Microsci at 2158 South Hathaway Street, Santa Ana, California 92705. (714) 241-5600, Telex 910-346-6739.

Commodore 64 is a trademark of Commodore Business Machines, Inc.



© 1984, Microsci, Inc.

FINALLY, YOUR COMPUTER CAN DO WHAT YOU TELL IT.

Now anyone can use a computer.



Now everyone will use their computer more.

Revolutionary Chirpee™ lets you command your computer by voice.

Why touch your computer when you can talk to it. Chirpee, the most exciting peripheral development of the decade, makes it easy and completely affordable for you to turn your computer into the full-function tool it was intended to be. Thanks to a revolutionary phonetic-based design, you can train Chirpee in any language to understand your voice or several voices. Use Chirpee's demonstration software to create your own programs with voice commands. Free your hands and your mind. You'll have more time to think, more time to program.

Chirpee adds a whole new dimension to your computer. It's the one peripheral that can make your system truly friendly.

Instruction book, plus 6 comprehensive disk software programs included. More being developed by major software manufacturers.

- SOS—Speech Operating System contains all training, use and file handling routines needed to generate basic Chirpee system
- CHIRPEE—the heart of all functional software applications. Allows everybody to use Chirpee for software applications.
- SPEECH GRAPHICS—displays each phonetic utterance on colorful X-Y plot

- AERONAUT—exciting game allows participants to drive hot-air balloon over mountainous terrain with five command words
- CARD FILE—personal filing system for home or business programs. Allows storage, recall or printing of typed memos
- WORD MIX—a word matching game that shows beginning programmers how Chirpee is used in a BASIC program

ENG MFG., INC.
4304 W. Saturn Way
Chandler, AZ 85224
Phone 602/961-0165



Suggested Retail \$179⁹⁵

Call toll-free 1-800-431-3331 or 602-431-0400 for dealer location nearest you.

Byron Preiss And Ronald Martinez

Trillium Software Designers

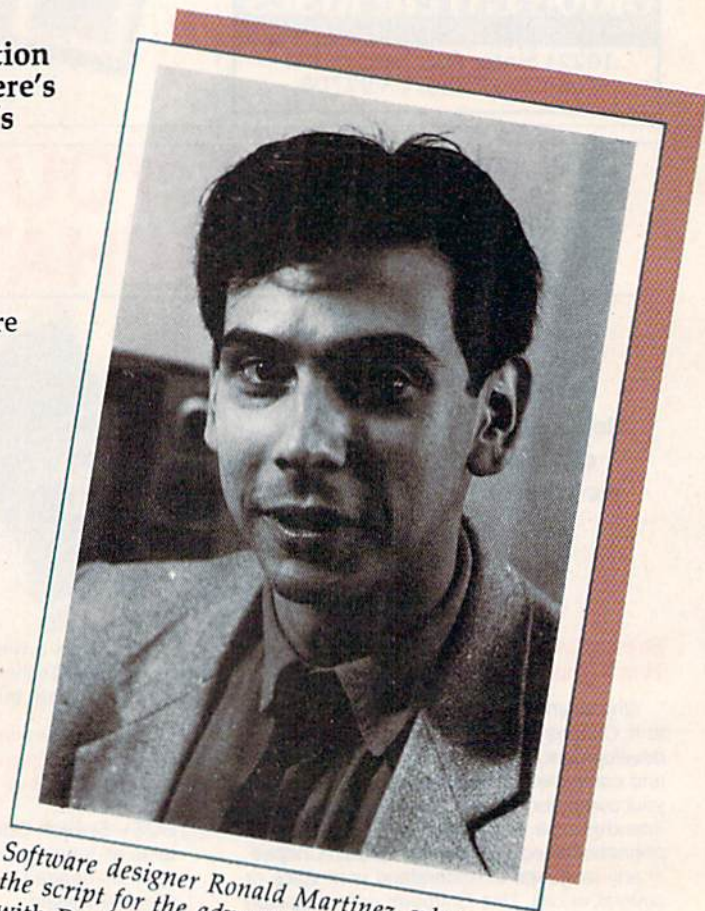
Sharon Darling, Research Assistant

How do you go about translating science fiction and fantasy novels into computer games? Here's how two of the designers behind Spinnaker's new Trillium series did just that.

Computer games were originally little more than fast-moving action shoot-'em-up's or text adventures with severely limited vocabularies. But programmers have begun to advance the sophistication and the interaction of all types of computer games. The next generation of games has arrived—science fiction and fantasy novels turned into graphics text adventures.

Among the leaders in this new genre is Spinnaker Software, which this fall released the first entries in its Trillium series for the Commodore 64 and Apple II computers. Trillium includes adaptations of such novels as the classic *Fahrenheit 451* by Ray Bradbury, *Rendezvous with Rama* by science fiction master Arthur C. Clarke, and *Dragonworld*, a fantasy by Byron Preiss, Michael Reaves, and Joseph Zucker.

Also available are *Amazon*, an adventure tale developed by author Michael Crichton, a video version of Robert A. Heinlein's *Starman Jones*, and *Shadowkeep* from Alan Dean Foster. The Commodore versions sell for \$32.95 each, while the Apple versions cost \$39.95.



Software designer Ronald Martinez, who wrote the script for the adventure *Rendezvous with Rama*.



Science fiction writer Arthur C. Clarke, left, studies the software version of his novel *Rendezvous with Rama*, while Byron Preiss and David M. Harris, who worked on the adaptation, look on.

Between them, the authors involved with the series have 100 million books in print, according to Seth Godin, Trillium project manager. Other authors whose works are scheduled to be adapted include Harry Harrison and Roger Zelazny.

How do you go about turning a novel into a computer game? "The key point is having a dialogue with the author," says Byron Preiss, whose company, Byron Preiss Video Productions, developed four of the releases in the Trillium series. "For example, in *Fahrenheit 451*, it meant sitting down with Ray Bradbury and saying, 'All right, this is a medium that's totally different from a film, and it's totally different from a book.'

"It doesn't have some of the advantages of a film, but it

does have flexibility. In other words, a character is able to take different actions, whereas in a book you can only do one thing."

In addition to *Fahrenheit*, Preiss's company did the adaptations for *Rendezvous with Rama*, *Dragonworld*, and *Starman Jones*. Preiss is also working on another software line for Spinnaker, the Windham Classics, turning such literary favorites as *Wind in the Willows*, *Treasure Island*, and *20,000 Leagues Under the Sea* into interactive fiction.

From *Fahrenheit 451*: The time is not too long from now. The place is New York City.... This is a world where simply owning a book is dangerously illegal.... You, Guy Montag, are a rebel fireman with a passion for books—the most wanted fugitive in the country.... Your mission: To restore to the world the freedom it once had.

"The adventure game market has been pretty much the same since 1976, when the first adventure game came out," says Godin. "That is, they've been puzzle-based games, be they text or graphics—they've always been based on a series of logic puzzles.

"We're trying to make a game that is based on plot and characterization, not puzzles—the way a book is. If you read *Fahrenheit 451*, you don't get stuck on page 50. And if you play the game, you don't get stuck on frame 50, because the whole idea is that you're interested in the game because of the characters and the plot and what's happening. You care about what's going on."

But what are these new adventures—games, interactive fiction, or books? To Ronald Martinez, who wrote the script for *Rendezvous with Rama*, "That's the dilemma with this medium—it's very difficult to put a name to it because it's like the classic instance of describing a color that no one's ever seen before."

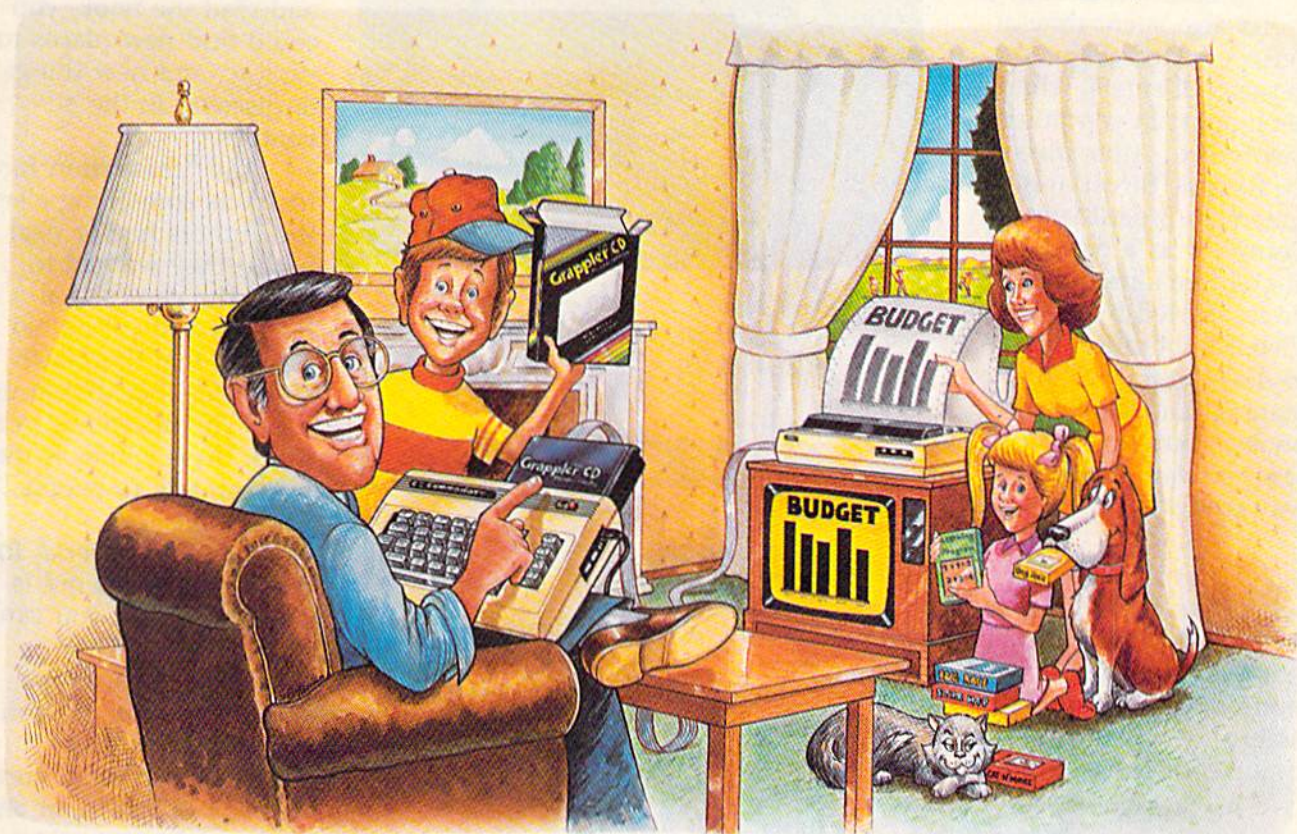
Preiss and Martinez both like the term *electronic book*. That phrase "is the best at the moment, because you read it," Preiss says. "It's a reading medium."

Both authors are now doing something that ten years ago was beyond their imagination: working with personal computers. Neither one majored in computer science in college—"there was no such major" at the time, the 31-year-old Preiss recalls.

The New York native went to the University of Pennsylvania, where he earned degrees in communications and urban studies. He then did graduate work in film at Stanford.

"I guess from the time I was a kid in school, I was interested in science fiction and electronic media. I think almost everyone from our generation

"Now Your Commodore 64™ Can Print Like a Pro!"



GrapplerTM CD Printer Interface

The Revolutionary Printer Interface for the Commodore 64™

A New Era in Commodore Printing Power.

Grappler CD offers the first complete answer to your printer interfacing requirements, with many powerful capabilities unique in the Commodore marketplace. Complete signal translation allows many popular name brand printers to operate perfectly with the Commodore 64, or to imitate Commodore's own printer. Even Commodore's graphic character set can be reproduced on Epson, Okidata, Star, ProWriter and other popular printers.

Exclusive Grappler CD features provide a variety of graphic screen dumps, text screen dumps and formatting. No other Commodore interface can offer this.

If you own a Commodore 64...

If you're serious about quality, trouble free printing... You need the Grappler CD.

Contact your nearest Commodore dealer or call Orange Micro for a dealer near you.

A Uniquely Intelligent Interface:

- Prints Screen Graphics Without Software
- Graphics Screen Dump Routines Include Rotated, Inversed, Enhanced and Double Sized Graphics.
- Full Code Translation From Commodore's PET ASCII to Standard ASCII, the Language of Most Printers.
- Complete Emulation of the Commodore 1525 Printer for printing of Commodore's Special Characters.
- Dip Switch Printer Selection for Epson, Star, Okidata, ProWriter and other popular printers.
- Conversion Mode for Easy Reading of Special Commodore Codes.
- Text Screen Dump and Formatting Commands
- 22 Unique Text and Graphics Commands



1400 N. LAKEVIEW AVE., ANAHEIM, CA 92807 U.S.A.
(714) 779-2772 TELEX: 183511CSMA

was," he says. "We grew up with television sitting in our laps, so that was a natural interest."

In addition to college, Preiss also spent time at Xerox's PARC (Palo Alto Research Center), where his interest in computers was fueled. After working for Sesame Street and the American Broadcasting Company as a designer of children's programming, Preiss started Byron Preiss Visual Publications in 1979 to develop television material and publish books, "but we quickly saw software as the best way to teach."

From *Rendezvous with Rama*: The year is 2130, and a huge new asteroid has just been discovered and named: Rama.... But this is no asteroid—Rama is actually a mammoth spaceship.

As fate has it, only one of Earth's ships is close enough to Rama to meet it—and it is the ship you command.... Your orders: *Rendezvous with the ship, explore it, find its creators, and return home—if you can.*

Ronald Martinez is also a New York native, and he, like Preiss, is 31. His interest in science fiction dates from the second grade, when he read his first science fiction book, *Great Stories of Space Travel*.

Science fiction "was really like something I had never imagined to exist, and I had the same feeling when I started to work with the computer, which was through Byron," he adds.

Martinez went to college at Stony Brook University on Long Island, where he earned a degree in English. He later wrote interactive children's fiction for Visual Publications. Preiss then approached him about doing the



The fantasy adventure *Dragonworld*, was adopted for Spinnaker's Trillium series from the book of the same name.

adaptation for *Rendezvous with Rama*.

Nearly all of their waking hours are now spent working with computers—IBMs, Apples, Commodores, and Ataris for Preiss, IBMs and Ataris for Martinez.

Preiss's interest in computers and books led him to approach Spinnaker about creating interactive fiction. His firm had already published works by both Bradbury and Clarke, and "partly out of that relationship with them, we were able to take the first steps toward doing this project."

Turning novels into computer adventures means keeping the quality of the story intact. "I think the challenge which we met in all the games was to come up with things that amplify the book, and are faithful to it," says Preiss. "For example, what Ron conceived for exploring the inside of the *Rendezvous'* alien ship is faithful to all of Clarke's ideas, yet it's more than the book."

Martinez says, "The means of moving about in the ship, for example, have been enhanced

so that you can get into places in the Rama structure which you wouldn't be able to get into in the book version. So if you had read the book, you could find new places to explore, and new things to discover in the adventure."

The "frustration factor" was something else the authors had to deal with—they wanted to make the games challenging, and yet not so difficult that the player would feel like giving up.

"The difference in a lot of these games is that you can talk to people," Preiss says.

"In *Dragonworld*, for example, Hawkwind is your companion, and you can have a dialogue with him to get help. In *Rendezvous*, you can communicate back to your crew, and Ron set it up so you've got three different crew members, any of which, at any given time, might give you a different piece of information."

While the puzzles are there, Martinez says, "they're not the whole point. The point is, you're in this world, and it's a story that unfolds. We never sacrifice dramatic progress for the sake of a kind of deep puzzle that you might spend two weeks on."

In the Trillium series, graphics play an integral part in the game, says Martinez. "I think a lot of adventures have used graphics which tended to be kind of superfluous because the text really covers what's there, and it's kind of nice to see the picture, but not necessary."

"In this case, a lot of the graphics are really your only kind of clue or direct link to a part of the story. So what you see there really affects what you do."

64 more things you can organize with your Commodore 64.

PFS:FILE and PFS:REPORT are now available for your Commodore 64. With electronic filing software this powerful, you can organize your life in hundreds of ways. PFS: Software makes it easy.

1. You can track your real estate.
2. List your wines.
3. Prepare your invoices.
4. Make mailing labels.
5. Chronicle your magazines.
6. Manage your inventory.
7. Record your checks.
8. Organize a fund raiser.
9. Manage your stocks.
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.
© Software Publishing Corporation.



Comparisons between Trillium and such interactive fiction heavyweights as those from Infocom are perhaps inevitable. But to Preiss and Martinez, Trillium stacks up favorably with all-text adventures.

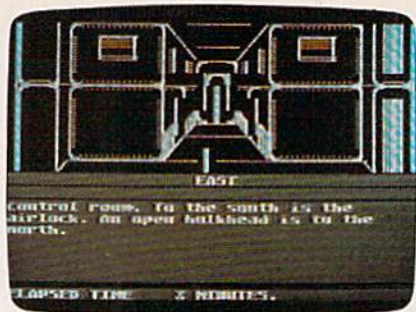
"I think Infocom has set the standard for text input, and most of the time that you buy a graphics adventure, or any kind of unusual adventure, you see those standards going by the wayside," Preiss says. "I think what Trillium has tried to do is keep the standards of the high quality text adventure consistent and at the same time, put in the things that really make use of the computer."

For those who prefer their own imagination to an artist's conceptions, however, Preiss has added the option of playing the games without the graphics.

Sophisticated language is another extra for Trillium, Martinez feels. "It's more sophisticated than any other graphics adventure that I've seen. And the sentences that are understood by the computer, by the program, are full natural language sentences."

Martinez and Preiss were not alone in coming up with their adaptations—Clarke, Bradbury, and Heinlein worked directly with them in converting their works into electronic books. In addition, up to 12 people were involved in the process of developing each game. And in the case of *Rendezvous with Rama*, architects were hired to design the interior of the alien ship.

From Amazon: You've just been hired by NSRT, a top-secret, high-tech research firm. You knew your work wouldn't be easy—but you weren't expecting your first assignment to be a solo expedition to one of the most dangerous, most unexplored areas on Earth.

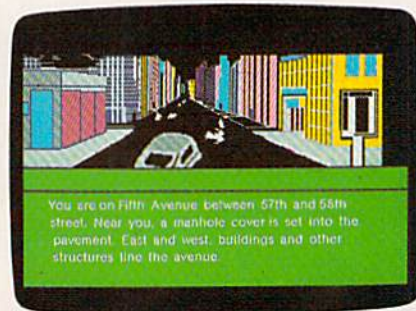


In Rendezvous with Rama you and your crew must explore a giant spaceship.

Nevertheless, you're on your way to the Amazon, on a mission whose purpose is secret and whose dangers are deadly.

The collaboration with Arthur C. Clarke "was a unique case because almost all the work, except for two meetings, was done via mail and the phone," with Clarke responding from his home in Sri Lanka, Preiss says.

Some responses came in a rather unorthodox way, however—via space satellite. "He has been working with the director of 2010 (sequel to the movie based on Clarke's 2001: A Space Odyssey), and they're online via space satellite," Preiss says.



Ray Bradbury's Fahrenheit 451 is another entry in Spinnaker's Trillium series.

But communicating via satellite is nothing new for Clarke, who was the first to propose the idea of geosynchronous satellites, in a story published decades ago. He has also delivered book manuscripts electronically from Sri Lanka to New York.

"In the course of working on the game, he would often send us messages on the computer that someone would call up and dictate. Ron came up with a very clever way to do some things differently from the book, and any time that would happen, we would want to get approval from Arthur. It would often come in the way of 'tell them it's OK,' via satellite."

Working with Bradbury was a pleasure, Preiss says. "He brings the enthusiasm of a young boy—unbelievable, unbounded enthusiasm for something new."

For the adaptation of *Dragonworld*, Preiss, who co-wrote the book, worked with fellow author Michael Reaves to come up with the game of the same name.

Neither Martinez nor Preiss take much stock in the argument that good authors don't necessarily know what makes a good computer game.

"That's why they're not working alone. I think the idea here was to take talented writers and put them together," says Preiss.

In Martinez's view, "I think a great writer would definitely have created the elements for a good game, in that a well-written book has within it a plausible universe, and that's what we're engaged in here, constructing plausible universes."

For the future of electronic books, the two authors see no limits. Says Martinez, "Marrying the technology with the artistic impulse is a good way to create something that hasn't been seen before—there are no limitations." ☐

We've Got People Talking

REVIEWERS SAY:

"This is the best typing tutor we have seen yet; ★★★★★"
INFO-64

"Computer aided instruction at its best."
Commander

"This is an excellent program that makes typing practice an enjoyable pastime instead of boring drudgery."
DILITHIUM PRESS

Rated the BEST educational program for the VIC 20
Creative Computing



CUSTOMERS SAY:

"... delighted with my son's progress ... he is the only one in his second grade class who touch types at the computer."

"Your Typing Tutor is an excellent program ... our 4 children literally wait in line to use it."

"Thoroughly satisfied, can't believe how fast I've learned to type. I've never typed before."

In daily use by schools across the USA.

TYPING TUTOR + WORD INVADERS

Commodore 64™ Tape \$21.95

Commodore 64™ Disk \$24.95

VIC 20™ (unexpanded) Tape \$21.95

REALISTIC AIRCRAFT RESPONSE

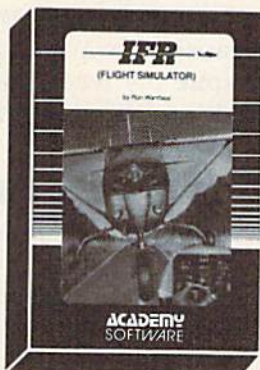
"Has a quality of realism which sets it apart from others, even those I've tested in flight school."
Compute's Gazette

"Great program!" INFO-64

"It is tremendous fun."
Compute's Gazette

"Flight tested by an air traffic controller, two skilled pilots and an elementary school class. Highly recommended by all."
Midnite Gazette

"This is an unbelievably realistic simulation of the difficulties facing a pilot in instrument flying. I'm a 747 pilot and I think that this simulation could do a lot to improve the reactions and instrument scan habits of even very experienced pilots."
747 pilot



IFR (FLIGHT SIMULATOR)

Commodore 64™ Tape or Disk \$29.95

VIC 20™ (unexpanded) Cartridge \$39.95

JOYSTICK REQUIRED

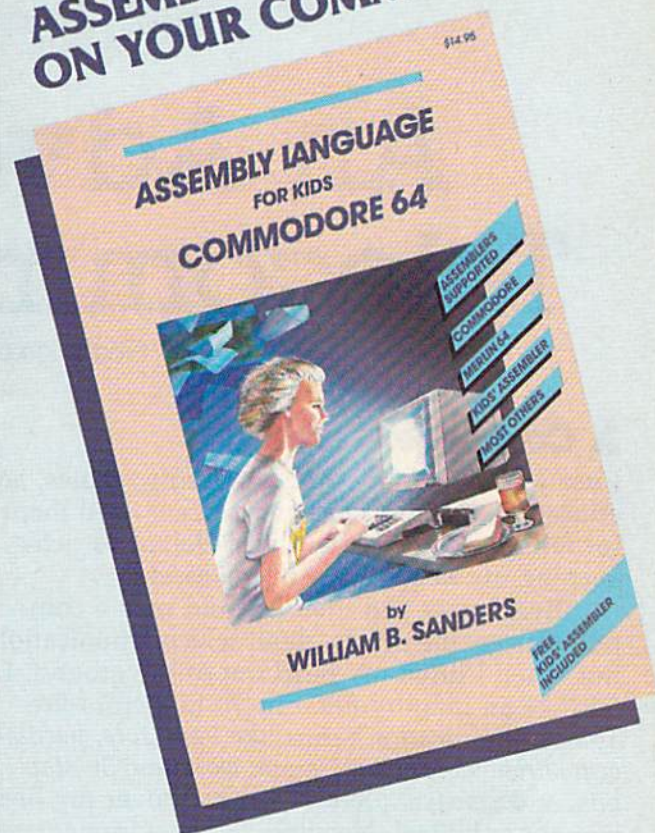
Shipping and handling \$1.00 per order. CA residents add 6% tax.

ACADEMY SOFTWARE

P.O. Box 6277 San Rafael, CA 94903 (415) 499-0850

Programmers: Write to our New Program Manager concerning any exceptional Commodore 64 program you have developed.

LEARN ASSEMBLY LANGUAGE ON YOUR COMMODORE 64



Why be someone who just plays computer games when you can be the one who writes their own impressive machine language programs?

LEARN

How to Use Assemblers

- Commodore 64 Macro Assembler Development System
- Merlin 64 Assembler
- Kids' Assembler (INCLUDED in book)
- Most Others

How to Write Assembly Language Programs

- Designed for Beginners
- Step-by-Step Instructions
- Lots of Example Programs
- Specifically for Commodore-64

Pick up your copy today at computer stores and book stores everywhere, or order direct: Send check or money order for \$14.95 (California residents add 6% sales tax).

microcomscribe

8982 Stimson Court, San Diego, California 92129
(619) 484-3884 or (619) 578-4588

COMPUTING for families

An Adventure In Telecommunications

Fred D'Ignazio, Associate Editor

A Computer Ostrich

I use computers for word processing, games, and education, but until recently I never used them for telecommunications. I was like an ostrich—keeping my head firmly in the sand.

Every now and then I would read a computer magazine article about telecommunications. But when I lifted my head out of the ground, I felt like an infantryman caught in a cross-fire. Telecommunication terms like *baud rate*, *parity*, *asynchronous communication*, *word length*, *stop bits*, and *xmodem protocol* whizzed over my head like angry bullets. Needless to say, I immediately stuck my head back into the hole in the ground. I figured it was safer there.

Then one day last summer I attended the CES (Consumer Electronics Show) in Chicago. I was walking by the Prentice-Hall Software booth and ran into Ken Skier. I remembered Ken as the author of *SkiWriter*, a word processing package for the Epson HX-20, the tiny lap-sized computer with only a few thousand bytes of total memory. Now Ken was all fired up about a new word processing program he had written for the Commodore 64 called *SkiWriter II*.

This new word processor comes on a 16K memory cartridge that plugs into the back of the 64, and costs \$69.95. You can learn more about *SkiWriter II* by contacting:

Prentice-Hall Home Software
P.O. Box 819
Englewood Cliffs, NJ 07632
(201) 592-2611

To Ken, 16K is a lot of memory, and he had no trouble at all fitting a powerful word processing program into the cartridge.

But that's not all he put into the cartridge. He had so much space left after he wrote the word processor that he decided to add a telecommunications program, too. So *SkiWriter II* for

the 64 is not just a word processor, it's a *communicating* word processor.

There is a precedent for this idea on the little, notebook-sized computers like the Model 100 from Radio Shack and the NEC 8201. These little computers have a telecommunications program and a word processor built into the circuits when you bring them home from the store. The programs are separate (unlike the *SkiWriter II*), but they are so easy to use, it's like they're really the same program.

When Ken showed me *SkiWriter II* at CES, he asked me to sit down and try it out. I hate trying new programs out in front of other people, because I always end up doing foolish things. Despite my reservations, I sat down at the computer and began typing.

One-Touch Functions

The first thing I noticed was the plastic overlay that fit around the 64 keyboard. There were 21 functions assigned to special keys on the keyboard, but the functions were all simple like FIND, REPLACE, TOP, BOTTOM, CANCEL, and EXECUTE, and they were written in big, bold letters. This didn't look too hard. Maybe I wouldn't look like a fool after all.

Next we plugged in the cartridge and turned on the computer. On the screen a menu appeared with an arrow pointing to the top item:

```
→ Edit
  Preview
  Print
  Use Cassette
  Use Disk
  Use Modem
  Select Colors
  Delete the Document
```

I pressed the arrow keys on the 64 and made the menu (not the arrow) move up and

Why do you think they call it a picture tube?

Because it's a TV tube. And you watch pictures on TV.

So, is it any wonder that you're disappointed with an expensive computer that shows you nothing but words? That sort of suggests you might want to go home, turn on the set and *read* the Love Boat.

your powerful commands to run Homeword™, the remarkable new home word processor.

So, other than a few keys to move you around the screen, all you need to remember is nothing.

If you don't think pictures work better than words, consider some of life's most urgent communications.

It's no accident that pictures have replaced words wherever people need information fast. So why shouldn't you have the same advantage in your home

word processor?

That's why *Family Computing Magazine* calls Homeword™, "...a program of unbelievable simplicity. And its performance has not been sacrificed to its ease of use." You can't argue with that!

Just how fast do pictures work? HOMEWORD™

It became the #1 home word processor in just six weeks.

Congratulations. You've just learned 50% of Homeword™.

That's because these two buttons control fifty different pictures. Those pictures are



SIERRA™

Homeword is a trademark of Sierra On-Line, Inc.

HOMWORD™

The Personal Word Processor

Available on the Apple II® Series, Atari Home Computers®, Commodore 64®, and PC compatibles. Suggested retail price: \$69.95.

down, slowly at first, then fast like a bouncing ball. I could have sat there another couple minutes just watching the menu bounce up and down, but I could tell that, behind me, Ken was getting a little bored.

I stopped the bouncing menu at Edit and pressed the EXECUTE button. The screen emptied, and I was ready to begin creating a document.

I created a document easily by letting my fingers go wild. I filled the screen with gobbledygook characters.

"This is neat," I told Ken, "but I can't read the white characters on the blue background very well."

"No problem," Ken said. He showed me how to bail out of Edit (by pressing the CANCEL button) and how to select new text and background colors. I chose black letters on a white background, because it gave me the pleasant illusion that I was using paper and a typewriter rather than a computer and a video screen.

Next, we backed our way into Edit again. I noticed that the computer had remembered the trail we had followed out of Edit, so all I had to do was hit the CANCEL key a couple times. I felt like Hansel or Gretel following bread crumbs through the forest. The computer had remembered my pathway so I couldn't wander off into the forest of unexplored commands.

When we returned to Edit, Ken showed me how to press the different function buttons (all clearly marked with the plastic overlay). We moved blocks of text around, we copied blocks of text, we underlined words—yes, *underlined words right on the screen!*—and we replaced typos with some genuine English, and deleted huge clumps of especially hopeless gobbledygook.

After only about ten minutes of fiddling around with the text, I was zipping around, correcting errors, inserting new sentences and words, and making corrections. After only 15 minutes the whole document was completely spruced up and (to my eyes) error free.

I did have some problems, though. First, as I typed, the overlay tended to move around a little underneath the palms of my hands. This was distracting at first, but I soon got used to it. It didn't slow my typing.

Second, I missed having any commands that would allow me to jump from one end of the line to another, or jump from the beginning of one word to the next, so I could move the cursor even faster along a particular line.

Third, it took me awhile to remember to use the EXECUTE key (f3) instead of the RETURN key to choose items in the *SkiWriter II* menu. (You use the RETURN key, however, when you

are typing your document.)

Fourth, it was hard getting used to using the backspace key as the DELETE LEFT key on the upper lefthand corner of the keyboard instead of its normal place on the upper righthand corner.

However, there were numerous appealing things I found while using the word processor, too. First, the DELETE LEFT key on the left allowed Ken to use the DEL key on the right to let me delete text to the RIGHT (beginning with the cursor). This way, when I wanted to correct a word, I could move in either direction, no matter where I ended up on the word.

This is a great feature for those of us who are somewhat klutzy with their fingers. In my haste to zip around a document in my tiny cursor "airplane," sometimes I come in for a landing on a word and almost miss it. It's great to begin deleting to the right or the left depending on where I have haphazardly landed.

Also, the RETURN character has special status in the word processor and can be edited, so you can use the FIND command and find the RETURN character and replace it or add extra spaces, or whatever. This can be a great help when you need to reformat a document.

And there are lots of nice touches. When you insert text, even at the beginning of a large document, *the whole document* instantly moves down to make room. The paragraph and the whole document automatically and swiftly reformat. There is no wait whatsoever.

Also, the word-wrap happens instantaneously, so you can go typing along and never worry about fitting things on the screen.

And when you want to print your document, you don't have to remember all sorts of esoteric commands to double or triple space the lines, or add headers, or increase the size of your margins. Instead, you just press the EDIT key and the DOT LINE key and step through a menu. As you make your choices, the computer automatically inserts dot formatting commands into the text of your document.

Later on, when you become a more seasoned user, you can bypass this phase by typing the dot commands into your document yourself *in English*. For example, you can type:

`.SPACES = 1`

to single-space the document. And when this gets to be too tedious, you can abbreviate the command to `.S=1`.

Once you are done editing your document, you simply press the CANCEL key to get out of Edit and bounce the menu around until you get to PRINT. And, if you have a printer connected, you just press the PRINT key a second time and your document prints out.

Introducing the **WAVEFORM ColorTone™** KEYBOARD

The Creative Music System

No matter what your musical ability, Waveform's Creative Music System will lead you into a new world of musical enjoyment and education. **The ColorTone Keyboard—Fun And Easy For Children 8 to 80**

With Waveform's ColorTone™ Keyboard, and your Commodore 64™ computer with disk drive, you can make music—and learn about music—as quickly as you can say Do-Re-Mi.

The ColorTone Keyboard comes with software that makes discovering music a simply marvelous and marvelously simple experience. To begin playing you simply touch one of the graphic symbols on the keyboard. Just point to select one of the ColorTone's preset songs, change the musical scale you're playing in or make your Commodore 64 sound like one of eight different instruments.

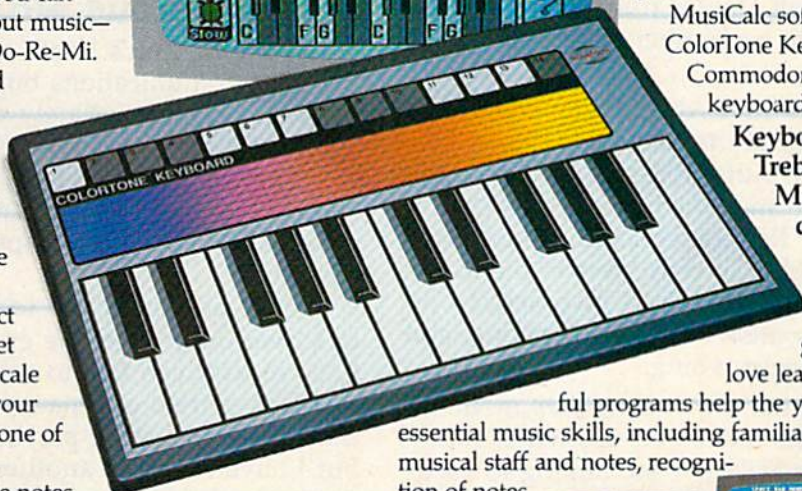
As you play, you'll see the notes you're hearing displayed on a musical staff. That's something no other musical software can do! And with the ColorTone system you can record your musical creations to listen to them again and again.

With Waveform's ColorTone Keyboard, your very first musical experience can be fun and rewarding. Every time you play you'll develop greater musical competence. And confidence.

While you can use the ColorTone Keyboard by itself, it will also add new dimensions to the other software products in Waveform's creative music system.

MusiCalc™—The World's Most Exciting Musical Software

Waveform's MusiCalc™ system includes programs that let you compose, edit and perform your own musical creations using the Commodore 64. You can also turn your



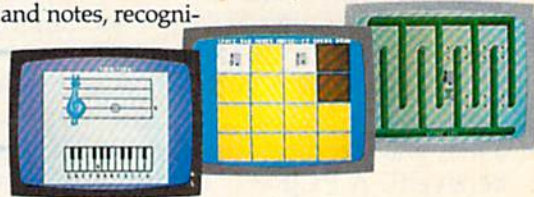
improvisations into musical notation and create your own keyboard scales.

The newest member of the MusiCalc family is the MusiCalc Synthesizer with Sound Teacher.™ With it you can learn all about sound synthesis and then use its performance-oriented synthesizer program to apply what you learn.

MusiCalc software works with the ColorTone Keyboard or with the Commodore 64's typewriter keyboard.

Keyboard Crazy With Treble Clef Cat—Making Music Play For Children 4 Years And Up

This unique software package makes music a game your children will love learning. Four fun, colorful programs help the youngest child develop essential music skills, including familiarity with the musical staff and notes, recognition of notes on the keyboard, and ear training. All in a fun way that'll make your young, potential musicians eager to learn more.



Keyboard Crazy works on the Commodore 64 with or without the ColorTone Keyboard.

Discover the growing family of computerized music products from Waveform and make music play for every member of the family. Look for the ColorTone Keyboard and the entire Creative Music System at a store near you.



waveform

CORPORATION
MAKING MUSIC PLAY

1912 Bonita Way, Berkeley, CA 94704 (415) 841-9866

Saving The Best For Last

SkiWriter II is a fine word processor, but its best feature is how easy it makes using the telephone with your computer.

After I finished typing my document and saving it on disk (with just a couple extra key-strokes—*SkiWriter II* even enables you to format the disk within the program), Ken and I plugged a Commodore Automodem into the 64's user port.

According to Ken, almost any modem that plugs directly into the user port will work, including the Automodem and VICmodem from Commodore and the HesModem from HesWare. Also, acoustic couplers (such as the Lex-11 and Lex-11B from Lexicon) can be plugged into the back of the 64 if they have an RS-232C interface (such as the MFJ-1228 from MFJ in Alabama).

We set the AutoModem's switches to Data (instead of Talk), Originate (to "originate" a phone call), and Full Duplex (the standard setting for micros to talk to each other or to big computers).

Then I pressed the CANCEL key and got the main menu. I bounced the menu to USE MODEM. I selected AutoModem and DIAL, and the computer asked me which number to dial. I typed in a number Ken gave me, and the computer dialed an IBM PCjr right next to me in the booth. The PCjr was running its own version of *SkiWriter*. The PCjr answered the telephone, and waited for me to begin typing.

Ken had me enter the *conversation* mode in *SkiWriter*. This is the mode you use when two computers running *SkiWriter* are talking to each other.

Ken sat down at the PCjr and typed me a message. As he typed it, I saw it appear, letter by letter, and word by word, on my 64. I could hardly believe it. A PCjr was talking to a 64 as easily and casually as if this sort of thing happened every day. And we were talking over the phone line. We were only a couple of feet apart, but we could have been a couple thousand miles apart.

After we sent messages for a few minutes, Ken pressed the f7 key and the words CAPTURE ON appeared on the screen of his PCjr. He had me press the CANCEL key and bounce the menu to upload (transmit) a document. As soon as I did this, my document began zipping across the phone line and appeared on Ken's screen. At the same time it was being stored in the memory of Ken's computer. We watched the numbers whiz by on the screen, showing the memory being used up by the document as it rushed into the computer.

When the document was completely transmitted to Ken's computer, he loaded a document

from his disk and we reversed the process. He selected UPLOAD, and this time I typed DOWNLOAD on my 64, and a moment later the cursor raced across the screen indicating that the document was being transmitted and stored in my computer.

After we were done sending each other documents, I pressed CANCEL, pressed USE AUTOMODEM, and chose HANG UP. My computer hung up the telephone. Ken issued the same commands, and his computer hung up at the other end.

Then I chose Edit on the menu and there was my old document. Underneath, neatly appended to it, was the document I had just received from Ken's computer. Now I could edit the document, change it, delete it, copy it, save it to disk, print it, or send it along the phone wire to some new computer and to another person.

An Ingenious Marriage

After visiting Ken's booth at CES, I was bitten by the telecommunications bug. I returned home to Virginia, and immediately started teaching my 23 computers how to talk on the telephone.


This was no easy task. The truth is, many computers would rather remain isolationist and *never* talk to another computer—or to another person.

But I persisted, and today most of them can talk over the phone. We even have two phone lines so they can talk to each other.

I have tried out many different communications programs since playing with *SkiWriter II*, but I haven't found another communicating word processor. It is convenient to be able to create a document, and in the same breath, send it via electronic mail across the country to a friend, a member of the family, or to a publisher.

Simplicity, convenience, and ease of use are important features for any program that lets you create and send information electronically. Most electronic mail services (like the Source, CompuServe, or MCI Mail) are somewhat picky.

They like documents to be in pure text, or ASCII, format. This is the type of format *SkiWriterII* documents appear in. You don't have to fiddle around with a document after you type it up, you just send it.

And receiving documents is just as simple. You just point to DOWNLOAD or set CAPTURE ON and wait while the document is loaded into your computer. Then you can display the document you're receiving on the screen, and you can go into EDIT, spruce it up, and make it pretty. Then you can print it out or save it to disk. You don't have to fool around with complicated commands or telecommunications jargon. 

The Bear facts:

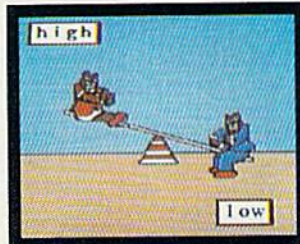
Now, you can get...

- 1 NEW software programs featuring Stickybear™ the hottest-selling computer bear in America.
- 2 Sophisticated color graphics for Commodore 64, Apple® and Atari®, with 48 K.
- 3 New arcade-quality games for families to play together.
- 4 New fun learning programs for 3- to 6-year-olds created by a world-famous children's author.
- 5 Disk, plus hard-cover book* or game,* poster and stickers in a sturdy, attractive vinyl binder – with each program.

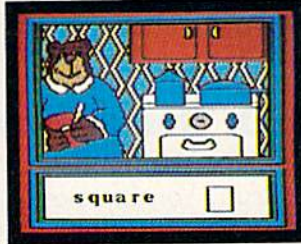


Early Learning (Ages 3 to 6)

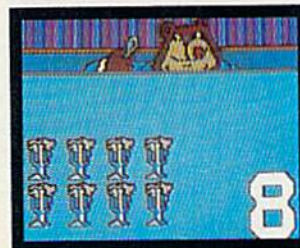
Stickybear Opposites



Stickybear Shapes



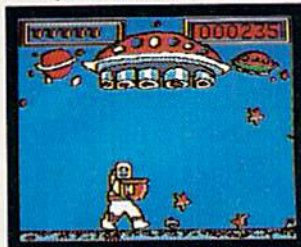
Stickybear ABC



Stickybear Numbers

Games for the family

Stickybear Basketbounce



Stickybear Bop



There's something new for everyone in your family! The playful animation and bubble-gum colors in the educational programs will captivate your youngest. While Stickybear Basketbounce and Stickybear Bop – games of skill and sharp wits – challenge even dedicated arcade games-players.

Look for Stickybear software – developed by

*Apple and Atari only.

Stickybear is a registered trademark of Optimum Resource, Inc. Commodore, Apple, and Atari are registered trademarks of Commodore Electronics, Ltd., Apple Computer, Inc., and Atari, Inc., respectively.

Optimum Resource, Inc. for Weekly Reader Family Software – in finer computer stores everywhere. Or, call toll-free 1-800-852-5000, Dept. AK-6.

Weekly Reader Family Software

A division of Xerox Education Publications
Middletown, CT 06457

Commodore® 64 Owners!
Now Stickybear® Numbers and Stickybear Basketbounce are available for the Commodore 64 with disk drive.

Word Guess

David W. Rose

You'll have to make quick, educated guesses in this word game, which can easily be modified for any age group or learning level. Written for the 64, we've added a version for the expanded (8K or more) VIC.

Based on the Hangman game idea, "Word Guess" offers more of a challenge, and it's a lot more peaceful (nobody gets hung). The object of the game is to guess the letters that comprise a word which is randomly selected from the program's dictionary (found in DATA statements at the end of the program).

A Limited Number Of Guesses

It sounds easy, but there are a few conditions which make it a bit more difficult. You have only five more letter guesses than the length of the word selected. For example, if a ten-letter word (the maximum length of a word in the program dictionary) is chosen, you have a total of 15 guesses. The number of guesses remaining is displayed throughout each game.

Also, to speed the game along, a maximum of 30 seconds is allowed for choosing a letter. A countdown clock shows how many seconds remain to make a choice.

A correct choice is instantly displayed in its appropriate position (or positions), and all letters guessed are displayed for quick reference. A correct answer is rewarded with a congratulatory message and musical fanfare. If you run out of chances, the answer is displayed. In either case, the total elapsed time in minutes and seconds is displayed after each round. You are also prompted to press f3 to quit or f5 to continue on to another word.

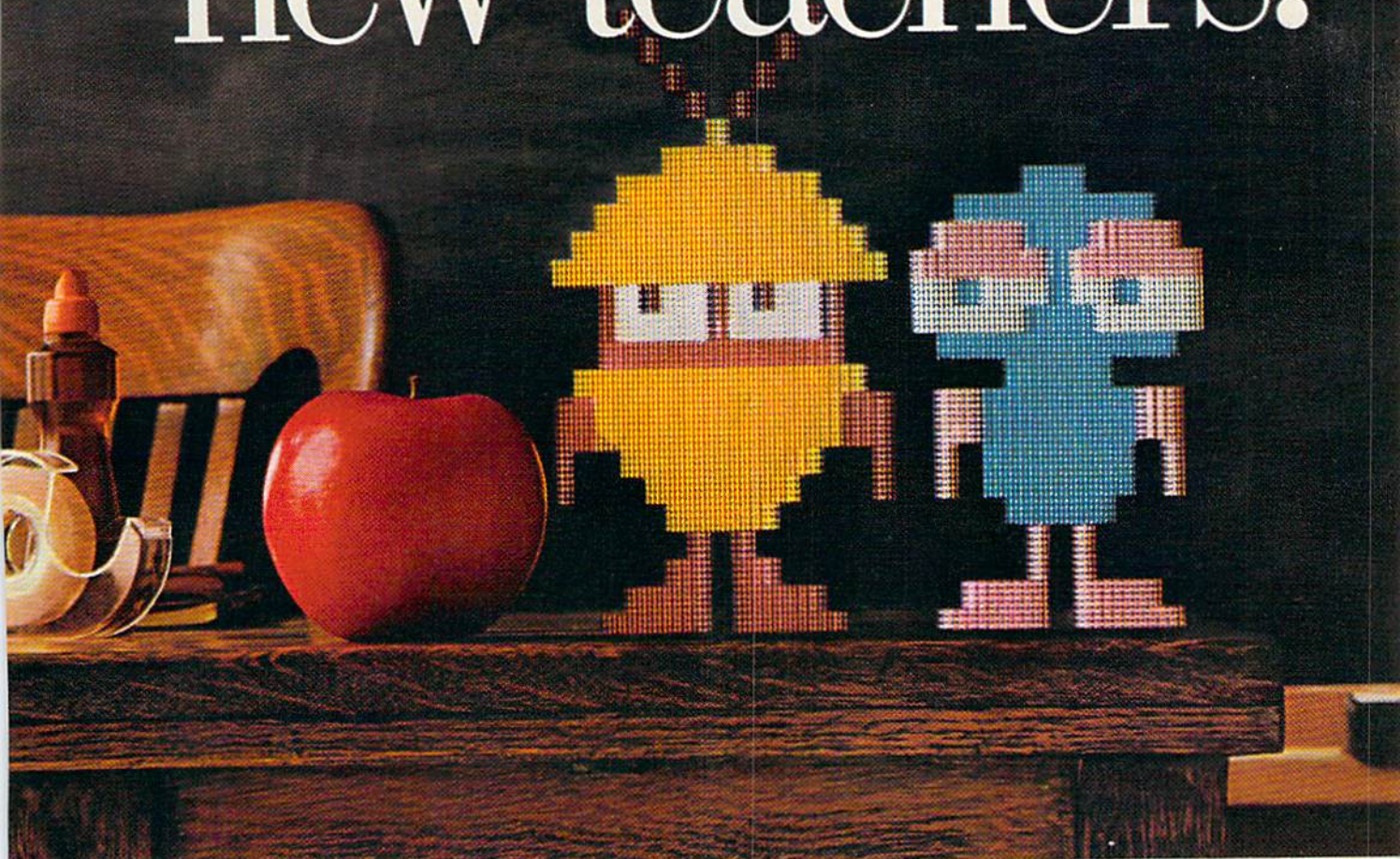
Modifying The Program

Word Guess has 100 words in the program dictionary. None is used more than once in a single game. If you wish to change this number, first change the value of N in line 9. Then change the words in the DATA statements (lines 1000-1100). Be sure the value of N corresponds to the number of words contained in the DATA statements. New words must be from one to ten

VIC And 64 Program Description

Line Number	
9	defines number of words in dictionary (N); time limit (GT)
10	branches to print introduction and instructions
17	defines music POKEs
20	DIMensions the following arrays: LE\$ each letter of word to be guessed MI\$ letters used so far DI\$ correct letters guessed in the word WU marker if word was already used WD\$ all words from dictionary AL\$ alphabet
25	reads words in dictionary to WD\$, sets WU array to 0
26	reads alphabet into AL\$
28	subroutine to clear out arrays for new word
30	picks a random number between 1 and N
35	checks to make sure a word is not repeated in the game
40	marks the word to be used so it is not repeated later
50	finds word length
55	separates letters of the word to be guessed, places letters into LE\$
80	PRINTs message to screen
85-90	define beginning screen locations for word display and underlines
102-104	PRINT messages
106	initial time for guessing word
107	gets initial time in seconds for guessing letter
108	obtains guess
109	if no guess entered yet, activates countdown (if no time left, put '-' for guess)
112	checks if length of answer is equal to one
113	checks if guess is a letter from A to Z
115	increments number of guesses
120	places guess in array of guessed letters (MI\$)
130	checks if letter in the displayed word has already been guessed
140-145	if guess is in word, place it in the appropriate spot, redisplay the word
170-173	determine POKE assignment for letter guessed
177	determines screen location for guessed letter
180	POKEs the guessed letter onto screen
190	PRINTs number of guesses left
215	if there are no guesses left, and the word is not determined, perform routine for missed words
220	if the answer was guessed, perform routine for correct word
225-230	PRINT function key options
235	waits for a response
240	if f5 was pressed, get a new word
245	if f3 was pressed, clear screen and end game

Meet your kid's new teachers.



At first glance, they look like funny creatures right out of a computer game shoot 'em up. But underneath the funny surface, they represent one of the most serious approaches to home education you've ever heard of.

INTRODUCING SPROUT™ SOFTWARE. GAMES THAT TEACH.

These amazing teachers are called Tink and Tonk. They come from Sprout. Software for kids 4 to 8.

The beauty of Sprout is how we balance entertainment with a healthy dose of education.

While kids are having fun at home, they're reinforcing what they've learned at school. Things like the alphabet, spell-

ing, vocabulary, counting, adding, and pattern recognition.

You'll also like how Sprout prevents boredom. Our games grow up, instead of wear out. As kids get older, the game gets harder—with many variations and many decisions to make.

Sprout didn't learn how to do all this overnight. You see, we've got a hundred years of experience to lean on. (Our parent company is SFN, the country's #1 textbook publisher for

elementary and high schools.)

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

So let TINK!TONK!™ software teach your kids. And when they play at the computer, they won't be playing around. They'll be learning something.



Compatible with Atari®, Commodore®, Apple®, and IBM®

sprout
Games that grow up.
Instead of wear out.


Subroutines

300-390	countdown clock for guessed letters
500-540	clear arrays for new word
600-655	display current letter being guessed
620	determines POKE for letter
625	determines screen location for display
630	POKEs the letter onto screen
635-645	sound beep for letter guessed
650	time delay for multiple occurrences of the same letter in the word
700-730	PRINT message for missed word
705-710	print message and the word missed
715-725	sound buzz
800-850	PRINT congratulations for guessed word
810	PRINT message
815-835	sound fanfare for correct guess
875-975	PRINT introduction and instructions
875-897	print introduction
900-956	print instructions
1000-1999	dictionary of words
2000-2010	alphabet

characters in length, and no special characters or numbers may be used. By following these simple rules, it's easy to modify the game for children or even serious word buffs.

You may also change the 30-second time limit by assigning a new value to the variable GT, also in line 9.

To make the game more difficult, add GOTO160 at the end of line 140. This forces the player to guess each letter even if the selected word has more than one occurrence of that letter. For example, if the selected word is "gallon," the player must guess "l" twice to get the correct answer.

See program listings on page 201. 

Advertise your program or product for the VIC-20 or 64 here and reach hundreds of thousands of readers.

Wizard of ease.

Easy user.

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.

Easy writer.

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®

Datasoft, Inc., 19808 Nordhoff Place,
Chatsworth, CA 91311 • (818) 701-5161

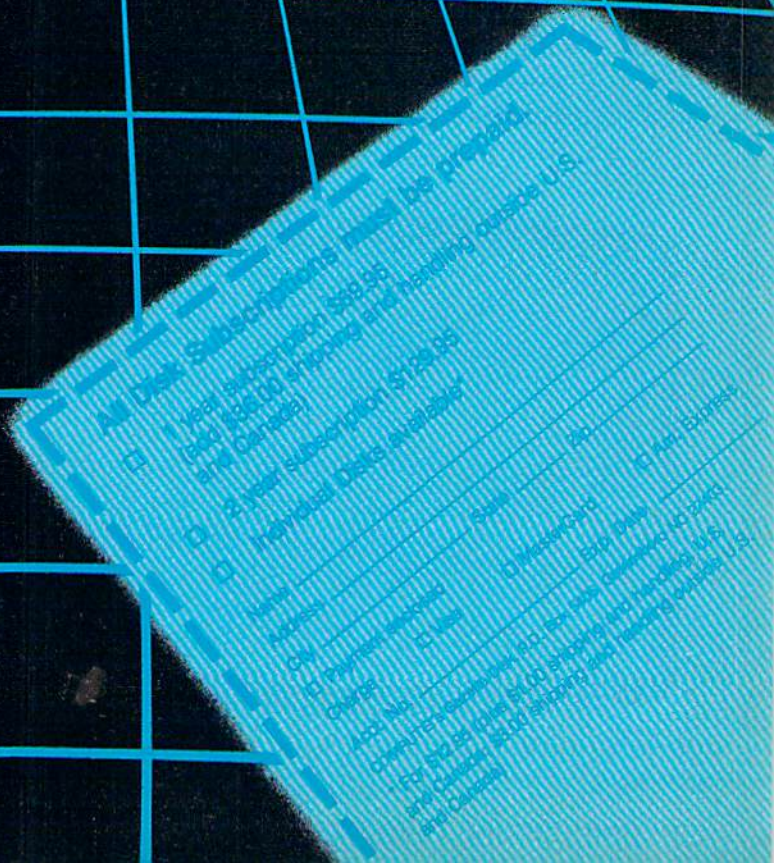
COMPUTE!'s GAZETTE DISK!



Get more out of your Commodore computer.

Start your subscription to *COMPUTE!'s Gazette Disk*. Each month you can receive a fully tested 5 1/4" floppy disk to run on either your Commodore 64 or VIC-20 personal computer. Each issue of *COMPUTE!'s Gazette Disk* will contain all the programs appearing in the corresponding issue of *COMPUTE!'s Gazette* magazine. So, now you can have all the quality programs found in each month's *COMPUTE!'s Gazette* ready-to-load on a disk. Send in the attached coupon and subscribe today!

Call toll-free **1-800-334-0868**
or send your prepaid coupon to:
COMPUTE!'s Gazette Disk
P.O. Box 5406
Greensboro, NC 27403



Letter Attack

Craig Howarth

Keep your typing skills from going down the "chute" with "Letter Attack." Originally written for the VIC, we've added a version for the 64.

This program puts your typing skills to the test. It measures response time and accuracy and provides entertainment as well.

The rules of play are quiet simple. A letter falls down the chute from the top of the screen at varying speeds (depending on the skill level chosen). You must press that letter on the keyboard before it reaches the bottom of the screen. If you enter the wrong letter, you can keep trying until the letter vanishes from the screen.

The Play Screen

The skill level, letters remaining, current score, and high score are displayed during play. In

addition to these, a green pointer appears on the right side of the chute every time a letter is properly entered. This shows how quickly you are responding during the course of play. The higher the pointer the faster your response time.

On the left side of the chute, starting with the second round of play, a purple pointer indicates your best response time so far.

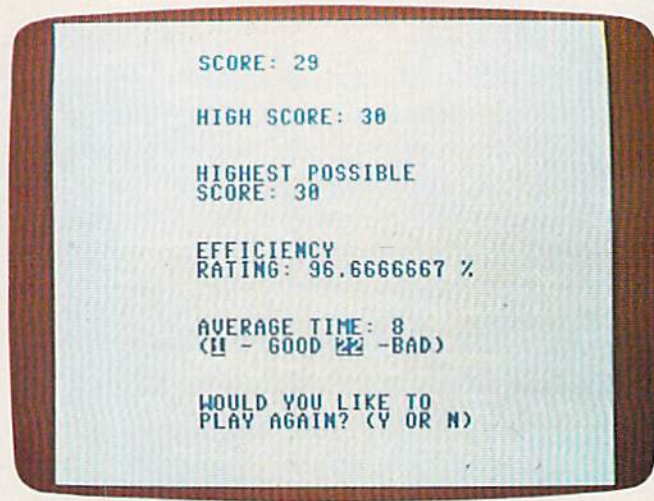
The Score Screen

Once all of the letters are eliminated (the number of letters is chosen at the beginning of play, 10-90 in increments of 10), a new screen is displayed showing the results of the most recent game. Along with the score, the highest possible score (number of letters), and the high score, is an efficiency rating which is the percentage of the score against the highest possible score.

There is also an average time displayed, determined by dividing the total of all times for



A letter is caught and marked by an arrow in the VIC version.



Each performance is rated at game's end (64 version).

Inside every kid there are great adventures to be told.



With Playwriter™ and your computer, now you can write your own great adventure books.

Write the adventures you've always dreamed of. And turn those dreams into illustrated books, with Playwriter Software from Woodbury.

Playwriter is the first software package that lets you write, edit, illustrate, print and bind your own books using your IBM, Commodore 64, or Apple home computer.

Live the adventure as you write it

You can travel through space and time. And go where no one has gone before—to the center of your imagination. Because Playwriter helps you create the heroes, villains and other characters in your story and lets you decide every twist and turn of the plot.

Playwriter guides you through the creative process by asking you questions about the story you want to write.

Playwriter responds to everything you tell it. And you'll see your answers turn into action as the story develops.

Built-in word processor

Playwriter's simple-to-use word processor lets you go back to fix or change any part of the story you like.

Next, just print out the story and put the book together using the hardcover jacket, colorful stickers, and full page illustrations included in each package.

When you're finished, you'll have a real book including a title page, dedication page and a page all about the author, you!

Use it again

With Playwriter you can create a whole library of books written by you. Best of all, you'll have hours of fun long after the computer is shut off.

Apple, Commodore and IBM are all registered trademarks.



WOODBURY Software For Success!

15 Prospect Street, Paramus, New Jersey 07652 (201) 368-1040

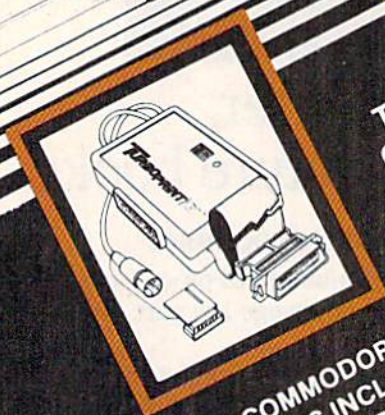
NEW FOR
COMMODORE 64

TURBOPRINT/GT

HIGH PERFORMANCE PRINTER INTERFACE
WITH OPTIONAL 16K or 32K TURBOBUFFER



THERE IS NO
COMPETITION



PRINTS ENHANCED COMMODORE GRAPHICS •
GRAPHIC DUMP ROUTINES INCLUDED •
OPTIONAL 16/32K PRINTER BUFFER • PRINTS
4 TYPE FACES • EXTERNAL DIP SWITCH •
SELECTION • TESTED BY MANUFACTURERS OF
MOST POPULAR "CENTRONICS" TYPE PRINTERS
AND TYPEWRITERS.

DEALER INQUIRIES INVITED

Telesys
415-651-2970


43334 BRYANT ST., FREMONT CA 94539 TELEX 4992029

correct responses by the score. The lower the number, the better the time.

You are next asked if you'd like to play again. If so, you may choose a higher skill level and more letters.

Variables Used

- HS - High score
- BT - Best time
- V - Volume
- S - Sound (tones)
- N - Noise
- DL - Difficulty level
- NL - Number of letters
- SC - Score
- LR - Number of letters counter
- TM - Time (total)
- A - Screen color code offset (30720 for the VIC)
- B - Screen character code location (7682 for the VIC)
- LE - Letter (POKE code)
- LC - Letter (ASCII code)
- CN - Sound counter
- ER - Efficiency rating
- AT - Average time

See program listings on page 192. 

COMPUTER & SOFTWARE PROTECTION

Dealer & Distributor
Inquiries Invited



K-COVER

An anti-static, unbreakable, Computer keyboard protector.

FP884H with hinges - \$9.95 ea.
FP883 without hinges - \$7.95 ea.



strongbox

HOLDS UP TO 8
DISKETTES
& MANUALS



SP-1200 DISKETTE \$2.95 ea.
SP-1202 CASSETTE

Both available with EMI shield - \$4.49 ea.
COLORS - Black, Grey, Blue, Green,
Yellow, Almond, Melon

MONITOR STANDS

TILT 25° & SWIVEL 360°
MODEL 1400 Universal - \$29.95
MODEL 1900, Universal w/Surge
Protector/Filter, 4 Power Outlets,



Illuminated Control Switch & Circuit Breaker - \$89.95



Penguin Products
P.O. Box 7008
Roseville, MI 48305-7008

INCLUDE \$1.50 SHIPPING
CHECK, MONEY ORDER,
VISA & MASTERCARD ACCEPTED.
Call toll-free 1-800-732-0614
In Mich. (313) 774-2228

Educational Software
That Works:

Spell.

Spell It!

Spell expertly 1000 of the most misspelled words. Learn the spelling rules. Improve with 4 exciting activities, including a captivating arcade game! Add your own spelling words.

ages 10 — adult / 2 disks: \$49.95



Math.

Math Blaster!

Master addition, subtraction, multiplication, division, fractions, decimals and percentages — by solving over 600 problems. Learn your math facts with 4 motivating activities, including a fast-action arcade game! Add your own problems.

ages 6 — 12 / 2 disks: \$49.95

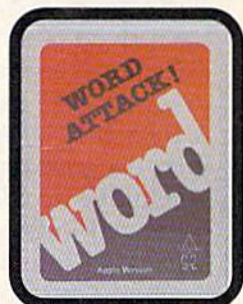


Word.

Word Attack!

Add 675 new words to your vocabulary — with precise definitions and sentences demonstrating usage. Build your skills with 4 fun-filled activities, including an arcade game! Add your own words.

ages 8 — adult / 2 disks: \$49.95



Read.

Speed Reader II

Increase your reading speed and improve comprehension! Six exercises designed by reading specialists vastly improve your reading skills. Chart your own progress with 35 reading selections and comprehension quizzes. Add your own reading materials.

high school, college & adult / 2 disks: \$69.95



The Davidson Best Seller Tradition.

For your Apple, IBM or Commodore 64.
Ask your dealer today.

For more information call: (800) 556-6141
In California call: (213) 373-9473

Davidson & Associates
6069 Groveoak Place #12
Rancho Palos Verdes, CA 90274

 Davidson.



REVIEWS

MicroFiler: A Data Base For The 64

Charles Brannon, Program Editor

If you've been looking for a fast, flexible, and easy-to-use data base program, *MicroFiler* may be well worth your attention.

The term *data base* has come to have two meanings. It can refer to a large base of data, or the program that manages the data. A data base program can be a fully programmable data language like *dBASE II*, or a computerized index card file.

MicroFiler falls into the latter category, but does far more than a glorified file card box.

Unlike disk-based data bases, which dynamically retrieve all records from disk, *MicroFiler* is memory-oriented. The performance of disk-based data bases depends on the speed of the disk drive, whereas a memory-oriented data base is much faster, but limited by available memory to a certain number of records. However, this permits 64 owners who use Datassettes to take full advantage of *MicroFiler*. You initially load all your records from tape or disk, do your entering, editing, searching, and printing, then save the data back out to tape or disk.

Since *MicroFiler* is on cartridge, there's no frustrating delay while the program loads.

The cartridge becomes part of the 64's memory, turning your machine into a filing system.

Creative Data Entry

When you turn on your computer, the *MicroFiler* title screen comes up, where you select Create File. A blank screen with a menu bar at the top appears. Here's the fun part. Using full screen editing, you "draw" a form you'll use to enter your data. Reverse-field spaces mark the blanks which will be filled in when you enter data. The number of spaces you type out determines how much memory is reserved for that field in the record. You can type names for the blanks, even embellish the form with graphics characters and color.

This is one of the most flexible ways I've ever seen to create a data entry form. When entering data, you're not required to place these entries into all fields. If you want to enforce entry, place a reverse-field C in the first spot in the field. Numeric fields, which can be summed and averaged, are specified with a reverse-field N. *MicroFiler* won't let you enter an illegal number in a numeric field.

Entering your data is just as easy. The cursor up/down keys move directly from field to field. You can only type into the reverse-fields you earlier prepared. Full cursor editing is supported within each field. After you've entered a record, press f1 to store it. Since there are only 1000 characters in a 40 × 25 screen, this is the limit of how big a record can be. With labels and prompts, you have even less room. However, if you use short records, you can, of course, have many more in memory.

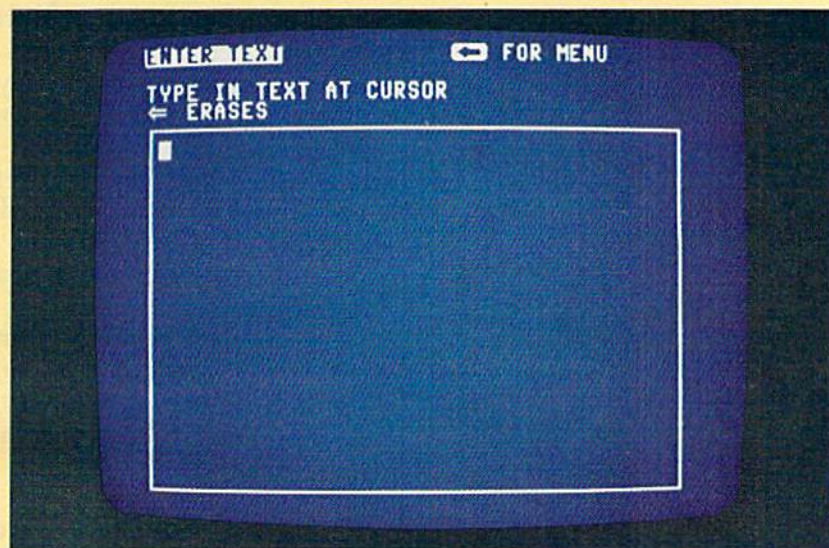
After you've entered some data, you can scan through the records. If you're using *MicroFiler* as a recipe filer, you may want to find the lasagna recipe. Instead of scanning through all the records, you can search for the name of a recipe. Or perhaps you're keeping a mailing list, and would like a display of all clients located in your home state. You just enter certain search characters within the field(s) you want to search or combine searching and sorting as you view your records. You can also generate a sum or average of all numeric fields.

Designing A Printout

If it's hard copy you want, *MicroFiler* lets you enter certain

THE BANK STREET APPROACH TO WORD PROCESSING:

"SIMPLIFY! SIMPLIFY! SIMPLIFY!"



Using the Bank Street Writer is almost as simple as sitting down with a blank sheet of paper—just load the program and start writing.

In the weeks following its introduction, the Bank Street Writer became a leading best seller, and for some very simple reasons.

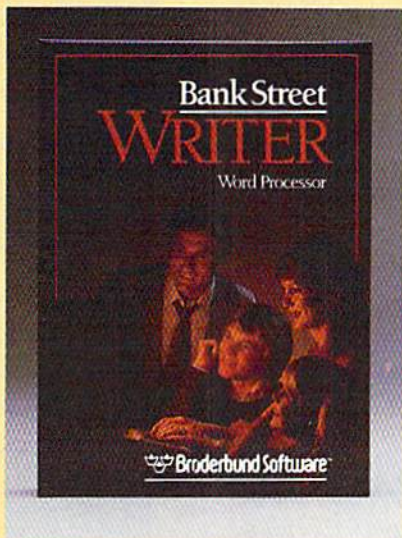
Here, finally, is a word processor that lives up to its promise to be easy to use. Most people (children included) can begin using it in a matter of minutes. Yet it puts you in full control of the powerful features most wanted in a sophisticated word processing program. All at a price that makes it as easy to buy as it is to use.

SIMPLY MORE SIMPLE.

The Bank Street Writer was developed in association with the Bank Street College of Education in New York. Designed to be its own tutor, the Writer will guide you along with on-screen prompts and easy-to-follow menus so you can concentrate on *what* you're doing instead of *how*. On-screen prompts and selections are in plain English, so there's no memorizing complex computer codes, keys or symbols. You'll be writing, correcting and rearranging your words with just a few keystrokes.

SIMPLY MORE POWERFUL.

For all its simplicity, the Bank Street Writer offers some very impressive features. You can center titles or indent with ease, and automatic word wrap lets you forget about pressing "return" at the end



of each line. Never worry about changing your mind—you can add, move, insert or delete single words, lines or even entire blocks of text and then restore the deleted copy if you want it back. Using the search and replace option, the Bank Street Writer will scan your document for a particular word, replace it with another, and then verify the replacement. And when you're ready to print, you can format your text in any way you'd like. Answer a few simple questions and you can set margins and line spacing. The Writer will number pages either at the top or bottom or not at all—whichever you prefer. You can easily save your text on a disk, then retrieve it later to re-read, print or do more editing.

And to make your writing letter perfect, soon there will be a spelling checker available for use with the Bank Street Writer. Bank Street Speller finds errors instantly and corrects them by looking up entries in its electronic dictionary.

SIMPLY MORE AFFORDABLE.

Best of all, Bank Street Writer's suggested retail price of *\$49.95 for the Commodore 64* makes it simply the best word processing value around. And it comes with everything you need, including complete documentation and a free back-up disk, to begin simplifying your life today.

THE BANK STREET WRITER is also available for the Apple, IBM and Atari home computers. Apple is a trademark of Apple Computer, Inc. Commodore 64 is a trademark of Commodore Electronics, Ltd. Atari is a trademark of Atari Corp. IBM is a trademark of International Business Machines, Inc. For more information about Broderbund and our products, write to us at: 17 Paul Drive, San Rafael, California 94903. ©1984 Broderbund Software.

**SIMPLICITY. POWER. VALUE.
IT MAKES GOOD SENSE.
THE BANK STREET WRITER
FROM BRÖDERBUND.**


Broderbund™

characters into the fields, describing the printout in terms of fields included, the order of

fields, how many spaces between fields, and the location and number of carriage returns.

Turn your own Commodore 64 into a graphic workstation:

\$149



FLEXIDRAW™ is the exciting and affordable Light Pen/Software System for people who need drawings, schematics, plans, layouts or graphics in their work.

A REAL WORKING TOOL THAT'S FUN TO USE. Be more productive right away. Draw and fine-tune design ideas right on your CRT . . . with your Light Pen. Then generate drawings or hard copies in black and white or color quickly and effortlessly.

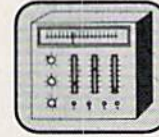
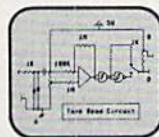
And because you're unconcerned with computer commands you can focus on what you're working on. Fact is, work becomes a lot more fun.

FEATURE-RICH GRAPHICS AT YOUR LIGHT PEN TIP. Select from a wealth of drawing modes listed on the screen. Move fluidly from freehand drawing to lines, boxes, arcs, circles, ellipses, zooms, cross hairs, grids. Plus, flips, rotations and split screens . . . virtually all the functions you'll ever need.

FLEXIDRAW gives you the freedom to manipulate and handle images as you work. Create your own templates and patterns to go with the standard Flexidraw templates and 512 pattern fills. There's seven different type styles for text. And 16 hi-res colors may be added. There's also a Sprite Editor and Animator. An exclusive Transgraph feature even lets you send graphics to distant locations via modem.

EXCLUSIVELY ENDORSED BY THE U.S. COMMODORE USERS GROUP. Test draw FLEXIDRAW yourself at your nearest Commodore Software dealer now.

P.O. Box 85152 MB 290, 7677 Ronson Road, San Diego, CA 92138, (619) 268-8792



You can arrange your printout in a number of ways. You can design a columnar report, or a mailing label. When you print, you can enter the search and sort keys to let you print only a selected part of your data base, with or without sorting or alphabetizing. You can also create a sequential file on disk, ready to be loaded or merged with a word processor capable of reading the file.

MicroFiler does have some limitations. Since the number of records is limited by memory, you may need to keep several separate data bases with the same entry form. You cannot add an extra field or change any part of the entry form without losing all your data. (Many data bases have this limitation.) There is no way to print column heading or field names with the data, or to print headers, footers, or page numbers. Other than summing and averaging, no math operations are supported on numeric fields.

Nonetheless, MicroFiler has rare power for such an easy-to-use program. The ease with which you define and enter records and the flexibility of sorts, searches, and printouts all make MicroFiler stand out against the glut of inferior data bases. You might not want to use MicroFiler for complex business record keeping, but it will do an outstanding job for casual or home applications.

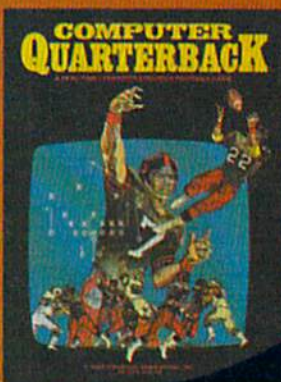
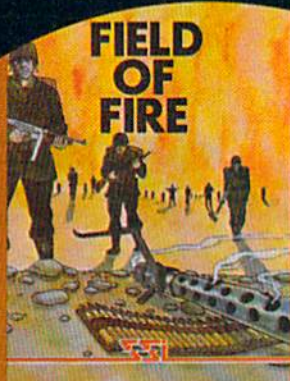
MicroFiler
Microbits Peripheral Products
225 W. Third Street
Albany, OR 97321
\$49.95



©INKWELL SYSTEMS, 1984

Flexidraw™
INKWELL SYSTEMS
"A Pen for Your Thoughts"

LOOKING FOR STRATEGY GAMES FOR YOUR COMMODORE 64™?



YOU'VE JUST FOUND SIX OF THE BEST.

FIELD OF FIRE™. One of the finest fighting forces during World War II was Easy Company of the First Infantry Division. Now, FIELD OF FIRE takes you back in time to assume command of these heroic men, retracing eight of their historical battles in North Africa, Sicily, France and Germany. For novices and battle-hardened veterans alike. \$39.95.

RAILS WEST!™ is a sophisticated business/educational game that takes you back to 1870. As an entrepreneur among the likes of Jay Gould and Collis P. Huntington, you'll wheel and deal as you try to build the richest Transcontinental railroad by making decisions about financial strategies. For up to eight players, it is fun, challenging, and exhaustive in detail and realism. \$39.95.

All games are on 64K disk.
COMMODORE 64 is a trademark of Commodore Electronics, Ltd.

BREAKTHROUGH IN THE ARDENNES™ represents SSI's dedicated efforts to provide a close look at one of the most popular wargame topics: The Battle of the Bulge. Designed for the avid strategist, this regimental/brigade-level simulation possesses comprehensive combat rules and features. \$59.95.

PRESIDENT ELECT™ is perfect for all arm-chair politicians, especially in this election year. You can campaign for the Presidency in a grueling 9-week race using historical or imaginary candidates. And every major electoral parameter has been duplicated to make this educational game the most realistic model of the campaign process ever made! \$39.95.

BROADSIDES™. This strategy/arcade game brings back all the romance and excitement of the adventurous age of fighting sail by letting you command your very own 18th-century warship. You'll make all the military decisions a real captain must make, resulting in non-stop naval action, as fast and demanding as the historical battles it re-creates. You can even construct a ship of your own design. \$39.95

COMPUTER QUARTERBACK™. Kick off with the pros in this popular real-time strategy simulation of NFL and semi-pro football. Choosing from a wide variety of offensive and defensive options, you can play with actual historical teams or ones that you've drafted yourself. \$39.95.

Look for these games at your local computer/software or game store today!



STRATEGIC SIMULATIONS INC

If there are no convenient stores near you, VISA & M/C holders can order direct by calling 800-227-1617, ext. 335 toll free. (800-772-3545, ext. 335 in California.) To order by mail, send your check to: Strategic Simulations Inc, 883

Stierlin Road, Bldg. A-200, Mountain View, CA 94043. Please include \$2.00 for shipping & handling. (California residents, add 6.5% sales tax.) All SSI games carry a 14-day "satisfaction or your money back" guarantee.

FOR ALL SSI GAMES, WRITE FOR YOUR FREE COPY OF OUR COLOR CATALOG.

NATO Commander Art Hunkins

NATO Commander, from MicroProse Software, is an accessible, single-player war-game simulation that quickly gets you deeply involved. And it's fun to play. The basic commands are easy to learn (one-and-a-half to two hours should do it), and its main challenge is strategy. An "accelerated real-time combat simulation" (action is updated in 5-minute chunks), it pits NATO vs. Warsaw Pact forces, with you as NATO chief.

Scenarios are based on actual and anticipated European theater strategy, including what is known of Warsaw Pact strengths and weaknesses, NATO reinforcement readiness, and France's intentions (should war break out).

A Pause To Reflect

The game's chief attraction is its ability to let you *freeze* action—a kind of "time out" to survey the situation, plan strategy, and make any moves you desire. Since *freeze* can be activated at any time, action can best be described as unstructured and free-flowing; you as commander can interrupt, interact, and change strategy whenever you want. This tactical immediacy is both captivating and realistic. So is the political dimension: Scoring includes both combat and political elements (use of nuclear weapons scores negative political points).

Strategy is of necessity defensive (although one of five scenarios involves a pre-emptive

first strike); tactical nuclear weapons are strictly a last resort, for use only when conventional remedies have failed or when the enemy has first gone nuclear—and then only after authorization from the commander-in-chief. To win, you must both keep up your guard (defend your cities), and employ your forces appropriately (each force type specializes in a particular role).

The game offers numerous options and many types of armed forces (there are multiple kinds and functions of units). In addition to the five scenarios, the game comes up in "demo mode," a feature purporting to make it more accessible to first-time players. Other noteworthy features include daily status reports, interspersed with announcements of political events which affect game action (based on historical probability).

Each military unit is "intelligent"; it does its own reconnaissance, choosing its own most favorable course of movement (this particularly applies to Warsaw Pact forces). Radio and teletype messages link you with your various units, and your access to the field is immediate.

The graphics are good, though basic. A joystick moves you around the display map, which shows water, rivers, terrain features and towns, as well as the various forces. A particularly nice, though occasionally disturbing, feature is the shift from day to night—from light to



dark background. Action is slow and difficult following the dramatic shift to black. On the whole, color is particularly effective in helping identify both forces and terrain features.

A Few Drawbacks

The documentation is sketchy to average. The vital information is all there, but not all the screen action and graphics are explained. Nor (in sufficient depth) are the roles of morale and terrain.

The map graphic is surprisingly difficult to follow and figure out, even when used with the map included in the documentation. Then there are the all-too-frequent misspellings and syntax errors, coupled with poorly formatted text that splits words between lines. The documentation still shows traces of conversion from the Atari original.

Nevertheless, as a one-player simulation, *NATO Commander* is both exciting and realistic. It is relevant to today's political climate, since it plays according to

Christmas Carols for the 64



Sing Along With Your Favorite Songs

Here's a great way for you and your family to have fun with your Commodore 64™ this Christmas. Our exciting new Christmas Carols disk features 18 of your favorite holiday songs; each professionally arranged for the 64 with entertaining graphics. For sing along fun, the lyrics appear in easy-to-read verse on your TV or monitor. Play just your favorite song or set your Commodore to play them all. It's a great way to show off your computer. As always, you can trust John Henry Software to bring you quality software at the lowest price. We specialize in prompt delivery and guarantee our product. Don't wait, order your Christmas Carols today!



An Actual Screen

SONGS INCLUDE:

Angels We Have Heard on High • Away in a Manger • O Come All Ye Faithful • Deck the Halls • The First Noel • God Rest Ye Merry Gentlemen • Hark the Herald Angels Sing • O Holy Night • It Came Upon a Midnight Clear • Jingle Bells • Joy to the World • Jolly Old St. Nicholas • O Christmas Tree • Silent Night • O Little Town of Bethlehem • We Three Kings of Orient Are • What Child is This • Up on the Housetop

ALL FOR ONLY
\$15.⁹⁵

Send check or money order for \$15.95, U.S. funds, plus \$1.00 for postage and handling. Or use your Visa or MasterCard (include your account number and expiration date). Foreign orders, add \$3.00 for Air Mail delivery.

For more information write us at:
P.O. Box 39021, Cincinnati, Ohio 45239
U.S. orders received by December 15, are
guaranteed for Christmas delivery.

Commodore 64 is a registered trademark of Commodore Electronics Limited.

Please send me _____ Christmas Carols disk(s) at \$15.95 each plus \$1.00 postage and handling. Ohio residents add 88¢ sales tax.
 Check or money order enclosed Visa MasterCard

Account# _____ Exp. Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Send to John Henry Software, P.O. Box 39021, Cincinnati, Ohio 45239.
Foreign orders please pay in U.S. funds and add \$3.00 for Air Mail delivery.




John Henry Software®

QUALITY IS OUR STRENGTH

the "rules" of the European theater of the '80s. Although it offers multiple levels of difficulty, it can be approached by first-time war gamers, and gives some notion both of contemporary command strategy and the challenges, intricacy, and immediacy of modern warfare in the West. *NATO Commander* has interactive excitement, the realism

of today, and considerable staying power. Recommended for those who want a different kind of contemporary war game, and for the adventurous novice war gamer.

NATO Commander
MicroProse Software
10616 Beaver Dam Road
Hunt Valley, MD 21030
\$34.95 (Commodore 64 disk) 

change color to indicate who last occupied them.

All in all, the graphics are very attractive. Because everything happens on only one screen, though, the units are a bit small to be comfortably focused on for more than a couple of hours at a time. The game is playable on a black-and-white TV or monochrome monitor, with little trouble distinguishing shades.

Road To Moscow

Neil Randall

On June 22, 1941, Hitler invaded the Soviet Union. The next four years saw the largest land campaign ever fought, as the Germans pushed the Soviets to the brink of surrender and then began the long, slow retreat to Berlin. To the Allies, it was known as the War in the East; to the Soviets, the Great Patriotic War. To the Germans, it was simply the Russian Front.

Road to Moscow for the 64 is a re-creation of the entire Russo-German war. The screen displays a map of the Soviet Union from Poland to the Ural Mountains (west to east) and from Finland to the Black Sea (north to south). You're given command of the German forces, which you must maneuver using either the keyboard or a joystick. To win the game, you must capture as many Russian cities as possible, then hold on to them. The Soviets (your 64) will do everything possible to stop you. Each turn represents two weeks of real time.

Graphic Realism

On the map of the Soviet Union, you see five types of terrain: forest, swamp, mountains, seas, and clear. Each has a distinct graphics symbol, and each is appropriately colored. The map changes color with the seasons: light gray during clear weather (summer and fall), yellow during spring, and a very stark white throughout the long Russian winter. This last change has an interesting psychological effect, as you soon come to dread winter as much as the Soviet army.

The armies themselves consist of small square "units." You can choose standard designations (for example, infantry is a square containing an X), or icons, which show a picture of the type of unit (infantry is a little man, armour is a tank). German units are black, changing to light blue when less than half-strength. Russian units are red, changing to pink when depleted. The cities on the map

A Choice Of Scenarios

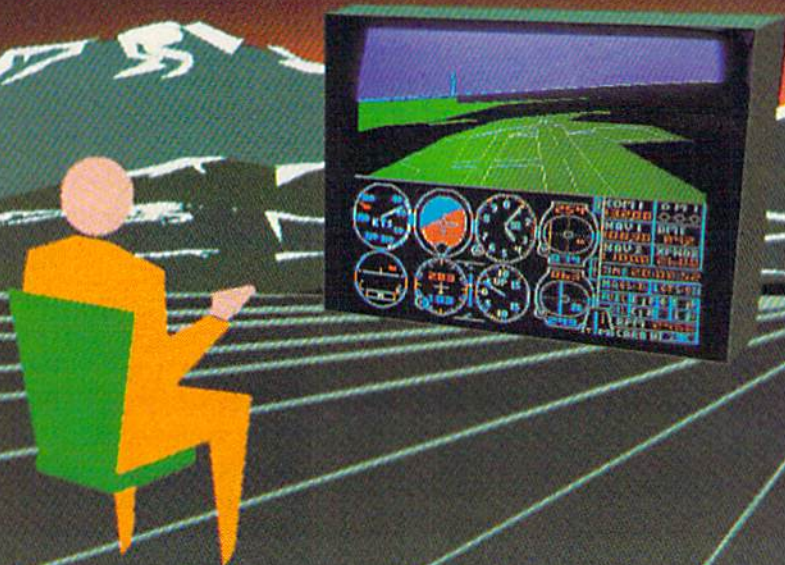
Road to Moscow has five scenarios. Four of them cover individual years of the war, and one the entire campaign. The 1941-42 scenario takes the war from the German jump-off point to the battles near Stalingrad. At the other extreme, the 1944-45 scenario shows the last, desperate German defense of Poland. The campaign game covers the war from start to end, and is the one you'll want to get to as soon as possible.

The small scenarios take about five hours to play, once you have a few hours experience. The campaign game is an undertaking of 20 to 30 hours. The program disk allows one game to be saved on it, however there is no provision for saving a game on a separate disk.

Game play is unusual in that both sides move simultaneously. First, using the joystick or keyboard, you plot movement for each German unit. While you're doing this, the computer is plotting movement for the Soviet units. When you

Flight Simulator II

For
the Commodore 64™



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

See your dealer . . .

or write or call for more information. For direct orders please add \$1.50 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.

Order Line: 800/637-4983

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

finish plotting, type G and the computer performs the actual movement of both sides' units. Whenever enemy units are plotted to enter the same square, they fight.

When you "pick up" a unit, a one-line display at the bottom of the map shows the unit's current strength, potential strength, and current supply status. Units which are depleted can be taken out of the line and into a city to receive reinforcements. The supply status is a number from 0 to 9, with 9 meaning full supply and 0 indicating that the unit has been out of supply for two months. A unit with low supply takes heavier casualties, cannot move at full speed, and cannot receive replacements. In other words, it's in trouble.

A unit is moved with either a joystick or the function keys. You simply pick up a unit, plot where you want to go, then drop it. You may change its move at any time. Even if you use a joystick, the function keys are available for such purposes as identifying cities and changing-movement plots. Strangely, I find keyboard control easier than joystick control.

Simulating History

Road to Moscow handles all the major aspects of the Russo-German war. The Germans are immensely superior to the Soviets in effectiveness for the first part of the war, but the Soviets keep getting better. The player watches as Soviet reinforcements and replacements keep coming and coming, always seeming to fill the gaps at the

last moment. Russian artillery appears in mid- to late-1943 and smashes anything that stands in its way. You must use your armored units to sweep around and trap the Soviets; if you try to go right through them, you'll suffer too many losses.

There is even a series of Strategic Events, happenings beyond the player's control. As an example, the game may begin six weeks early (May 1941) to reflect what might have happened had Hitler not conducted a Balkans campaign before invading Russia. Historical events include the invasions of Italy and France, both of which siphon off troops from the Russian front. These events are introduced by the computer, and they interact with each other.

What is most impressive about *Road to Moscow* is its sense of focus. Wars are complex affairs, and a game cannot simulate every aspect of even a small war. The players must be cast in a historical role, be it tank commander, brigade commander, or commander of the entire war.

Road to Moscow places the player in the role of German strategic commander (historically assumed by Hitler). He is free to do with his troops as he will, but he is under the historical constraints of time, weather, and manpower. Unlike many war games, though, *Road to Moscow* makes the player's role very clear. He is not concerned with small-unit tactics, not even with small battles. He must deal with overall troop movement,

and that's it. The game reminds me of military maps, with troop movements shown by arrows. The arrows show where the commander hopes the units will end up, which is what this game's plotting system does for the player.

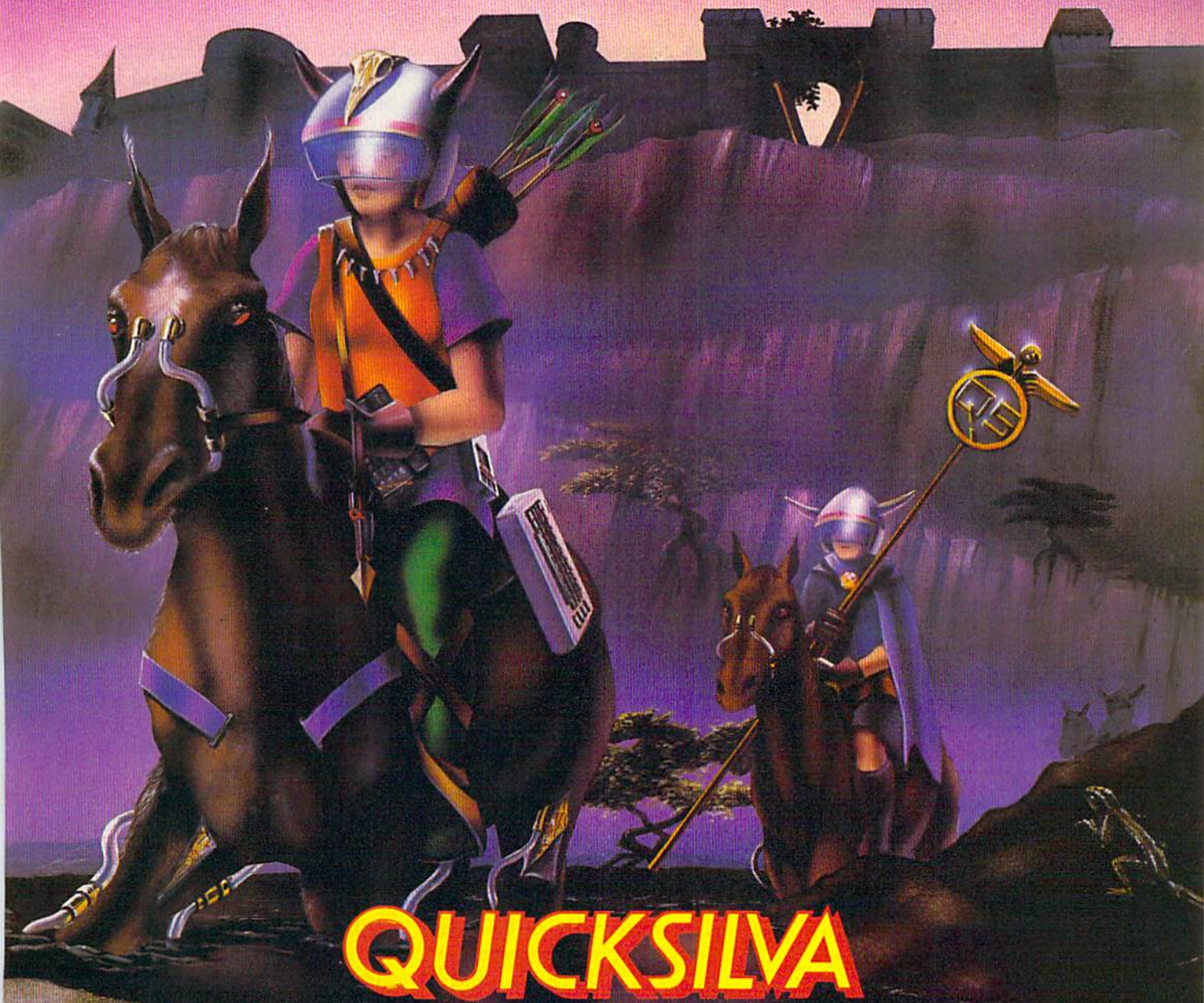
Nothing's Perfect

Despite its overall success, however, there are a couple negative points. Allowing only one game to be saved is inconvenient, and writing it to the game disk seems a little dangerous, should anything go wrong. If you forget to turn on the drive before saving the game, you lose it and must start over from your last save. Surely a warning message could show up instead. It would have been nice to allow units to move diagonally, since doing so would permit a more gradual (and safer) retreat. (Since units are joystick-controlled, I think this would have been both logical and effective.)

Finally, I would like to have seen a more explicit way of showing when units are destroyed. As it stands now, the computer flashes the unit's name on the status line, but it is almost impossible to tell which unit has just been eliminated. A better handling of this would help the player learn how to fight battles more efficiently.

More importantly, the documentation is a little vague on how the game actually works. I suspect this is intentional, the idea being to learn as you play. But war gamers tend to be an analytical lot, and want to know how the computer conducts

A STEP BEYOND.



QUICKSILVA

All Titles available from:

QUICKSILVA INC. 426 West Nakoma San Antonio Texas 78216. (512) 340 3684.

ANT ATTACK



THE SNOWMAN



BOOGABOO



FRED



PURPLE TURTLES



COMING SHORTLY!
Programs for ACORN, ATARI,
MEMOTECH MTX, SINCLAIR QL
and MSX SYSTEM

Available on Disc for the COMMODORE 64™. Send for details of our full range of Commodore programs.

combat and where it gets its numbers. The game uses a system different from other computer war games, and should therefore be explained in greater detail. Since Ba'rac plans other games using this system, perhaps we'll see more explanation.

Road to Moscow is one of

the best computer war games available, for two main reasons. First, it uses a system which plays quickly and yet allows the player to feel like a theater commander. Second, it simulates one of the most interesting wars of all time. For these reasons, and because it does its job dif-

ferently than other computer war games, I recommend it to both beginner and veteran.

Road to Moscow
Ba'rac Limited
P.O. Box 37206
Shreveport, LA 71133-7206
\$29.95 (disk)

The Castles Of Dr. Creep

Thirteen castles, over 200 rooms, countless passageways, and legions of creatures make this arcade game for the Commodore 64 one that plays for days, not just hours.

After selecting the castle you want to explore (there's a tutorial game that quickly shows you how to play and illustrates the different elements of a castle), your character appears in a room. Sometimes you have but one possible exit, because the other doors are locked or simply cannot be opened from this side. Other times you have a choice. Running through a doorway and up the passageway (graphically entertaining in itself), you find yourself in another room.

But there are electrostatic generators (remember the huge silvered balls, with lightning sparking off them, from the old horror movies?), matter transmitters, force fields, trap doors, moving sidewalks, automated death rays, ladders, fireman's poles, and walkways filling each room. To make things even more complicated, Frankenstein monsters and stumbling mum-

mies leave their coffins and tombs and follow you almost everywhere. The combination and number of these devices and creatures sets the difficulty of the room.

Each room is a puzzle in itself. How can you get to the generator switch when a Frankenstein bars the way? How can you close that trapdoor without electrocuting yourself?

And the rooms comprise a greater puzzle—the castle itself. You somehow must escape. To do that, you have to find and pocket the numerous keys scattered throughout the building. Only then can you find your way back into the light.

The Castles of Dr. Creep is an entertaining, engrossing game that manages to combine arcade action, superior graphics and sound, and strategic puzzle solving. You need quick thinking, and even quicker reflexes to find your way out. And with

Also Worth Noting

two players, one at each joystick, it becomes a medley of competition and cooperation. Transylvania was never so hard to leave.

Brøderbund Software
17 Paul Drive
San Rafael, CA 94903
\$29.95 (disk)

Dragon's Keep And Troll's Tale

These two new children's adventure games for the 64 from Sierra are teachers as well as entertainers. Both are graphics/text adventures in which the player travels from scene to scene, following clues, to locate missing objects. In *Dragon's Keep*, the object is to rescue animals, in *Troll's Tale* to find hidden treasures. Each game has good graphics, and the constant disk access, common to most adventure games, doesn't cause too long a wait. Each package includes maps and stickers to help the child visualize and track his or her movements.

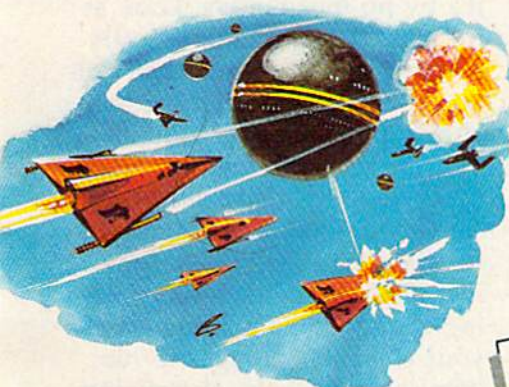
The skill focus of these adventures is on identifying details, understanding inferences, and drawing conclusions. *Dragon's Keep* is designed for ages

Get more out of your Commodore with

COMPUTE!'s GAZETTE

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

More fun



Martian Prisoner, The Viper, Skydiver, Snake Escape, Demon Star, Cyclon Zap and Oil Tycoon are just a few of the ready-to-run games you'll find exclusively in *COMPUTE!'s Gazette* each month. Just type in the programs and watch your screen explode with colorful new computer game excitement.

More challenge

Ready to tackle more advanced projects? In *COMPUTE!'s Gazette* you'll learn How to Use Tape and Disk Files. How to Program the Function Keys. Writing Transportable Basic. How to Make Custom Graphics Characters. New Ways to Enliven Programs with Sound. One Touch Commands for the 64. How to use Machine Language. Speeding up the VIC 20—and much more!

Children will learn and develop new skills with States & Capitals Tutor, Wordmatch, Munchmath, Wordspell, Connect the Dots, Aardvark Attack and Alfabug. *Computing for Kids*, a regular monthly feature, will uncover new ways to involve your children in computing.

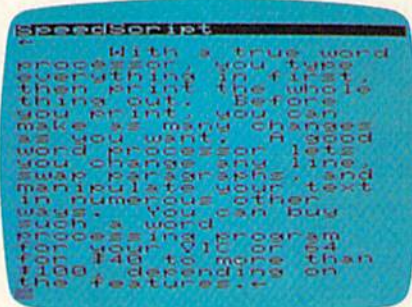
More programs

Programs to help you balance your checkbook, store your addresses, keep tax records, manage your personal business. You can create your own programs and games, improve your word-processing, spreadsheets and data base management, load and run faster with 64 Searcher, VIC/64 Program Lifesaver, Quickfind, Word Hunt, Disk Menu, VIC Timepiece, Automatic Proofreader and more.



More buying guidance

You'll profit from comprehensive reviews of everything from data-quality cassette tapes to software to graphics plotters and modems. Virtually anything that's compatible with your Commodore is reported on in *COMPUTE!'s Gazette*. With this kind of expert help, every computer purchase you make can be the right one!



More savings

You can save up to 40% off the newsstand price of *COMPUTE!'s Gazette* by subscribing now. All you do is mail the coupon below or the postpaid card bound into this issue. But don't delay! Subscribe now to start receiving every issue of *COMPUTE!'s Gazette*.

SAVE UP TO 40% ON **COMPUTE!'s GAZETTE**

Yes! Start my subscription to *COMPUTE!'s Gazette* at big savings off the newsstand price:

1 year \$24—Save \$11.40 off

2 years \$45—Save \$25.80 off

3 years \$65—Save \$41.20 off

1 year \$30—Canada, Mexico,

Foreign Surface Mail

Name _____

Address _____

City _____

State _____ Zip _____

Payment enclosed Bill me

Charge my

Visa MasterCard Am. Ex.

Account No. _____ Exp. Date _____

COMPUTE!'s GAZETTE CALL TOLL FREE 800-334-0868

P.O. Box 961, Farmingdale, N.Y. 11737

seven and up and teaches compass directions. *Troll's Tale* is a bit more complex and is designed for ages eight and up.

Both games are well designed and fun to play. Just as importantly, they don't get in the way of the interactive process. No matter what choices a youngster enters, the programs provide guidance to those who may get frustrated, and they teach important skills.

Sierra, Inc.
P.O. Box 485
Coarsegold, CA 93614
\$29.95 disks

Rug Rider

You'll need to develop a deft touch with the joystick to take full advantage of this new action game from International Tri Micro. Very much in the tradition of *Joust*, *Rug Rider* puts you in command of a free-floating magic carpet piloted by a red-robed, turbaned character, Ahmed. You fly among clouds, caves, forests, mountains, and castles collecting power and experience for the final confrontation with the Evil Genie.

Rug Rider lets you scroll and choose any of 32 screens, each with different terrain and challenges. Colorful graphics, sprightly music, and a variety of obstacles help keep the game lively. As with almost any good action game, mastering the joystick movements takes a bit of practice. It is particularly important that you not let Ahmed come in contact with objects on the screen, such as the bottom of a cloud or any of the lethal instruments of destruction.

In each round, you gather

all of the keys on the screen, freeing the treasure for you to take. By using the space bar, your character can fire bolts of magic at the Evil Genie and lesser threats. This is an awkward component of the game, however, and in practice is difficult to use effectively.

Rug Rider includes a good mix of activities on the different screens. Sometimes you'll need to drill for the magic keys. On other occasions, you'll have to pick up and drop heavy irons, or brandish magic shields. Destroying the Evil Genie is the toughest part of a very challenging game. You'll have to hit him with your magic bolts more than once to achieve the desired results.

International Tri Micro
1010 N. Batavia Unit G
Orange, CA 92667
(714) 771-4038
\$29.95 (disk)

Impossible Mission

From the moment you hear the sinister voice of Dr. Elvin Atombender welcome you to his underground stronghold, you know this new action-puzzle game from Epyx is something refreshingly different. Fast action, superb graphics and sound effects (including speech synthesis), a somersaulting central character, and a difficult code for you to crack make *Impossible Mission* a game you can come back to and still enjoy.

As a special agent attempting to stop Atombender from destroying the world, you run through the tunnels and ride the elevators of his headquarters seeking pieces of code, which

are the keys to preventing annihilation. More than 30 rooms must be searched, and 90 robots have to be circumvented while you gather parts of the puzzle. As you pick up the code, the pieces are automatically transferred to your Agency's computer, which will help you unscramble the meaning. But it's by no means easy. Look at the pieces, flip them vertically or horizontally, match their colors. Call the computer for help. Hurry, time is running out.

There are numerous subtle touches which make *Impossible Mission* unique. The sound effects are extremely well done, including Atombender's taunting comments, a chilling cry if your character plunges to his demise, the robots' electrifying zaps, even the footfalls as you run through the tunnels and the rooms. Two code rooms permit you to pick up "snooze" passwords (which temporarily stop the robots) and "lift inits" (which reset the elevators in a room) if you can correctly remember a sequence of musical tones.

If time runs out before you've solved the code, Atombender's mocking laughter will haunt you as the screen breaks up in destruction. Each time you play the game, it generates a different pattern of rooms and a variety of codes for you to break. This game presents an excellent combination of features which takes full advantage of the Commodore 64's capabilities.

Epyx, Inc.
1043 Kiel Court
Sunnyvale, CA 94089
Approximately \$35 (disk)

Unlimited Free Programs - Unlimited Fun! with **VIP Terminal**[™]

A Powerful 80 Column Communication Program!

VIP Terminal is what you need to talk to the world! Communicate with friends, work, school, bulletin boards, even information services like CompuServe. Share programs, news, pictures, stock quotes - anything in writing. With your C64, any modem and VIP Terminal, you can master the information revolution — professionally!

VIP Terminal is power packed to get the job done! It features a professional 80 column display (40, 64 & 106 columns too!) to bring your C64 up to the industry standard - without any hardware modification! It works with all popular modems, and, with those that allow it, VIP Terminal will auto dial, and redial if the line is busy. It also will auto answer - even take messages! Of course you can send and receive programs and the like. And you can print what is coming on the screen. It has a 16-entry phone book for those often used numbers, and a 20-entry message file for frequently sent messages. It also has a powerful editor so that you can write messages to send later, or edit ones you have received. You can even save and use files as large as your disk!



VIP Terminal Is Easy and Fun to Use!

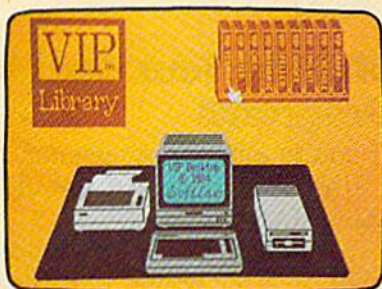
VIP Terminal makes full use of the potential of your C64 - you get color, graphics and sound. VIP Terminal uses menus and "icons," pictures of the tasks to be done. In fact, VIP Terminal can almost be totally controlled with a joystick. You can switch menus, change screen colors, change parameters, even dial your phone without ever touching your keyboard! Just move the hand to point to the colored icon, or the entry, press the fire button, and the change is made. Of course, it all can be done from the keyboard too!



Help is built right into the program so you can't get lost or confused. The manual is even capsulized on the disk for reference from the program when you need it. VIP Terminal also has a chiming clock for the quarter hour and the hour, and an alarm you can set. There's even a musical alarm to let you know when you have a call. VIP Terminal has put it all together to make the perfect communication program!

Integration With VIP Desktop

VIP Terminal is connected to the whole VIP Library[™] of programs through VIP Desktop[™]. From VIP Desktop, you may access any of the other VIP Library programs that you own. The rest of VIP Library will meet your word processing, financial planning, data management and other essential home and business information management needs. All VIP Library programs feature high resolution graphics to give 80 columns on the screen without any hardware modification. They also give you icons and plenty of help. Quality and affordability are our number one concern!



VIP Terminal ONLY \$59.95

Available at Dealers everywhere. If your Dealer is out of stock ORDER DIRECT!

1 - 8 0 0 - 3 2 8 - 2 7 3 7

Order Status and Software Questions
call (805) 968-4364

MAIL ORDERS: Shipping: \$3.00 U.S.; \$5.00 CANADA;
\$15.00 OVERSEAS; Personal checks allow 3 weeks.

SoftLaw

132 Aero Camino
Goleta, California 93117



Programming Commodore's Magic Voice

Betsy And Danny Byrne

Commodore's new Magic Voice Speech Module gives your 64 the power to talk. Here's a short program that acts as a "speech processor." You type the words and your computer speaks them.

Making your 64 talk to you is a simple matter now. Commodore's Magic Voice Speech Module is easy to use, and it can greatly enhance your programs with educational and entertainment value.

For starters, just plug the Magic Voice cartridge into your 64, hook a wire to your TV or monitor, and turn on the computer. Type SAY and one of the 234 available words, and your 64 is in business.

You can insert any cartridge software into the top-loading slot. Certain games, like Commodore's *Gorf* and *Wizard of Wor*, have some speech routines built in. *Gorf* guffaws (or is it a chortle?) as the game begins, "Ha Ha Ha, Space Cadet." It adds a new dimension to game playing.

Writing Your Own Voice Programs

If you're able to understand and manipulate the PRINT statement, you should have little trouble using SAY.

You can SAY a word directly, as long as you spell it correctly and put it inside quotation marks. Or you can use the word number (the number which represents a word from the available list), which saves some memory if you plan to speak a lot of words in your program. For example, SAY "MILLION" is equivalent to SAY18, because word number 18 is "million."

Besides SAY, the Magic Voice module adds two other new BASIC statements and a new reserved variable. RATE sets the speed of the words spoken. It doesn't make the pitch higher (like a cartoon character) or lower; it makes the words come out faster. VOC is a specialized

statement for use with extended vocabularies (which are not yet available as this issue goes to press). And RDY is a variable which keeps track of when the computer has finished one word and is ready to say another.

The manual includes a short program to allow the computer to speak every number from 0 to 999,999,999 when typed from the keyboard. But what if you want a program to speak the other words when they're typed in?

There are several problems that must be solved before a "speech processor" is possible.

Probably the most serious problem is the 234-word limit of the Magic Voice. It's not that it's a strange or useless vocabulary. It does contain most of the most common words. The difficult part is that, unless you've memorized the list of words, it's easy to type a word which the Magic Voice doesn't know. What happens then is the program stops and prints an ?ILLEGAL QUANTITY ERROR message.

In addition, the Magic Voice does not recognize sentences. You have to SAY words one by one. As you type sentences, the program has to watch for individual words. That's simple enough, just GET letters from the keyboard, building up the word until you reach a space (marking the end of a word). Then SAY the word and go back to get the next one.

Finally, there are some homonyms not on the list. We'd want the program to swap between homonyms if one is on the list but its counterpart isn't. For example, if you tried to SAY the words DOWN BY THE SEA, you'd hear the first three. But SEA would result in an illegal quantity error, even though the Magic Voice can say the letter C and the word SEE. Another problem is with alternate spellings, for example GREY (acceptable) versus GRAY (not).

Using Finger Talk

"Finger Talk," the program accompanying this article, addresses some of these quirks.

Our original solution to the first problem

FOR
COMMODORE
AND COMING SOON
FOR APPLE AND ATARI

“... facts attest to its EXCELLENCE!”

FAMILY COMPUTING

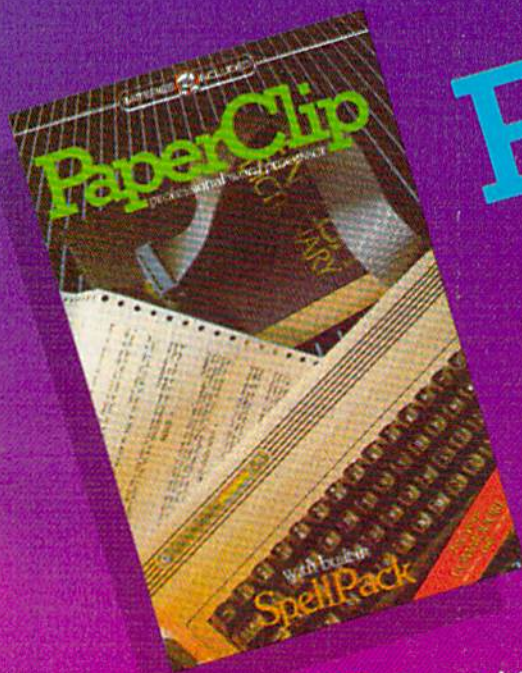
“So far as we are concerned,
Paper Clip is the top word processor
running on a micro computer.”

—Home Applications For The C-64

“Paper Clip is one of the easiest
of the professional word processors to use,
with a sensible manual and plenty of aids for the accident-prone.”

—Computing Now

PaperClip™



The Power, Flexibility and Ease of use
that Paper Clip users rave about,
combined with the infallibility
of Spell Pack.
For those who want the best in
full word processing



- 20,000 word dictionary
- User expandable dictionary
- Highlights words and documents not found in dictionary for spelling confirmation
- Re-arranges words, sentences, paragraphs, and pages with a few keystrokes
- Easy to learn, easy to use!
- 40 & 80 column output
- Compatible with virtually every printer available
- Compatible with The Consultant Database™

FROM CLAY TABLETS, THROUGH PARCHMENT, GUTENBERG AND BEYOND, MAN HAS SEARCHED FOR THE ULTIMATE METHOD TO STORE, SORT AND PRINT THE WRITTEN WORD. NOW, BATTERIES INCLUDED PROVIDES THAT METHOD, THE PAPER CLIP FAMILY. AN OUTSTANDING WORD PROCESSOR AND SPELLING CORRECTION SYSTEM FOR ALL COMMODORE COMPUTERS — AND COMING SOON FOR APPLE AND ATARI.

BATTERIES INCLUDED



“The Energized Software Company!”

WRITE FOR A FULL COLOR BROCHURE

186 Queen St. West
Toronto, Ontario,
M5V 1Z1 Canada
(416) 596-1405

17875 Sky Park North,
Suite P, Irvine, California
USA 92714

was to include lots of DATA statements to cover 230+ words and various homonyms. The numerous DATA statements contributed to the length of the original program.

Finger Talk was shortened considerably by a slight modification to the error routine. If you look at line 80, you'll see three POKES. They divert the Magic Voice module's error routine to a harmless section of memory. If you try to say an illegal word, the Magic Voice just ignores it. The program continues, instead of stopping and printing ?ILLEGAL QUANTITY ERROR.

If you own a Magic Voice and plan to write programs for it, you might want to make note of the three POKES, especially if you plan to SAY words which are INPUT by users.

The second problem, speaking words instead of sentences, is solved with the GET statement, as described above.

Several homonyms have been added. You can see them in the DATA statements toward the end of the program. They are stored in an array. When you type an illegal word which sounds like a legal one, the program trades the two and the equivalent vocabulary word is spoken.

Typing In The Program

Type in Finger Talk and save it. Before you run it, make sure you have the Magic Voice module plugged into your 64. As the program begins, the homonyms are read into memory and the title screen appears.

You are asked two questions. If you want each letter spoken as you type, answer YES to SAY EACH LETTER? For example, if this option is active, you will hear T, H, R, E, E when you press those letters. Press the space bar and you'll hear the word THREE. If you answer no, you'll hear only the word, not the individual letters.

You also choose what RATE the Magic Voice will use, from 1 for the fastest to 10 for the slowest.

After you answer the questions, the main speaking routine begins. If you type a word that's part of the Magic Voice's vocabulary, you'll hear it spoken. If the word isn't available, you don't hear anything. Press RETURN and the whole sentence is spoken.

Finger Talk limits sentences to 80 characters (two screen lines). If you reach the 80th character without pressing RETURN, the computer automatically says the sentence as if RETURN had been pressed.

The f1 key controls the RATE (1-10) from within the program. Each time you press f1, the rate is increased by 1. A single number in the upper left corner tells you the current rate (a zero means rate ten). If you make a typing mistake,

you can use the DELete key to correct it. And SHIFT-CLR/HOME clears the screen. It doesn't matter whether you use upper- or lowercase letters; they're converted to lowercase by the program.

One thing to watch for is typing a space while the SHIFT LOCK key is down. Spaces are used to mark the boundaries between words, and the SHIFted space character is different from a regular space. They look the same on the screen, but have different ASCII values. A SHIFted space is like a capital space, if you can imagine that. It's best to avoid using SHIFT LOCK when entering words to be spoken.

One other quirk comes from the way words are kept in an array until you press RETURN. If you type a few words and clear the screen (without pressing RETURN), the previous words will be spoken when you finally do press RETURN. The array is active until RETURN is pressed.

Finger Talk demonstrates what the Magic Voice module can do (and gives you something for your friends to "ooh" and "aah" over at parties). It could be useful to teach touch typing to blind people; they'll hear which key they just pressed. And kids who are learning to read could use it to practice.

See program listing on page 197. ☐

8 GAMES PLUS...

The "PREMIER COLLECTION"

A disk packed full of games and other interesting programs for the Commodore 64. For all ages and interests. ALL for \$34.95.



BULLRIDE. How long can you ride the wild bull in this fast animated computer simulation?

DARTS. Use a joystick to deflect darts toward the target. Scores like English Darts. 1-2 players.

EUCHRE. This solitaire version of the fast paced trump card game pits you against the computer.

MAXWELL'S DEMON. In this unique action game you must try to break the Second Law of Thermodynamics!

PHONE DIALER. A personal phone directory with automatic tone dialing. Stores 364 entries and 2 access codes per file.

REVERSI. 7 level machine language version of this familiar game. We bet you can't beat it on level 5!

SLIDE SHOW. Animated sequence of outer space scenes using the multi-color graphic mode.

SOPWITH CAMEL. Outfly the Red Baron and you'll win this one.

SQUABBLE. You have 3 minutes to find more words than the computer can find in the random 4x4 letter grid. The computer knows over 4,700 words. Do you?

WORDTIME. If Squabble's too tame for you, try shooting missiles at letters to form words. 2 Players.

Commodore 64 is a registered trademark of Commodore Electronics Ltd.

(Works with most 1541 format Serial Drives)

Phone or Send \$34.95 (OH. Res. add \$1.93 tax) to:

THE SOFTWARE SECTOR, INC.

P.O. BOX 273
Bellbrook, OH 45305
(513) 848-2888

Apple II/e/c • Atari
Commodore 64
IBM PCjr

Imagine...

- * A Program that gives your computer the power of full word processing, but as easy to use as a typewriter.
- * A Program that stores and retrieves any type of information and that understands real English commands.
- * A Program that enables your computer to talk over a telephone to other computers around the world.

HomePak™

by Russ Wetmore.

Featuring three of the most needed personal productivity tools;
All for the incredible price of **\$49.95***

Imagine...



Word Processing with **HomeText**
 Information management with **HomeFind**
 Telecommunications with **HomeTerm**

HomePak features all three programs on a single disk. Each program works smoothly and effortlessly with the others.

Simple enough for the first time user, but with the features and flexibility demanded by the experienced user.

DON'T JUST IMAGINE. DISCOVER HOMEPAK TODAY AT YOUR LOCAL SOFTWARE RETAILER.

BATTERIES INCLUDED 

Atari and Commodore 64 versions of HomePak are available Now. Apple II e/c and PC jr editions of HomePak will be available winter 1984.
 HomePak will also be released in versions for other major computer systems during 1985.
 Each computer system may require accessory devices such as modems, printers or cards to utilize specific features of HomePak. See your dealer for details.
 Developed by Russ Wetmore for Star Systems Software for: BATTERIES INCLUDED - The Energized Software Company
 *Manufacturers suggested U.S. list price. Dealers may sell for less. AD - 1984 Batteries Included.
 Atari, Apple, Commodore and IBM are registered trademarks of Atari Corp., Apple Inc., Commodore Business Machines and IBM Business Machines Inc., respectively.



Cosmic Combat

Tommy Graham

Wave after wave of enemy Zirconians attempt to descend on your home planet in hope of the ultimate conquest. Your only defense is your particle beam pulsar cannon, which will destroy them. But don't even let them get close—they'll self-destruct and take you along with them. An action game for the VIC and 64. Joystick required.

Alien visitors from a faraway galaxy have left their dying planet in search of a new base for their civilization. Their target: Earth. As they descend in waves, your mission is to carefully maneuver your nuclear-powered space cruiser, which is armed with a particle beam pulsar cannon.

Although you're greatly outnumbered, effective use of your powerful cannon can offset this disadvantage. A direct hit disintegrates an enemy ship. Unfortunately, the Zirconians know of your weapon and are artful dodgers. So much so, in fact, that they'll sometimes collide with each other in an effort to avoid your pulsars.

The Zirconian ships have no weapons to return your fire, but each has a self-destruct mechanism on board. When a ship reaches a certain depth, this device activates and explodes. If you're in the vicinity, your ship, too, is a victim. Fortunately, you have two extra space cruisers in reserve. If these are destroyed, it's all over.

Straightforward Operation

You must first choose one of five skill levels. Use the joystick to move your ship left and right, and

press the fire button to shoot your pulsar cannon. You receive 100 points for each Zirconian ship destroyed, but 20 points are deducted for each ship that reaches the ground.

There are innumerable waves of attack forces. When you clear one, the program displays

Programmer's Notes: 64 Version

Gary Black, Editorial Programmer

Program 3, the 64 version of "Cosmic Combat," is written entirely in machine language, so the action is very fast. As in the VIC version, you move your ship with the joystick (port 2) and blast away at the descending Zirconians. Because the game is fast at the start, there is only one skill level.

As in the VIC version, you receive 100 points for each destroyed Zirconian. However, you lose only ten points for each ship that touches down.

Typing in this version requires the use of MLX, elsewhere in this issue. Be sure to read and understand the MLX article before entering Cosmic Combat. When MLX prompts you for a starting and ending address, respond with 49152 and 51479, respectively. Load the program with LOAD "filename",8,1 (for disk) or LOAD "filename",1,1 for tape. To begin play, type SYS49152.

HAS MR. DO™ CLOWNED AROUND ONCE TOO OFTEN?

Mr. Do laughed in the face of disaster at the arcades. Now he's ready to clown around at home. It might be his last laugh if you're not careful. Just like the arcade game, monsters and their henchmen are out to do in Mr. Do. And it's up to you to try and fend them off with a powerball and goodies galore.

If you can, squash the monsters with huge apples. Or knock them dead with your trusty powerball. Slow down the henchmen with cherries. And try to escape through a maze of tunnels on 99 different screens.

Now do you have what it takes to keep Mr. Do from being done in?

For Commodore 64, Apple II series, Atari and IBM PC & PC/JR systems.

**Premier
Arcades™**



Datascop®
**WE
CHALLENGE
YOU.**

Datascop® is a registered trademark of Datascop, Inc. Premier Arcades™ is a trademark of Datascop, Inc. 1984.
Mr. Do™ is a trademark of Universal USA, Inc. © 1984. © 1984 Datascop, Inc.

Datascop, Inc., 19808 Nordhoff Place,
Chatsworth, CA 91311 • Phone (818) 701-5161

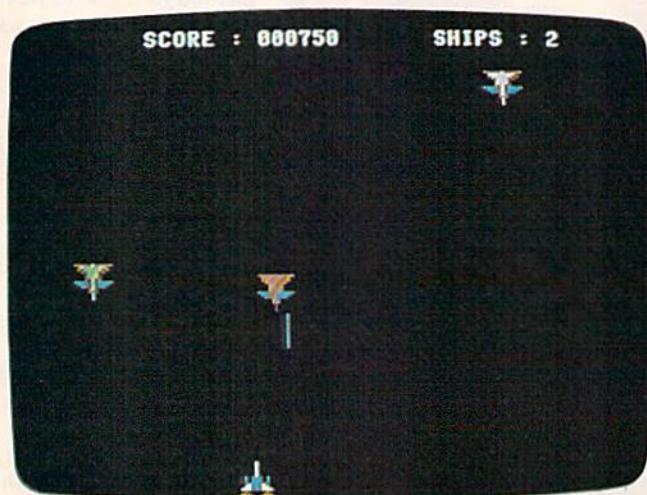
the number of waves you've eliminated. The longer you play, the more difficult the game. My highest score is 62,840. As a challenge, see if you can top this.

Typing In The VIC Version

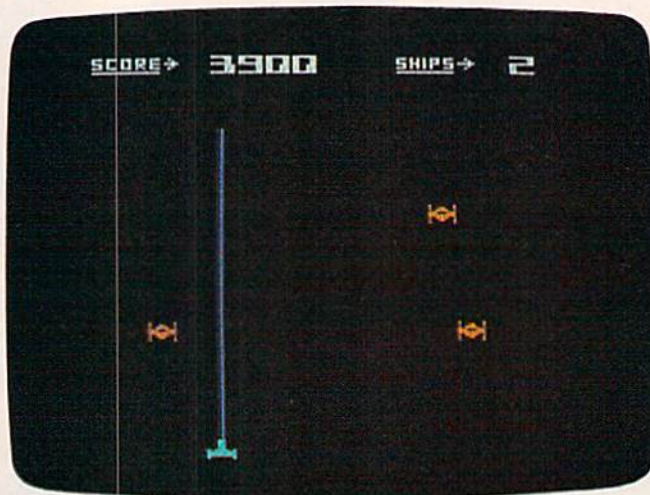
The VIC version of "Cosmic Combat" is in two parts. Program 1 POKEs custom characters into

memory and automatically loads and runs Program 2. If you're using tape, change the 8 to a 1 in line 19 of Program 1. Save Program 2 directly after the first program. Both disk and tape users should be sure to save Program 2 with the filename CC.

See program listings on page 188.



Defend your planet against the kamikaze Zirconian ships (64 version).



An invader dodges the pulsar cannon in the VIC version.

YOUR COMMODORE JUST GOT FOUR TIMES BETTER



DISQ: The fastest, most reliable, easiest-to-use C-64 disk and copy program.

- Fast format and 3 minute disk backup!
- With Copy-Q version 2.0: the ONLY TRUE C-64 full nibble copier that copies virtually everything!
- Autoboot on powerup and system reset button!
- Full file manager and disk editor with screen dump!

\$69.95



GPC: The full-featured C-64 Graphic Printer Cable that is software compatible.

- 100% Commodore printer compatible!
- Directly supports most popular printers!
- 2K buffer and year warranty!
- Users manual with software examples and Hi-Res machine language Screen Dump!

\$89.95



SPRINT PRINT: The full-functioned print buffer for the Commodore 64

- Gives you control of your printer while printing!
- Enhances the speed of your printer!
- Gives the 1525 and 801 printers true descenders and underlining!
- Remembers everything!

\$45.95



Q-TEAM: The full-featured, easy-to-use, C-64 terminal program at a breakthrough price.

- Full on-line disk support and printing!
- Full file up and download, autodial, and remote disk access!
- Sends, receives, and prints buffers and converts text, basic, and Compuserve™ files!
- Supports CBM™, Mitey-Mo™, Westridge™, and Hayes™, modems!

\$23.95



DISTRIBUTED BY RADIX MARKETING 5223 W. 73RD ST., MINNEAPOLIS, MN 55435. TO ORDER CALL (612) 831-1088

CAN YOU PEDAL FAST ENOUGH TO WIN THE GREAT MANCOPTER™ RACE?

Can you pedal fast enough to keep your human-powered copter up in the air?

Can you dodge blade-biting birds, strange swamp creatures and dastardly villains?

Can you keep your copter from falling into the mouths of hungry sharks and giant squids?

Can you fly through treacherous mangroves and lightning storms?

Can you take all this fun and frustration?

Then you're ready for the great Mancopter race.

For Commodore 64, Atari and IBM PC & PC/JR systems.

Premier
Arcades™



Datasoft®
WE
CHALLENGE
YOU.

Datasoft, Inc., 19808 Nordhoff Place,
Chatsworth, CA 91311 • Phone (818) 701-5161

Datasoft® is a registered trademark of Datasoft, Inc.
Premier Arcades™ is a trademark of Datasoft, Inc. © 1984
Mancopter™ is a trademark of Nichibutsu, USA © 1984
© 1984 Datasoft, Inc.

3-D Labyrinth

This game is a classic example of how a challenging game with good graphics can be written without a lot of code. It runs on the VIC (with or without expansion) and the 64.

Your goal in "3-D Labyrinth" is simply to make it through the maze. Sound easy? It isn't. You start in the northwest corner and must make your way to the exit in the southeast corner. The maze is different each time you play, so tracing your path in one game won't help when you play the next one.

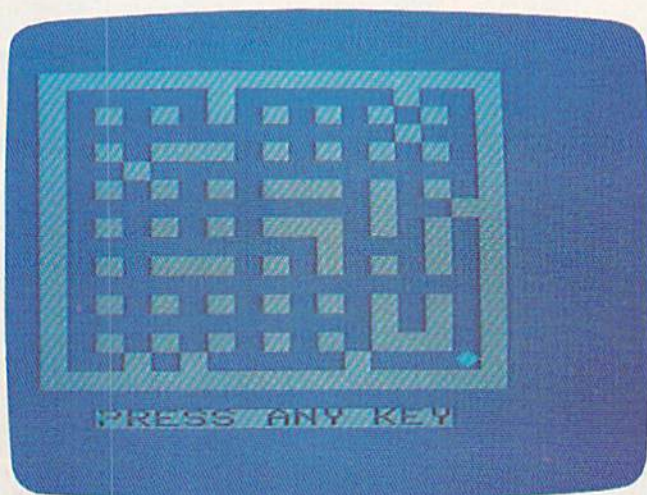
A Leisurely Stroll?

If you choose to just explore the maze, you can take a leisurely stroll, carefully plotting your course, and all in your own good time. Or you can play competitively by timing your trip through the maze and then seeing if you or a friend can beat that time in another game.

After typing in and saving the program, simply load and run. The screen blanks while the program constructs the maze, so you'll have a brief wait before the game starts. You begin in the northwest corner, where the wall is marked START. (The southeast exit is marked FINISH.) To face any direction, press S, N, E, or W. Throughout the game, the current direction is displayed lest you forget which way you're looking. To move in the direction you've chosen, press the space bar. You might want to use graph paper to map your moves.

If you start feeling hopelessly lost, help is at your fingertips. Press H to get a brief top view of the maze with your current position marked. If you're still unable to find your way out, press Q (Quit) to start again in a new maze.

When you make it to the FINISH marker, you must take a step south (S) out of the maze to win the game. You'll then be given the time used to complete the tour and a map of the maze.



If you're feeling lost, press H (for Help) to get a brief top view of your position in the labyrinth (VIC screen).

Programming Techniques

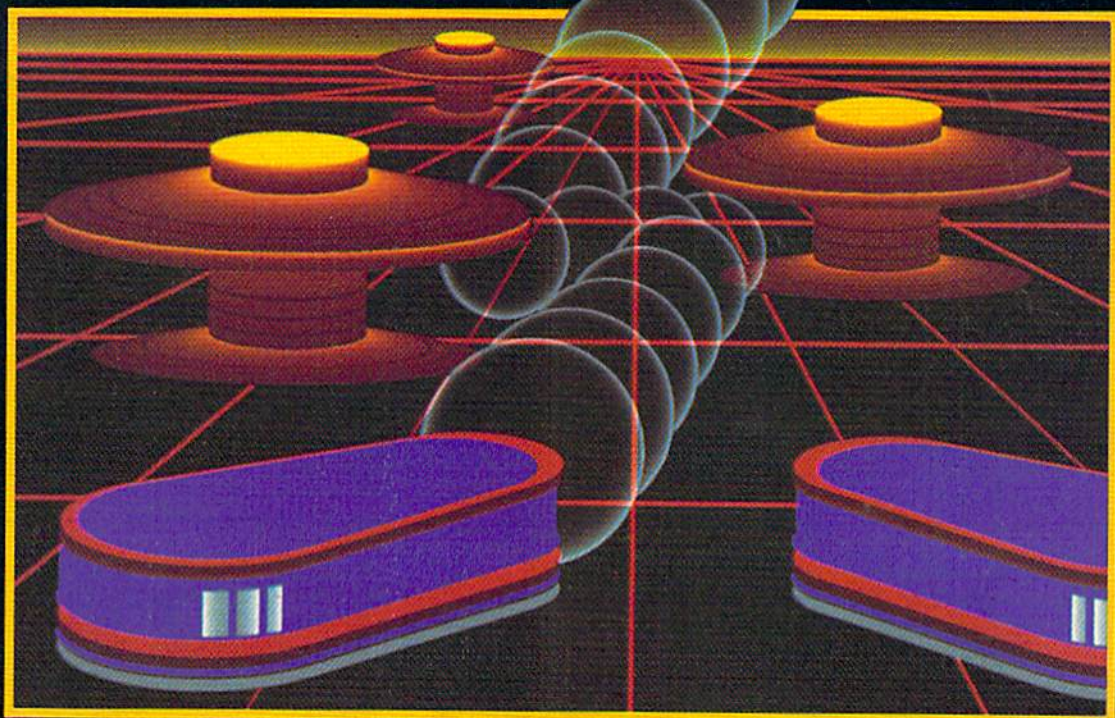
When I first wrote the program, I used POKEs to the screen. But after changing the POKEs to PRINTs, the game became faster and more memory efficient.

First, the background is PRINTed—in this case, a giant X with smaller pictures laid on top. This X represents the main corridor without any connecting (side) corridors. The computer then looks at the maze (created by an array) in the direction you are facing, and adds pictures of the appropriate side corridors. It first looks to the right and left to see if there are any side corridors. If so, the appropriate picture is PRINTed on either or both sides of the X.

Next, it checks to see if there is a wall in front of you. If so, it PRINTs the proper-sized square centered on the X. The size is determined by how far away the wall is from your present position. If there is no wall, the computer then

TAKE A BREAK!

For
Commodore 64



WITH NIGHT MISSION **PINBALL**

You deserve the best. You've earned it. Now reward yourself with a session of **Night Mission PINBALL**, the most realistic and challenging arcade simulation ever conceived! ■ Stunning graphics and dazzling sound effects put **Night Mission PINBALL** in a class by itself. Game features: multi-ball and multi-player capabilities, ten different professionally designed levels of play, and an editor that lets you create *your own* custom modes. ■ So take a break with **Night Mission PINBALL** from SubLOGIC. Winner of *Electronic Games* magazine's 1983 Arcade Award for Best Computer Audio/Visual Effects.

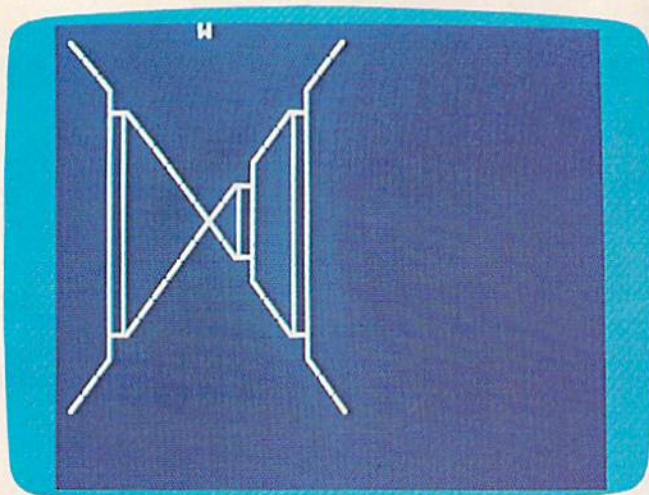


See your dealer . . .

or write or call for more information. For direct orders please add \$1.50 for shipping and specify UPS or first class mail delivery. Illinois residents add 5% sales tax. American Express, Diner's Club, MasterCard, and Visa accepted.

Order Line: 800/637-4983

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995



The player faces west with corridors ahead to the left and right (64 screen).

looks ahead two squares for two more side corridors. The program continues until the computer has looked five squares away from your current position.

After this process is completed, all of the in-

dividual pictures have overlapped in such a way as to simulate a 3-D effect.

As written, the goal is to simply finish the maze in the shortest time. Ambitious BASIC programmers might want to add some twists, perhaps a series of mazes with monsters, treasures, or puzzles to solve along the way.

Note To VIC Users

If you're typing the program into an unexpanded VIC, be very careful not to add any extra spaces as you enter the lines. The program just barely fits as is, with only a few bytes to spare. Any extra spaces could cause an OUT OF MEMORY ERROR.

See program listing on page 196. ☐

COMPUTE!'s Gazette
Toll Free Subscription Order Line
800-334-0868
In NC 919-275-9809

JIM BUTTERFIELD'S BEST C-64 SPELL CHECKER

FEATURING:

- Word Pro compatible
- Global File Check
- Multiple drives
- Customize your own dictionary disks
- Automatic document corrections with the wordprocessor
- "Bump free" loading – MSD – 2 compatible
- Over 30,000 words

49⁹⁵

Toll Free Order Line

1-800-387-3208



**PRO-LINE
SOFTWARE**

755 The Queensway East, Unit 8, Mississauga, Ontario, Canada L4Y 4C5 . Phone 416-273-6350

Science
Fiction**Fahrenheit 451 • Ray Bradbury**

010-10110-1-101

Science
Fiction**Arthur C. Clarke RENDEZVOUS WITH RAMA**

010-10110-1-101

FANTASY

DRAGONWORLDBYRON PREISS, MICHAEL REAVES
AND JOSEPH ZUCKER

010-10110-1-101

Science
Fiction
Adventure**MICHAEL CRICHTON**

010-10110-1-101

FANTASY

SHADOWKEEP

ALAN DEAN FOSTER

010-10110-1-101

Science
Fiction
Adventure**STARMAN JONES ROBERT A. HEINLEIN**

010-10110-1-101

Booted up any good books lately?

Disks for
Apple II® series and Commodore 64™

Introducing Trillium™ interactive software.

Maybe you've wondered what kind of software a giant like Bradbury or Crichton or Clarke could dream up. Maybe you've wondered what it would be like to be the hero in one of their mind-boggling adventures.

Or maybe you've just wondered if you'd ever see software that knocks you right out of your seat—and literally lands you in a whole new world.

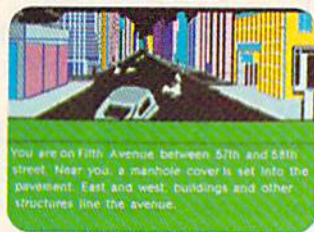
Well, now you can stop wondering. Because now there's Trillium. An entire line of games produced in collaboration with the greatest science fiction authors of our century.

An entire line of the most challenging, most exciting, most rewarding adventures ever created. Adventures that put you right in the center of action—and completely in command.

Only Trillium gives you programs like **Fahrenheit 451™**, Ray Bradbury's timeless masterpiece about one man's courage to defy a book-burning, repressive state. Only Trillium combines a line of classic fiction with state-of-the-art interactive features—features like full-color graphics, advanced text parsers, and the intense, realistic game play of multiple-disk programs. And only Trillium gives you these benefits in every single game.

Trillium. We give you more than great software.

We give you great books to boot.



You are on Fifth Avenue between 57th and 58th street. Near you, a manhole cover is set into the pavement. East and west, buildings and other structures line the avenue.

BASIC Magic

A Christmas Assortment

This month, we'll build a Christmas program with techniques learned in the previous two columns, and introduce some new programming tricks.

Most experienced programmers have a secret collection of programming tricks—simple techniques picked up over many years of trial and error, or learned from more advanced programmers. In the spirit of the holiday season, let's look at a Christmas assortment of simple tricks which are easy to code and can add a lot to your programs.

These examples work for the VIC, 64, and the new Plus/4 and 16.

Our "tricks" include a brief explanation of how CHR\$ codes are used, followed by some simple sound effects you can add to your BASIC programs, and, finally, a way to freeze your program until the user presses any key, or a specific key.

Let's start with one short program and build it up using some "Christmas magic."

Using CHR\$ Codes

First, look up the CHR\$ codes in the back of your owner's manual. They're listed in the ASCII and CHR\$ Codes chart in the appendices of your manual or *Programmer's Reference Guide*. As you can see, every key and symbol on your computer keyboard has its own CHR\$ value. For example, the CHR\$ number for the club symbol (like on a playing card) is 120. To see how it works, type these lines and press RETURN after each line:

```
PRINTCHR$(120)
FOR X=1TO22:PRINT CHR$(163);:NEXT
PRINT CHR$(28)"THIS IS THE COLOR RED."
```

The first line prints one "club" symbol on the screen. CHR\$(120) is exactly the same as the club symbol.

The next line uses a FOR-NEXT loop to PRINT the CHR\$(163) symbol 22 times. As you may recall from our previous lesson on FOR-NEXT, everything between FOR X=1 TO 22 and NEXT will be repeated 22 times. In this case, CHR\$(163) is the CHR\$ code for a horizontal line, so the horizontal line is printed 22 times. The semicolon causes all the symbols to appear right next to each other. Without it, each symbol would be printed on a separate line.

You can also use CHR\$ commands to change colors, as we did in the third line above, or to switch between upper- and lowercase.

Now, let's see how we can use a CHR\$ to clear the screen:

```
100 PRINT CHR$(147)
200 PRINT"PLEASE TYPE YOUR NAME AND PRESS
RETURN.":INPUT N$
300 PRINT CHR$(147)
400 PRINT"MERRY CHRISTMAS, "N$
```

Type RUN and press RETURN, then follow the instructions on the screen. Let's see how this program works:

Line 100 clears the screen. Printing the CHR\$(147) is the same as printing the "clear screen" character (SHIFT-CLR/HOME).

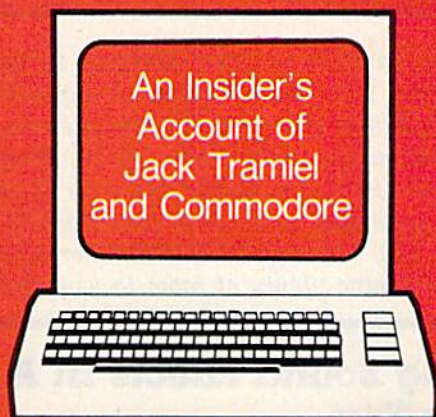
Line 200 prints a message on the screen. The INPUT command tells the computer to put a question mark on the screen, wait until something has been typed, and then assign the variable N\$ to stand for whatever was typed. For example, if you typed your name, the variable N\$ is the same as your name.

Line 300 clears the screen again so the second message in line 400 appears all by itself.

Line 400 prints the MERRY CHRISTMAS message, followed by your name. Notice that N\$

Available November 15 from COMPUTE! Books

THE HOME COMPUTER WARS



by Michael Tomczyk

\$16.95 hardback ISBN 0-942386-75-2

\$9.95 trade paperback ISBN 0-942386-78-7

COMPUTE! Publications, the leading home computer publisher, brings you the exciting story of the home computer industry. This book takes the reader into a vivid, dramatic world where a powerful, brilliant businessman almost single-handedly fashions the American consumer computer industry.

A survivor of the Nazi Holocaust, Jack Tramiel took a tiny typewriter parts company and built it into a major American corporation. In the process, he became a modern corporate legend. Some of his vice presidents thought he was a saint; some thought he had the world's hardest heart. But few deny the brilliance of this complex entrepreneur.

For the past four years, Michael Tomczyk has been Tramiel's right hand man. Throughout Commodore's explosive rise to leadership in the computer field, Tomczyk was a close insider. And, most importantly, Tomczyk is a keen observer and takes you where the action is.

To order your copy, send the attached card, with your payment, to COMPUTE! Books, P.O. Box 5406, Greensboro, NC 27403 or call toll-free 1-800-334-0868.

Add \$3.00 shipping and handling to hardback copy; add \$2.00 shipping and handling to trade paperback.

is *outside* the quotation marks. Variables are always used outside quotation marks. The comma, however, is *inside* quotation marks, so it will be printed as the comma character. Try putting the comma outside of the quotation marks, just before N\$.

REM: *In our first program example, we numbered the lines 100, 200, 300 because numbering the lines by 100 lets us insert more lines later on. Most programs are numbered by tens—10, 20, 30 and so on—but if you think you might add a lot of lines later, it's a good idea to number your lines by 20, 50, or even 100. The highest line number allowed is 63999, so you have plenty of room to work with.*

Creating Sound Effects In A Line Or Two

Did you ever write a program and wish you could include just a simple "bleep" or other short sound effect? Let's see how easily this can be done. Below are simple one and two line statements you can use in your own programs. Find the one appropriate for your computer, type it in, and press RETURN.

For the VIC:

```
150 POKE 36878,15:POKE 36876,160:FOR T=1T
    0200:NEXT:POKE 36876,0
```

For the 64:

```
150 POKE 54296,15:POKE 54276,33:POKE 5427,9:POKE 54278,0
151 POKE 54273,51:POKE 54272,97:FOR D=1TO
    200:NEXT:POKE 54276,0
```

For the Plus/4 and 16:

```
150 VOL 7:SOUND 1,460,60
```

After typing the sound effect line for your computer, type LIST and press RETURN to make sure the sound effect line has been added to your program. For example, if you have a 64, your new program should look like this:

```
100 PRINT CHR$(147)
150 POKE 54296,15:POKE 54276,33:POKE 5427,9:POKE 54278,0
151 POKE 54273,51:POKE 54272,97:FOR D=1TO
    200:NEXT:POKE 54276,0
200 PRINT"PLEASE TYPE YOUR NAME AND PRESS
    RETURN.":INPUT N$
300 PRINT CHR$(147)
400 PRINT"MERRY CHRISTMAS,"N$
```

Now, type RUN and press RETURN to see how the program works. (Make sure the volume control on your TV or monitor is turned up.) Presto—you've just added sound to your program.

Using GOSUBs To Repeat A Sound Effect

You can repeat a sound effect as many times as you like, but if you use it more than once, you'll probably want to use a GOSUB command with a RETURN.

The GOSUB command tells the computer to GO to a SUBroutine, execute that routine, and then when it's done, RETURN to its original position and continue on with the program. Using the GOSUB command means you can jump down to a program line and use it over and over again. The obvious advantage to using this command is that you don't have to retype the line every time you want to use it. Here's how it would work with the 64:

```
50 GOSUB 990
100 PRINT CHR$(147)
200 PRINT"PLEASE TYPE YOUR NAME AND PRESS
    RETURN.":INPUT N$
250 GOSUB 990
300 PRINT CHR$(147)
400 PRINT"MERRY CHRISTMAS,"N$
450 GOSUB 990
900 END
990 POKE 54296,15:POKE 54276,33:POKE 5427,9:POKE 54278,0
991 POKE 54273,51:POKE 54272,97:FOR D=1TO
    200:NEXT:POKE 54276,0
992 RETURN
```

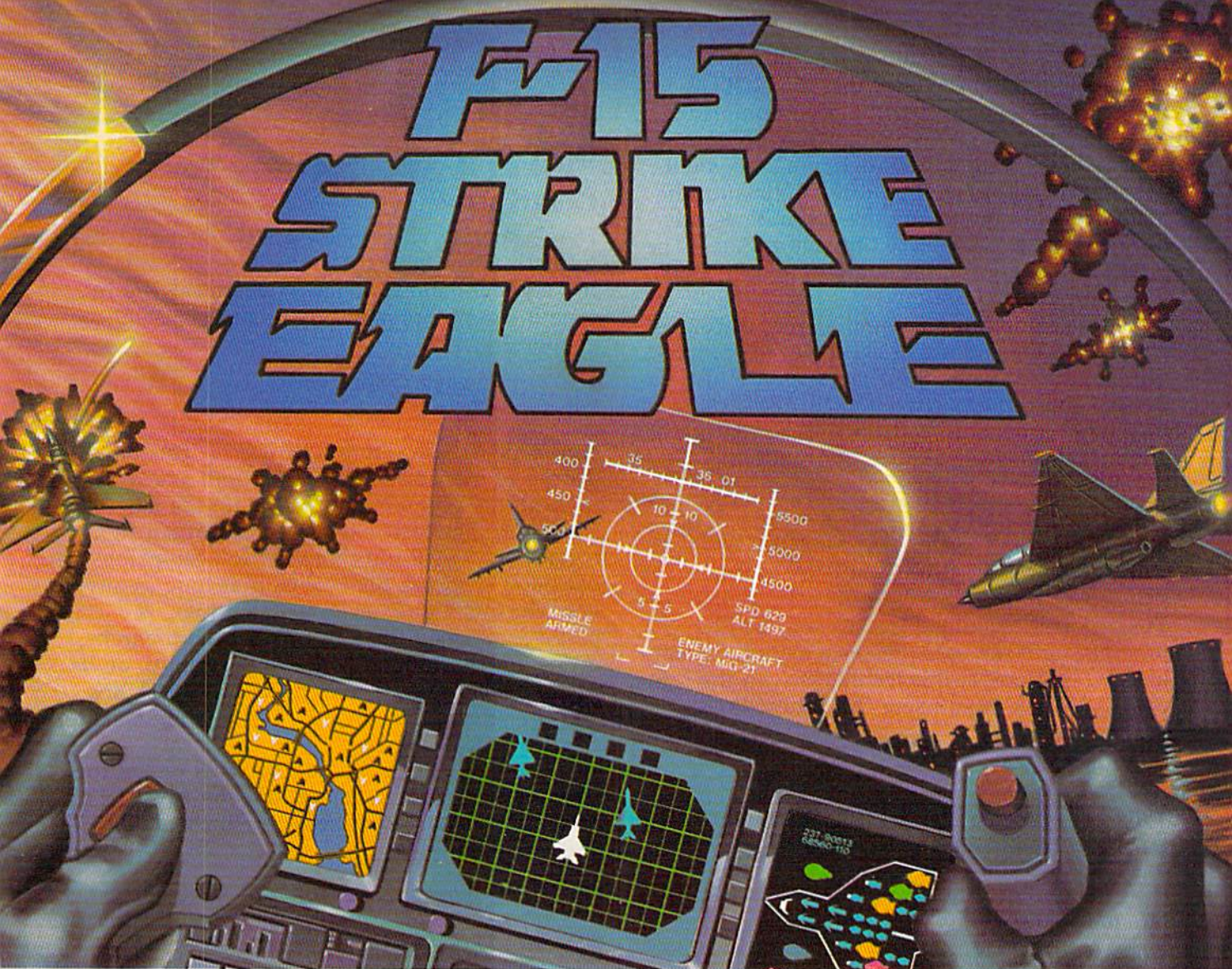
If you have a Commodore 64, change lines 150 and 151 to lines 990 and 991 as shown. To do this, LIST the previous program, cursor up to the beginning of line 150 and type 990, then press RETURN. Then position your cursor at the beginning of line 151, type 991, and press RETURN. Now LIST again, and you'll see the two lines 990-991 at the end of the program. To get rid of line 150, type a 150 all by itself. Entering a blank program line erases that line from memory. Do the same for line 151.

If you have another Commodore computer, change line 150 to line 990 using the same technique (of course, you won't have a line 991 because the 64 has a two-line sound effect and yours only requires one line).

So how does this program work?

The GOSUB command in lines 50, 250, and 450 tells the computer to jump down to line 990 and execute whatever follows (which is your sound effect). When the computer reaches the RETURN command in line 992, it jumps back up to where it left the program, and continues from that point. In this program, the computer plays the sound effect, clears the screen, PRINTs a message and accepts an INPUT, plays the sound effect, then clears the screen again, PRINTs the MERRY CHRISTMAS message, and plays the sound effect one more time before coming to the

F-15 STRIKE EAGLE



Put a \$20,000,000 Thrill in your Computer!!!

The F-15 STRIKE EAGLE, one of the world's most sophisticated fighters, costs the Air Force more than \$20,000,000.00 each. Now you too can strap into your ejection seat and prove how good you really are in exciting modern jet fighter combat. Fly combat missions, engage enemy aircraft, and destroy enemy ground targets from historic missions over Southeast Asia to today's defense of the strategic oil routes through the Straits of Hormuz.

F-15 STRIKE EAGLE (simulator) has all the features that makes the real EAGLE the great fighter aircraft it is — afterburners, multiple radars, air to air missiles, high explosive bombs, cannon, drop tanks, Electronic Counter Measures (ECM) flares, electronic ground tracking maps, Heads Up Display (HUD), outstanding 3-dimensional cockpit visibility, and realistic F-15 maneuverability. Your mission is to take off from your base, fly to and destroy your primary target through all the dangers of enemy territory including Surface to Air Missiles and enemy aircraft. Of course, you have to get back home again, too!!

F-15 STRIKE EAGLE is a very real simulation, accom-

plished with the guidance of real fighter pilots, and includes seven different combat missions, four skill levels, and an infinite number of exciting scenarios. F-15 will thrill and challenge you and give you the chance to prove you have the "Right Stuff" of an EAGLE fighter pilot!!

F-15 STRIKE EAGLE is available for Commodore 64, ATARI (48K), and Apple II (64K) computers. Suggested retail price is only \$34.95. Find STRIKE EAGLE at your local retailer, or call or write for MC/VISA, or COD orders. Add \$2.50 for Postage and Handling (Int'l add \$4.00USD). MD residents add 5% sales tax.

Experience the reality of these other great simulations from MicroProse



As close to the Real Thrill of Flying as You Can Handle!!!



Heart Pounding Accelerated Real-Time Defense of Europe Against Soviet Invasion!!!



Sensational Assault Chopper Rescue Raids for Daring Pilots!!!

MicroProse Software

The Action is Simulated — the Excitement is REAL!!

10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151

end of the program. Notice that the GOSUB and RETURN lines come *after* the END command. Try removing line 900 (type a 900 with nothing after it) and running the program again; you'll get an error message. By putting END after the main program, but before the subroutines, we have created a "safe place" for subroutines. The program will execute the subroutine only when you want it to.

You can do fancier sound effects, of course. Any sound effect, long or short—even songs—can be inserted using the techniques we just discussed. You can also use GOSUB-RETURN to repeat other actions as well, such as screen titles, graphics displays, "rewards," or random numbers.

"Press Any Key To Continue"

Did you ever see a BASIC program that instructed you to PRESS ANY KEY TO CONTINUE? This technique freezes your BASIC program until the user presses a key on the keyboard. Let's look at this technique with the same program we've been using. Add these lines:

```
280 PRINT "PRESS ANY KEY"
285 GET K$:IF K$="" THEN 285
```

Type LIST and press RETURN. If you have a 64, your new program should look like this (if you have another computer your program should look pretty much the same, only 990 will be different and there's no 991).

```
50 GOSUB 990
100 PRINT CHR$(147)
200 PRINT "PLEASE TYPE YOUR NAME AND PRESS
RETURN.":INPUT N$
250 GOSUB 990
280 PRINT "PRESS ANY KEY"
285 GET K$:IF K$="" THEN 285
300 PRINT CHR$(147)
400 PRINT "MERRY CHRISTMAS, "N$
450 GOSUB 990
900 END
990 POKE 54296,15:POKE 54276,33:POKE 5427
7,9:POKE 54278,0
991 POKE 54273,51:POKE 54272,97:FOR D=1 TO
200:NEXT:POKE 54276,0
992 RETURN
```

Line 280 prints a prompt message telling the user to press any key on the keyboard. Line 285 contains a GET statement which works like this. First it tells the computer to GET K\$, which means "check the keyboard and see if a key is being pressed—the next key that is pressed will be called K\$." The second part of the line tells the computer, "If *no key* is being pressed, then keep going back to line 285 and checking to see if a key is pressed." The GET statement, together with the IF-THEN test, makes the computer check the keyboard over and over again and

"freezes" the program there until a key—any key—is pressed.

"Press A Specific Key To Continue"

Here's another variation which requires the user to press a *specific key*. Change lines 280 and 285 by retyping them as follows (whenever you retype the same program line, it automatically changes):

```
280 PRINT "PRESS THE LETTER C TO CONTINUE"
285 GET K$:IF K$<>"C" THEN 285
```

Now type RUN and press RETURN. This time, instead of freezing the program until *any* key is pressed, the program is frozen until the letter C is pressed. The less than and greater than signs together (<>) tell the computer to keep going back and checking the keyboard as long as any key which is higher or lower than the C is pressed, so when the C is pressed the program drops down to the next line and continues on its merry way. The statement IF K\$<>"C" THEN 285 is equivalent to saying, "If K\$ is not equal to C, then repeat line 285."

You can require the user to press one of the function keys, too. Let's use function key 1 (f1) to get our response this time. We'll change lines 280 and 285:

```
280 PRINT "PRESS FUNCTION KEY 1 TO CONTINUE"
285 GET K$:IF K$<>CHR$(133) THEN 285
```

See how we used the CHR\$ number in line 285? In this case, we use the CHR\$ number to tell the computer to check to see if the function key is being pressed. This is one of the most important applications of CHR\$—to define a key in conjunction with the GET statement.

Reading the function keys is a little more complicated on a Plus/4 and 16, so the two lines above will not work properly.

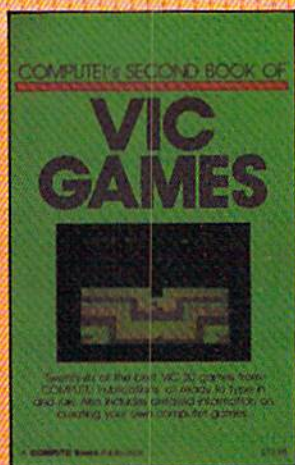
A Look Ahead At Random Numbers

In an upcoming column we'll explore how random numbers work, but just to take a glimpse ahead, here's a program to try in the meantime:

```
10 X$="{BLK}{WHT}{RED}{CYN}{PUR}{GRN}
{BLU}{YEL}"
20 X=INT(8*RND(1))+1
30 PRINTMID$(X$,X,1){RVS} ";
40 GOTO 20
```

{BLK} means hold down the CTRL key and press the color key marked BLK (the 1 key) at the same time. The other characters in line 10 are obtained with CTRL and one of the other color

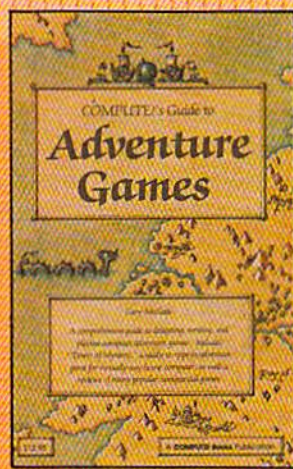
COMPUTE! BOOKS



COMPUTE!'s Second Book of VIC Games

There's an exciting mix of chases, challenges, and puzzlers in this collection of games for the VIC. It includes many of the most popular games from recent issues of *COMPUTE!* and *COMPUTE!'s Gazette*, as well as several that have never before been published. Whether you want to explore misty dungeons, take on hostile aliens, unravel stimulating brainteasers, or even learn how to create games of your own, *COMPUTE!'s Second Book of VIC Games* is for you.

\$12.95
ISBN 0-942386-57-4
August



COMPUTE!'s Guide to Adventure Games

Gary McGath

A complete guide to the world of text adventures. Chapters discuss what goes into a good text adventure and show you how to create adventure games of your own. You'll also find reviews of many of the most popular text adventures. There's even a complete adventure program—"Tower of Mystery"—that's ready to type in and run on virtually all popular home computers. If you enjoy playing or creating text adventure games, this is the book for you.

\$12.95
ISBN 0-942386-67-1
September

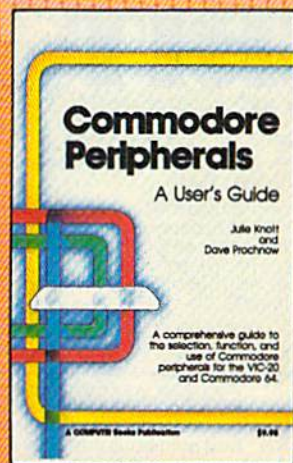


VIC-20 and Commodore 64 Tool Kit: BASIC

Dan Heeb

This comprehensive guide to the BASIC ROM routines in the VIC 20 and Commodore 64, thoroughly documented and clearly written, shows programmers how to call these routines from their own BASIC or machine language programs. Not only a "how-to," the *Tool Kit* is also an extensive reference guide to this important part of Commodore BASIC. For intermediate to advanced programmers.

\$16.95
ISBN 0-942386-32-9
September



Commodore Peripherals:

A User's Guide

Julie Knott and
Dave Prochnow

This easy-to-understand book guides the computer owner through the myriad of Commodore peripherals available for the 64 and VIC-20. Clear descriptions explain the use and function of disk drives, printers, expanders, cartridges, Datassette, modems, and CP/M. For all VIC and 64 users who plan to add to their basic computer system.

\$8.95
ISBN 0-942386-56-6
October

To order your copy, call toll-free **1-800-334-0868** or write:
COMPUTE! Books, P.O. Box 5406, Greensboro, NC 27403

keys. See the article "How To Type In COMPUTE!'s GAZETTE Programs" for more details. Here's a brief explanation of how this program works:

Line 10 defines X\$ as the group of colors inside the quotation marks. Remember, in most cases a string variable is a letter followed by a dollar sign. String variables can be used to define a color as well as letters, graphics symbols, keyboard commands, and numbers not used as values.

Line 20 defines the numeric variable X as a random number. The random number formula is given to the right of the equal sign. INT makes the random number a whole number. The number 8 is the *upper limit* from which the random numbers are chosen, and the number 1 at the end of the line is the *lower limit*.

Line 30 tells the computer to print a character from the middle of the X\$ grouping of colors in line 10. The X in parentheses designates how many characters over from the left of X\$ the computer should go to choose the color in the group. But since this number is *random*, it could be the first, second, third, fourth, fifth, sixth, seventh, or eighth number. Whichever number it is, that's the color that will be used when the computer goes on in the same line to print a *reverse space* ({RVS} means hold down the CTRL key

and press the RVS ON key at the same time). A reverse space is always printed on the screen as a solid block. The semicolon at the end of line 30 makes the reverse spaces (the blocks) print one after the other.

Incidentally, printing reverse spaces is one way to draw solid bars across the screen, or to make solid squares in different colors.

Line 40 tells the computer to go back to line 20 and choose another random number, after which the computer continues with line 30 and prints another solid square, again in a color chosen at random.

The result of all this is a multicolored pattern.

Here's a challenge for you to work on until next month. See if you can write a program, like the one above, that prints a color at random, then a reverse block. Next, using a different string variable, print a cursor movement (up, down, left, or right) at random and go back to pick a new color. Instead of printing characters one after another, the cursor will seem to wander randomly around the screen.

This month, we jumped ahead a little. We'll flesh out many of these programming concepts and techniques in upcoming columns, but until then, experiment with these programs. You might be surprised at what can be accomplished with so little programming. Happy Holidays! ☺

RABBIT

For the 64 or VIC

\$39.95

Alternative to the 1541 Disk Drive!

Load or save 8K in 30 seconds! It's less expensive than disk and can even be used as a backup to the flaky 1541!

Yes, the RABBIT is that and much more. Uses the Commodore cassette deck but loads and saves much, much faster than regular Commodore load/save. Think about it — loads or saves an 8K program in almost 30 seconds, 16K in 1 minute, etc. That's nearly as fast as the 1541 disk. RABBIT is on cartridge so it's always there. Also has other useful commands. Specify for use on the 64, or on the VIC 20 —

"It was the best purchase for my computer that I have ever made!"

"Congratulations on your 64 Rabbit. It's a super piece of work."

MAE NOW THE BEST FOR LESS!

Please for your own protection consider the MAE first before you buy that other assembler. We've had numerous customers who

wasted their money on some cheaper off brand assembler tell us how much better the MAE is.

The most powerful Macro Assembler/Editor available for the Commodore 64 and other CBM/PET computers, and also for the ATARI 800/XL and Apple II/III.

MAE includes an Assembler, Editor, Word Processor, Relocating Loader, and more all for just \$59.95.

We could go on and describe the MAE but we thought you would like to read our customers' comments. The following are actual unedited comments from correspondence about the MAE:

"Excellent Development Package."

"I like MAE and wish that you had it on the Macintosh!"

"Compares to DEC and INTEL."

"It is a superb program."

A Star is Born.

TelStar 64™
by Eastern House

A Communications Cartridge
for the Commodore 64.

Upload/Download, Status Line, etc. Works with your Commodore 1600 or 1650 Modem. Auto-dialing, etc. when used with the new CBM 1650 Modem.

Cartridge and Manual — \$49.95

Eastern House

3239 Linda Dr.
Winston-Salem, N.C. 27106
(919) 748-8446
Send for free catalog!

VISA®

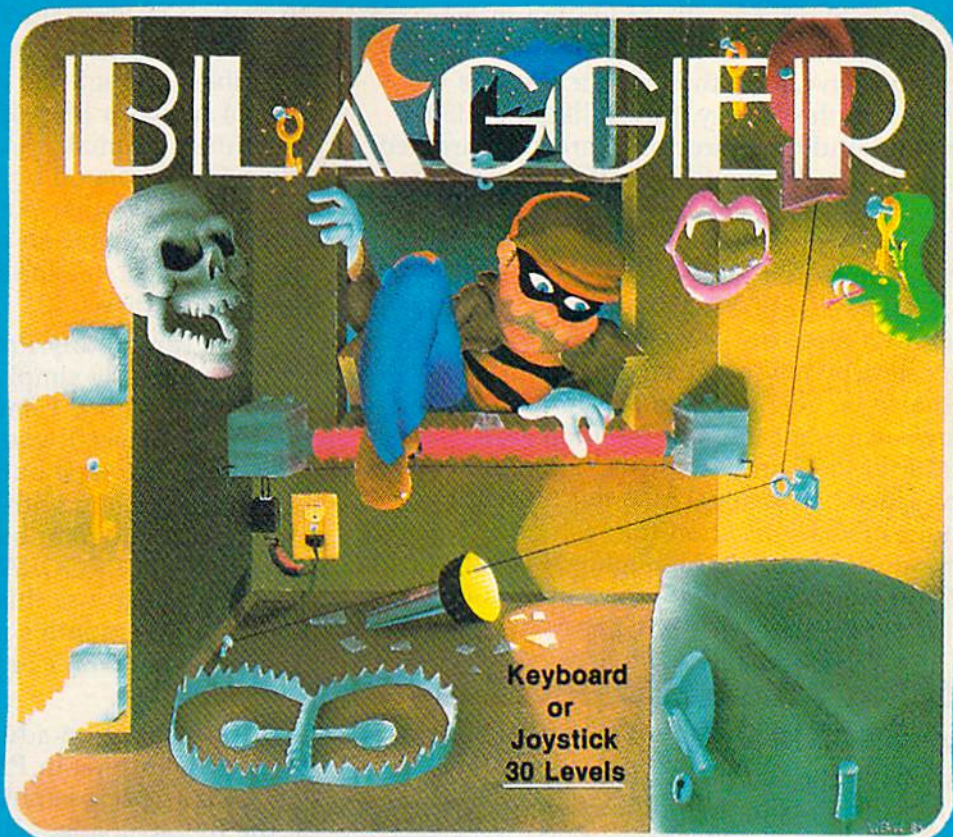
MasterCard

GRAB THE GOLD.

TOP TEN IN BRITAIN!!



TWO OF MANY
GREAT SCREENS.



Keyboard
or
Joystick
30 Levels

Follow the crazy exploits of ROGER THE DODGER, master burglar, as he works his way through the numerous "secure" buildings - searching for the golden keys, robbing safe after safe but always on the alert to the many amazing obstacles, tough alarm systems, and those spooky, cooky night watchmen.



NET SOFTWARE
5763 - 203A STREET, LANGLEY, B.C.
CANADA; V3A-1W7. (604) 530-3161

RECREATIONAL and EDUCATIONAL SOFTWARE
for YOUR C-64

WATCH FOR
IT!!

SON OF BLAGGER
SOON TO BE RELEASED - HOT!



KILLER WATT



SPELLING TUTOR

MACHINE LANGUAGE FOR BEGINNERS

Richard Mansfield, Senior Editor

Customizing

One of the many benefits of writing in machine language is that you can get inside your computer and have it do things your way. As it comes from the factory, things like the LIST command and disk directories are standardized. If you want a different kind of listing or directory, you've got to make your own.

Let's create a disk directory that we can manipulate to suit ourselves. Instead of LOAD "\$",8 we can just SYS 830 and see a complete, condensed directory—even on the VIC screen. It won't destroy any program already in RAM. We'll also be able to make any formatting changes we want. Should the filenames be divided into PRG and SEQ lists? Should there be more space between each name? Should the amount of space used on the disk be eliminated from our directory, or highlighted? Whatever format you want, whatever information you need, can be set up the way *you* want it.

Adding Automatic Disk Save To The Simple Assembler

If you have the Simple Assembler, published in the November column, you can type in Program 2 and it will be directly entered into your computer. Then, to save it to disk for future use, type NEW (to get rid of the Assembler) and enter Program 4. Program 4, from an idea by Charles Brannon, can be used to save any machine language program to disk, provided you know the starting and ending addresses. The ML program can then later be loaded with the usual LOAD "filename",8,1.

If you are using the Simple Assembler, you might want to add Program 4 to it as a subroutine. You can use the Simple Assembler variables TA (starting address) and SA (ending address) instead of the INPUT statements in lines

30 and 40 of Program 4. This would make saving your ML routines automatic from within the assembler. It might be convenient to insert Program 4 between lines 250 and 260 of the Simple Assembler. To make SAVEs optional, you could add a SAVE pseudo-op, similar to the END pseudo-op. Another possibility is using save-with-replace if you do a great deal of testing and want the latest version of your routine to always be saved to disk.

You can modify Program 4 to save ML programs to tape by simply changing line 20. Replace the 8 with a 1 and omit the 0: before the filename. As usual, you must avoid putting programs into the tape buffer. A minor quirk of using this method with tape is that when you load an ML program back into memory, you will see FOUND "PROGRAMNAME" twice on the screen. You can use this method for tape saves, but since this month's main program reads a disk directory, you won't be able to use it without a disk drive.

If you have an advanced, label-based assembler, you can type in Program 1 and assemble it. If you have no assembler at all, type in Program 3, the BASIC loader.

When learning machine language, it's often helpful to go through someone else's program step-by-step to see how loops and branches and variables are handled. Let's look at Program 1 and see how machine language is written for an advanced assembler. Program 1 is *source code* (what you write) which the assembler will then translate into *object code* (a runnable program). This source code is written for the LADS assembler in my new book, *The Second Book of Machine Language* (COMPUTE! Books), but would work on most assemblers with few changes. For example, some assemblers use a pseudo-op EQU

THE NEW BREED



Mimic introduces instant evolution!
Meet the Spartan™ — the missing link
that turns your Commodore 64™
into a whole new apple.
The Spartan™ now allows you to use
any of the Apple™ II/II+ hardware
and software you want.
Now, **that's** natural selection!



MIMIC

FOR INFORMATION
PLEASE WRITE TO:
MIMIC SYSTEMS INC.
1112 FORT ST., FL. 6J
VICTORIA, B.C.
CANADA V8V 4V2

Commodore 64 and Commodore logo are trademarks of Commodore
Electronics Ltd. and/or Commodore Business Machines, Inc.
Apple® II and Apple® II+ are trademarks of Apple Computer, Inc.
Spartan™ is a trademark of Mimic Systems Inc., and has no association with
Commodore Electronics Ltd. or Apple Computer, Inc.

Program 1: Full Source Program For Commodore 64 Easydir

```
10 *= 830
20 ;-----
30 ;           EQUATES AND DEFINITIONS FOR COMMODORE 64
40 ;-----
50 FNAMELEN = $B7;      LENGTH OF FILENAME FOR OPEN A FILE
60 FNAMEPTR = $BB;     POINTER TO FILENAME LOCATION IN RAM.
70 FNUM = $B8;         CURRENT FILE NUMBER FOR OPEN, GET & PUT CHARS TO DEVICE
80 FSECOND = $B9;     CURRENT SECONDARY ADDRESS FOR OPEN
90 FDEV = $BA;         DEVICE NUMBER (8 FOR COMMODORE DISK)
110 OUTNUM = $BDCD;    PRINTS OUT A NUMBER--A HOLDS (MSB), X (LSB)
120 OPEN = $E1C1;     OPENS A FILE
130 CHKIN = $FFC6;    OPENS A CHANNEL FOR READ (HAVE FILE# IN X)
140 CHARIN = $FFE4;   PULLS IN ONE BYTE
150 PRINT = $FFD2;    SENDS OUT ONE BYTE
160 CLRCHN = $FFCC;   RESTORES DEFAULT I/O
170 CLOSE = $FFC3;   CLOSE FILE (FILE# IN A)
180 ;-----
190 ;           INTIALIZATION -- OPEN DIRECTORY. PRINT DISK NAME & ID
200 ;-----
210 JSR OPEN1
220 JSR CLRCHN:LDX #1:JSR CHKIN; OPEN FILE CHANNEL FOR READING
230 JSR CHARIN:JSR CHARIN; THROW AWAY START ADDR BYTES
240 LDY #29:LOOP JSR CHARIN:JSR PRINT:DEY:BNE LOOP:LDA #13:JSR PRINT
250 JMP CLOSEQUOTE
260 ;-----
270 ;           MAIN LOOP -- PULL IN ALL FILENAMES & PRINT THEM
280 ;-----
290 QUOTE JSR PRINTIT
300 OPENQUOTE JSR CHARIN:CMP #13:BEQ CLOSENOW:CMP #34:BNE OPENQUOTE
310 LOOP1 JSR CHARIN:CMP #34:BEQ CLOSEQUOTE
320 JSR PRINT:JMP LOOP1
330 CLOSEQUOTE JSR CHARIN:BEQ ENDTEST:CMP #42:BNE CLOSEQUOTE
340 JSR PRINT:JSR PRINT:JMP CLOSEQUOTE
350 ENDTEST JSR CHARIN:JSR CHARIN:JSR CHARIN:STA SIZE+1:JSR CHARIN:STA SIZE
360 JMP QUOTE
370 CLOSENOW LDA #"F:JSR PRINT:LDA #"R:JSR PRINT:LDA #"E:JSR PRINT
380 LDA #1:JSR CLOSE:JSR CLRCHN; RETURN TO BASIC
390 RTS
400 ;-----
410 ;           SUBROUTINE -- PRINT OUT THE BLOCKS-USED NUMBER
420 ;-----
430 PRINTIT LDA #32:JSR PRINT
440 LDA SIZE:LDX SIZE+1:JSR OUTNUM:LDA #45:JSR PRINT:RTS
450 ;-----
460 ;           SUBROUTINE -- TO OPEN 1,8,0,"$0" FOR READING DIRECTORY
470 ;-----
480 OPEN1 JSR CLRCHN
490 LDA #1
500 STA FNUM;           FILE#
510 LDA #8
520 STA FDEV;          DEVICE NUMBER
530 LDA #0
540 STA FSECOND;      SECONDARY ADDR
550 LDA #2:STA FNAMELEN
560 LDA #<FNAME:STA FNAMEPTR:LDA #>FNAME:STA FNAMEPTR+1
570 JSR OPEN; ROUTINE WITHIN BASIC THAT OPENS UP A NEW FILE
580 RTS
590 ;-----
600 FNAME .BYTE "$0"
610 SIZE .BYTE 0 0;    SPACE TO HOLD "SIZE" VARIABLE
```

Program 1a: Changes To Create A VIC Version

```
20 ;-----
30 ;           EQUATES AND DEFINITIONS FOR VIC
40 ;-----
110 OUTNUM = $DDCD;    PRINTS OUT A (MSB), X (LSB) NUMBER
120 OPEN = $E1BE;     OPENS A FILE (3 BYTES PAST NORMAL OPEN IN ROM)
```


BEFORE LOADING YOUR SOFTWARE
MAKE A PERFECT BACKUP WITH

DiskMaker™

with
MasterKey

99%
EFFECTIVE

THE AUTOMATIC DISK BACKUP SYSTEM FOR YOUR 64 & 1541 DRIVE!

- Actually copies a FULL disk in only 4 MINUTES!
- Easiest to use – TOTALLY automatic copy utility
- State of the "ARTS" copy capability!
- UNLOCKS protected disks for backup copying
- Breaks through LATEST protection schemes
- Includes FAST copier, "ARTS" copier and TRUE Nibbler: you get 3 copiers for the price of 1
- HALF-TRACKING up to & including track 40!
- 100% machine code for fast, RELIABLE operation
- 4 min. copier AUTOMATICALLY puts "errors" on copy
- Fastest & most advanced copier you can buy
- Writes errors 20,21,22,23,27, & 29 WHILE COPYING!
- Transforms your 1541 into a SUPER-FAST copy drive!
- NO analysis required, just swap disks & NO damaging drive knock during errors or format
- Formats AS IT COPIES, detects & reproduces NON-STANDARD formats & I.D. mismatch, DOS flags
- PRODUCT SUPPORT tel. #, revisions, & upgrades

OVER 500% FASTER THAN OTHER COPIERS!



ONLY

\$49.95

To order CALL **805-687-1541 ext. 64**
Technical line 805-682-4000 ext. 99



for entire system

For rush service call 24 hr. order line or send cashiers check/money order. Visa, MasterCard, & American Express include card# and exp. date. CA residents add 6% tax. Allow 2 weeks for clearance of personal & co. checks. Add \$3.50 shipping & handling for continental U.S./\$5.50 for UPS air. AK, HI, APO, FPO, CANADA add \$7.50. Other Foreign orders add \$8.50. All APO, FPO, & orders outside 48 states must be paid by certified U.S. funds. C.O.D.'s shipped to U.S. addresses only, add \$4.00. School orders welcome.

DISKMAKER PAYS FOR ITSELF THE FIRST TIME YOU USE IT!

basix

instead of the equals sign (=). If you have such an assembler, make the appropriate substitutions.

Line 10 establishes the start address. This is where the assembler will put the ML program. Then there are a series of variable definitions (called *label equates*) where a name is given to various important addresses within the computer. Between lines 50-170, we label all the memory locations which are used to open and close a disk file; read bytes off the disk; and print characters or numbers to the screen. Once we've defined these variables, we can then use just the label name instead of the number throughout the rest of the program. We can say JSR PRINT instead of JSR \$FFD2.

In line 210 we jump to a subroutine (situated between lines 480 and 580) which will open a disk file for reading. This particular file is a special one which is named "\$0" and holds the directory of the disk. As you can see, we store 1-8-0 into the appropriate locations, store a 2 into the location which holds the length of our filename, and then set up a *pointer* to the filename. A pointer just holds (in two bytes) the address of some other thing in the computer. A pointer could, for example, point to the start of screen RAM. In this case, we want it to point to the \$0 in line 600. We don't yet know, however, at which address this \$0 will be when the program is finally assembled. So, we give line 600 a label of its own, FNAME, and point to it using #< for the low byte and #> for the high byte. (These #< symbols are special assembler directives to fetch low and high bytes of labels.) After loading and storing (LDA/STA) these bytes into the pointer, we then, in line 570, JSR to the routine in BASIC ROM that opens a disk file. The RTS in 580 ends the OPEN1 subroutine, sending the program back to the main routine.

Opening A Channel

Next (line 220), we clear all channels and, loading X with a 1, we open a channel to file #1. (This is distinct from opening a file. We've already done that. This is closer to the action of INPUT#1.) We are now ready to use CHARIN to pull in bytes from our opened file. However, the first two bytes are pointers the disk drive uses, so we throw them away (line 230).

Now we want to pull in the next 29 characters and print them. This will be our disk name and disk ID number. We set up a loop (line 240) which will get a character, print it to the screen, lower our Y counter by 1 (DEY) and branch back if Y is not yet equal to zero (BNE). Then we LDA #13 and print that, causing a carriage return on screen. And finally, we jump into the main part of the program at a location called

CLOSEQUOTE.

The way it's set up, this routine will look for quotation marks and print whatever is between them, but not what's outside of them. The information streaming in to us from the directory file will look something like this:

```
GAMES DISK IC UF 0 18 "BOMBER" PRG 0 24
"CHESS" PRG 0 55 "ADDRESS FILE"
```

We've already printed the disk name and ID and now we are ready to read in all the filenames and file sizes. The size appears first (preceded by a zero and two spaces), then a quote, the filename, another quote, the type of file, and the size of the next file. We only want to print the file size and the name. So, we'll use the quotes to tell us when to turn our printing on or off. And we'll use that zero to tell us when we've found a file size number.

The Main Loop

Let's take it from the top. In line 290 we jump to a subroutine which prints the size number. Then line 300 is a loop which looks for the first quotation mark. If it finds a carriage return (#13), it jumps down to end the whole machine language program. That's because directory files end with a series of #13s. So, when we find a 13, we know we're finished.

Assuming we're not finished, we keep pulling in bytes until we find a quote. That gets us past the BNE at the end of line 300, and we fall down to line 310. This next loop is quite similar to the one in line 300 except it contains a JSR PRINT. Every byte coming in now will be printed on the screen and will allow us to see the filename. We exit this loop when we find another quote symbol (#34).

Now, in line 330, there's another loop which looks for a zero (signifying that a file size number is coming in). That forces us to BEQ and go to the ENDTEST which pulls in the two-byte number. The loop in line 330 also looks for a #42 which is the * symbol. Finding a * would mean that a bad file was on the disk—and we want to be alerted to that. Line 340 will print two ** symbols and then jump back into the loop on line 330 to continue looking for the zero.

Line 350 pulls off the two spaces after the zero, positioning us to get the file size number. We put these two bytes into a variable we've set aside called SIZE (see line 610). SIZE will hold these bytes until we need to print them. Then we start the whole thing over again by jumping back up to the start (line 360 jumps to line 290).

Shutting Things Down

We only get to line 370, the close-down routine, if we came upon a #13 up in line 300. That, you


recall, meant that we'd arrived at the end of the directory file. Anyway, to close down we print the letters FRE (the last thing printed on screen will have been the number of blocks left free on the disk). Then we CLOSE file #1.

We clear the channels, which means that normal I/O conditions are restored: Input comes from the keyboard, output goes to the screen. That last RTS sends us back into BASIC since we got to this ML program with a SYS. SYS acts just like a JSR except that it goes from BASIC to ML and then an unmatched RTS will send you back to BASIC.

How did I know enough about the format of directory files to be able to construct this ML program? Often the easiest thing is to first construct a BASIC program to see how things work. I set up a simple BASIC sketch:

```
10 OPEN 1,8,0,"$0"
20 GET #1, A$:PRINT A$;GOTO 20
```

and then just watched what came in on the screen, counted spaces, and figured that the quotes, the zeros, and the carriage returns (#13) would be my triggers. They would be the IF/THEN signals that something different was happening. They could be tested for in loops and force exits from those loops.

See program listings on page 194. 

Program Your Own EPROMS

► VIC 20 **\$99.50**
► C 64

PLUGS INTO USER PORT.
NOTHING ELSE NEEDED.
EASY TO USE. VERSATILE.

- Read or Program. One byte or 32K bytes!

OR Use like a disk drive. LOAD,
SAVE, GET, INPUT, PRINT, CMD,
OPEN, CLOSE—EPROM FILES!

Our software lets you use familiar BASIC commands to create, modify, scratch files on readily available EPROM chips. Adds a new dimension to your computing capability. Works with most ML Monitors too.

- Make Auto-Start Cartridges of your programs.
- The *promenade*™ C1 gives you 4 programming voltages, 2 EPROM supply voltages, 3 intelligent programming algorithms, 15 bit chip addressing, 3 LED's and NO switches. Your computer controls everything from software!
- Textool socket. Anti-static aluminum housing.
- EPROMS, cartridge PC boards, etc. at extra charge.
- Some EPROM types you can use with the *promenade*™

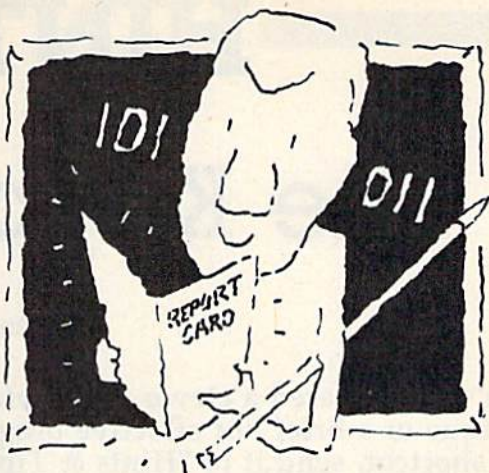
2758	2532	462732P	27128	5133	X2816A*
2516	2732	2564	27256	5143	52813*
2716	27C32	2764	68764	2815*	48016P*
27C16	2732A	27C64	68766	2816*	

► *Commodore Business Machines

*Denotes electrically erasable types

Call Toll Free: 800-421-7731
In California: 800-421-7748

 **JASON-RANHEIM**
580 Parrott St., San Jose, CA 95112



The Visible Computer. The machine language teacher that gets good grades.

Users and experts alike are giving The Visible Computer straight A's for making machine language understandable.

InCider magazine: "TVC is excellent".
Learning Computing: "Best Educational Software of 1983." *Peelings* magazine: "AA rating ... The explanations are truly excellent, being that rare combination: correct and intelligible." Basic Programmer, Rockford, Illinois: "Wow!".

With The Visible Computer's graphic 6502 simulator, thirty sample programs, and 160 page tutorial-style manual, you'll find that the only mystery about machine language is why no one ever taught it this way before.

The Visible Computer: 6502

Send me The Visible Computer: 6502 for Commodore 64 (requires disk drive). I've enclosed \$39.95 plus \$2.50 postage and handling.

Check or Money Order Visa Mastercard

Name _____

Address _____

City/State/Zip _____

Credit Card No. _____

Exp. _____



**Software
Masters™**

3330 Hillcroft, Suite BB
Houston, Texas 77057
(713) 266-5771

CG

The Keyboard Funnel

Anthony James Daly

If you've discovered a clever timesaving technique or a brief but effective programming shortcut, send it to "Hints & Tips," c/o COMPUTE!'s GAZETTE. If we use it, we'll pay you \$35. Due to the volume of items submitted, we regret that we cannot always reply individually to submissions.

You may not have thought about it before, but the keyboard on your computer is just another peripheral. The chip that controls the computer is not directly connected to the keyboard; it has to talk to the keyboard through an interface chip, much like it talks to a disk drive or printer.

Keystrokes don't enter the computer directly. They are funneled into the *keyboard buffer*, an area of memory which can be directly accessed by the chip which controls the computer.

Sixty times a second your VIC or 64 interrupts whatever it is doing for some housekeeping. The jiffy clock (which registers every sixtieth of a second) ticks once, the screen is refreshed, and the keyboard wiring is checked for a signal that a key was pressed. But before the character is printed on the screen, its ASCII value is put into the keyboard buffer at memory locations 631-640. At the same time, the value in location 198, which keeps track of how many characters are in the buffer, is increased by one, unless it has reached its maximum of ten. When you're typing, the letters aren't printed directly from the keyboard to the screen; they make a short stop in memory.

In immediate mode (when a program is not running), the characters are pulled out of the keyboard buffer immediately and put on the screen.

But when a program is running, the characters are saved up until the program either ends or tries to INPUT or GET. You can see how this works if you enter `FORJ=1TO5000:NEXT`, a simple delay loop. After pressing RETURN, hit a key twenty times. When the loop ends, you should see ten (not twenty) of the letters on the screen.

That's because the keyboard buffer comprises only ten bytes. Once it is full, nothing more is added until the buffer is accessed with an INPUT or GET.

Think of the keystrokes as raindrops falling through a funnel (the interface chip) into a tiny bucket (the keyboard buffer) which can hold only ten drops at a time. When the bucket is full, no more raindrops will fit until the bucket is emptied.

With a few POKES, we can control the keyboard buffer and its contents.

Emptying The Buffer

Manipulating the buffer at 631-640 and the byte at 198 (number of characters currently in the buffer) can solve some common programming problems.

For example, you're playing a game and it asks `PLAY AGAIN (Y/N)?` and you type Y. Nothing seems to happen for whatever reason; maybe the computer is setting up variables. So you press Y again. A second later you see `INSTRUCTIONS (Y/N)?` flash briefly on the screen, followed by the first of 20 pages of instructions. You didn't want the instructions, but you got them anyway.

The problem is that the second time you typed Y, it was stored in the keyboard buffer. When your computer got to the instructions prompt, it went to GET a character and found a Y right there.

A variation on this can happen in data entry (say, a checkbook balancing program). Perhaps you mean to enter a check for \$36 but you miss the top row of keys, hitting E and Y by mistake. You see `ERASE EVERYTHING` for a moment, followed by `ARE YOU SURE (Y/N)?` The Y in the buffer answers the question for you and three hours of work are destroyed.

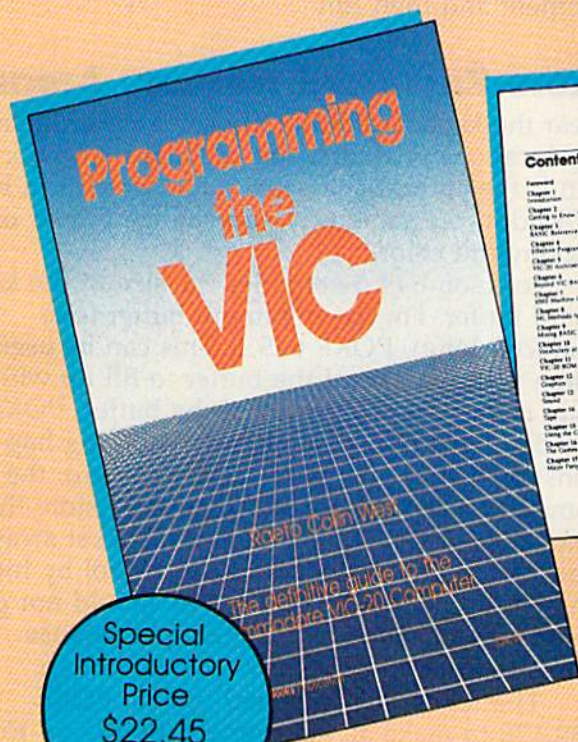
The solution is simple. Since location 198 holds the number of characters in the buffer, `POKE 198,0` tells the computer nothing is there at the moment. Use this POKE before INPUT or GET statements to eliminate extra characters in the buffer.

Vic-20 Owners

The ultimate reference book

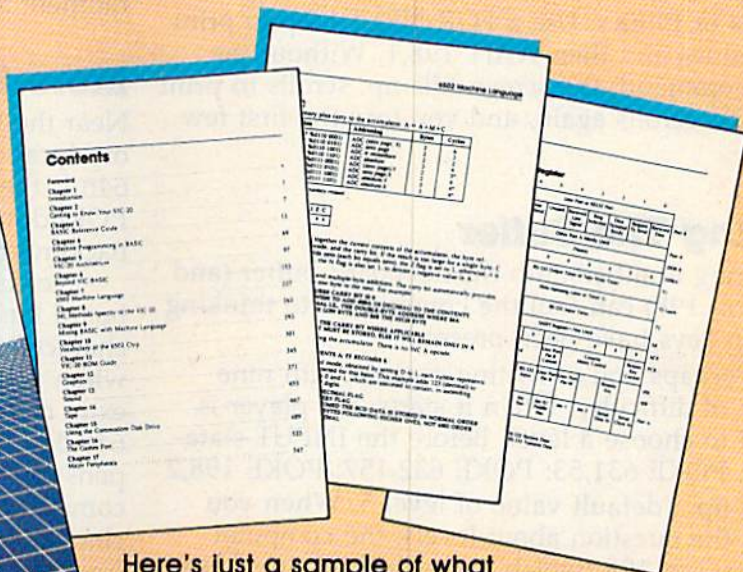
The complete encyclopedia for the Commodore VIC-20 is now available. COMPUTE! Books, one of the leading publishers of application-oriented consumer computer books, has released *Programming the VIC* by Raeto Collin West. And we offer this extraordinary volume to you at a very special introductory price of \$22.45 if ordered by December 15, 1984, a 10% savings off the regular price of \$24.95.

For \$22.45 you can own the *definitive* book on the VIC-20. There has never been a book published for the VIC-20 that gives you what this one does.



Special
Introductory
Price
\$22.45
(Save \$2.50)

Programming the VIC
Raeto Collin West
\$24.95
ISBN #0-942386-52-3
608 pgs.
paperbound



Here's just a sample of what *Programming the VIC* includes:

- Detailed descriptions of every BASIC command in the VIC's vocabulary
- Discussions and examples of BASIC and machine language programming techniques
- Comprehensive guides to VIC sound and graphics
- A thorough mapping of the VIC-20's ROM
- An annotated list of 6502 opcodes
- A practical guide to selecting and using printers, plotters, and modems

Programming the VIC's 17 chapters address virtually every programming situation that you, a VIC user, are likely to encounter. The book contains hundreds of examples and dozens of complete programs published in ready-to-type-in form.

Beginning to advanced programmers alike will find *Programming the VIC* to be an indispensable VIC resource. Whatever your programming level and whatever your VIC needs, this is a book that you'll refer to again and again.

Mail your prepaid coupon to: COMPUTE! Books, P.O. Box 5406, Greensboro, NC 27403 or call 1-800-334-0868 **\$22.45**

Yes! Send me _____ copies of *Programming the VIC* at \$24.95 per copy.
*Limited offer. Save 10% if you order by December 15, 1984.

All orders must be prepaid in U.S. funds. Add \$3.00 shipping & handling per book. N.C. Residents add 4.5% sales tax. Total payment enclosed. \$ _____

Payment enclosed (check or money order).
 Charge my Visa MasterCard American Express

Acct. No. _____ Exp. Date _____
Name _____
Address _____
City _____ State _____ Zip _____

Please allow 4-5 weeks for delivery. 7VICGN4

Press Any Key To Continue

Since location 198 holds the number of keys pressed, we can use it for a user-defined delay.

A title screen or page of instructions often includes a line like PRESS ANY KEY TO CONTINUE, since some people read faster than others. The usual way of checking for a key press is to use a GET statement. To save a little memory, use WAIT instead. To be safe, clear the keyboard buffer first. POKE 198,0: WAIT 198,1 is a substitute for 50 GET A\$:IF A\$ = "" THEN 50, uses less memory, and doesn't need a whole line of its own.

The same technique can be useful in immediate mode. For example, you might want to use all 25 lines (23 on a VIC) to print variable values or PEEKs. Use a FOR-NEXT loop to print the values and then WAIT 198,1. Without the wait command, the screen fills up, scrolls to print READY, scrolls again, and you lose the first few lines.

Filling The Buffer

POKEing numbers into the keyboard buffer (and location 198) can fool the computer into thinking certain keys have been pressed.

Perhaps you're writing a game with nine levels of difficulty. When it starts, the player is asked to choose a level. Before the INPUT statement, POKE 631,53: POKE 632,157: POKE 198,2 to set up a default value of level 5. When you reach the question about levels, the computer finds a 2 in 198 (which makes it think two keys have been pressed), gets a character "5" (ASCII value 53) and prints it. Next, it finds an ASCII 157 (cursor left). The user just presses RETURN for difficulty level 5 (because the 5 is already on the screen). Any other value can be entered by pressing the appropriate key.

The buffer holds up to ten characters, which provides a lot of flexibility for setting default values in programs which use INPUT (for obvious reasons, you can't do this with GET). Just remember to use ASCII values, starting at 631, and POKE the total number of characters into 198. You can even change the character color or turn reverse on.

The dynamic keyboard technique (more on this in an upcoming issue) uses a variation on this idea. You fill up the keyboard buffer with carriage returns (ASCII 13), print BASIC commands or program lines on the screen, position the cursor, and end the program. The computer sees END and goes into immediate mode. Because there are 13's in the buffer, the commands on the screen execute. You might, for example, add DATA statements by printing an

open line number, the word DATA, and some information you want to build into the program. Underneath the new DATA line, print RUN. Position the cursor, POKE 13's into 631 and 632, and a 2 into 198. When the program ends, the DATA statement is added to the program and the program runs.

You could also list-proof a game which uses joysticks but not the keyboard. At the beginning of the program, POKE the numbers 78, 69, 87, and 13 into locations 631-634. POKE a 4 into 198. If the game player presses the STOP key, the letters N, E, W appear and the program is gone. Or POKE the values for R, SHIFT-U (the abbreviation for RUN), and carriage return. Any time you press STOP, the program will stop for a moment and then run.

More Keyboard Memory Areas

Near the keyboard buffer are some other memory locations related to the keyboard. Location 646 is the current character color, which can be POKEd in the same way you change border or background color.

Location 649 determines the size of the keyboard buffer. For the minimum buffer (one character long), POKE 649,1. This can be useful when you don't want the buffer to fill up with extra characters. To get rid of the buffer, POKE 649,0 and try typing something. Nothing happens. By setting the buffer length to zero, the computer has nowhere to temporarily store the characters. It's as if we pulled the bucket away from the funnel. You can regain control by hitting RUN/STOP-RESTORE. You should not put a value higher than ten in this byte because some important vectors can be overwritten.

The repeat flag is stored in 650. POKE 650,128 to make all keys repeat. POKE a 0 to go back to normal (space bar and cursor keys repeat). A 64 in 650 disables all repeating.

Thus, if you're writing a rapid-fire action game, you might want to make all the keys repeat. You would put a 128 into 650 and leave the buffer size at 10. But for a game where movement has to be precise, you could lower the buffer size to 1 or 2 and eliminate all repeating keys.

In an educational program for children, you might want to get rid of repeating keys with a POKE 650,64. For a spreadsheet, you'd leave the default values, so the cursor keys would repeat and allow quick movement from cell to cell. For word processing, though, you might as well allow all keys to repeat. Controlling the behavior of the keyboard buffer and related memory locations can help you create programs which are both efficient and convenient to use. ☐

NEW

MY SOFTWARE **TALKS ON**
YOUR COMMODORE 64™
AND YOU **DON'T NEED**
A SYNTHESIZER!

NEW

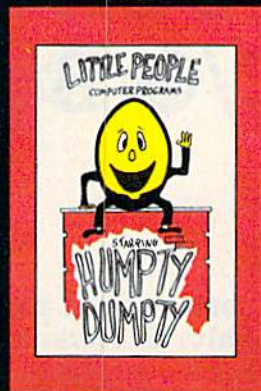


Little People Software

Developed by Parents and Educators

- ... Hearing
- ... Seeing
- ... Doing

In a way that makes **LEARNING**
more fun and more effective



Humpty Dumpty
Alphabet program
by Dave Paulsen
Put Humpty together
again and learn: the
Alphabet, the
Computer Keyboard,
how to spell your
Name ... and more.



Little Bo Peep
Number program by
Joe Sams and
Scott Barker
Bring Bo-Peep's
sheep home and
learn: to Count, to
spell your Name, the
Computer Keyboard
... and more.

L. P. Money I
by Aaron Grant

Teaches money values — one cent to one dollar — using a gum ball machine. Encourages money saving.

L. P. Money II
by Tom Wanne

Teaches money values — one dollar to one hundred dollars — using an ice cream machine. Encourages money saving.

L. P. Shapes
by Doug Knapp

Learn to recognize geometric shapes and how to spell their names.

L. P. Traffic Signs
by Tom Wanne

Teaches identification and meanings of traffic signs and signals. Increases safety awareness.

L. P.'s Farm
by Aaron Grant

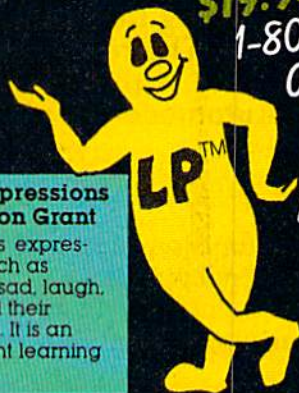
Teaches names and identification of farm animals.

L. P. Colors
by Aaron Grant

Teaches names and identification of colors and reinforces learning of colors and shapes.

L. P. Expressions
by Aaron Grant

Teaches expressions such as happy, sad, laugh, cry, and their spelling. It is an excellent learning tool.



\$19.95 EACH — ORDER NOW!
1-800-328-2050
OR IN WASHINGTON
1-800-221-2878.
**(YOU CAN PAY MORE
BUT YOU CAN'T GET
MORE!)**



Computer Profit Systems, Inc.
9661 Firdale Avenue
Edmonds, Washington 98020

Creators of the Money Making:
Data Deli™
Comp-u-tutor
Home Learning Systems

Mastercard and Visa

Save \$2.00 per program
Shipping Charge by
purchasing at your local
software store.

**DEALER INQUIRIES
INVITED**

S.A.M. licensed from Don't Ask, Inc.
*Commodore 64 is a trademark of Commodore Business Machines

GAZETTE

Telecommunications

Software, Part 2:

The C/G Bulletin Board System

Robert Sims

This month we continue our presentation of the color/graphics telecommunications package. "C/G Term," published last month, allows two people to use a modem to connect their computers directly over the phone lines, and to communicate using the full color and keyboard graphics capabilities of the VIC or 64.

The "Color/Graphics Bulletin Board System" (C/G BBS) makes it possible for many people to trade information and programs without being in direct one-to-one contact.

The BBS is written entirely in machine language (ML), but no knowledge of ML is required to use it. Because the listing is so long, we're publishing the first half of the code this month. The remainder will appear next month. A 64 with one or two disk drives, a 1650 Automodem, and a printer are required.

An electronic bulletin board functions in much the same way as its conventional namesake: Messages can be put up about most anything, whether it's free kittens, meeting announcements, or a lost sweater.

With "C/G BBS," anyone with a basic knowledge of the Commodore 64 can put up an electronic bulletin board almost as easily as hanging an ordinary bulletin board. Instead of a cork board and some wall space, you need a computer system, a modem, and a phone line. Other than that, it's similar to a bulletin board in any school or office hallway.

But there are some important differences in the ways these two kinds of message boards are used. You can read an electronic board without

leaving home. You can leave or receive private messages. And electronic boards can contain long documents or program listings that won't fit on a conventional bulletin board.

There are several kinds of electronic bulletin boards, with various capacities. Large information services like CompuServe, The Source, and Delphi contain bulletin boards that hold a thousand messages and allow many callers to use the board simultaneously. And they're on-line 24 hours a day.

At the other extreme are small boards which have a capacity of 50 messages or less, allow only one person to access the system at one time, and may be on-line only a few hours a day.

The C/G BBS is a small system, but it has some features not usually found on small bulletin boards. It is simple to operate, it automates as many of the technical aspects of telecommunications as possible, and callers are presented with menus or simple prompts rather than a long list of commands.

Also, the BBS may contain from 120 to 1000 public messages (depending on length) and as many private messages. Messages are stored in "endless" files. When the records are full, the program calculates how much room it needs for a new message and adjusts its tables accordingly. The oldest messages are automatically erased as new ones come in, so the board operator doesn't have to worry about running out of storage space.

Calling The BBS

To call a C/G BBS, you need a VIC or 64, a modem, and a copy of C/G Term (published last month). Because the C/G BBS and C/G Term communicate using unique codes, other terminal programs will not work with this bulletin board.

RAID OVER MOSCOW™

Strategy Arcade Game
By Bruce Carver

The Soviets launch a nuclear strike against major cities in the United States and Canada. Our only hope is our space station equipped with stealth bombers, which can fly undetected in Soviet airspace. As squadron leader, you must first knock out the Soviet Launch sites and then proceed into the city of Moscow. Armed with only the weapons you can carry, you command an assault on the Soviet Defense center and destroy it to stop the attack. Top Multiscreen action!



Top Multiscreen Action Included in Raid Over Moscow



• Joystick Controlled • Suggested Retail Price \$39.95
Disk: Commodore 64 (Available soon on Atari)

RAID OVER MOSCOW

"Play It Like There's No Tomorrow!"



BEACH-HEAD™

Arcade Game
By Bruce Carver

General Quarters! Battle Stations!
As chief commander of land and sea forces in the Pacific, your mission is to obtain a quick naval victory and invade enemy territory with your land forces. Beach-Head is a 100% machine language game and offers multiscreen action with high resolution, three dimensional graphics.



Top Multiscreen Action Included in Beach-Head



• Joystick Controlled • Suggested Retail Price \$34.95
• Disk: Commodore 64, Atari 48K

BEACH-HEAD™

"The War Game To End All War Games!"



Available for: Commodore 64 ★ Atari ●



Neutral Zone



Master Composer



925 East 900 South SLC., Utah 84105 (801) 532-1134



The Scrolls of Abaddon



Spell Now

Attach your modem and set it for originate. Turn on your computer and load and run C/G Term (published in last month's GAZETTE).

Then place the phone call to your local C/G BBS. When you hear the carrier signal (a high-pitched tone), unplug the cord from the telephone handset and plug it into the modem if you have a VICmodem. (Automodem users should move the T/D switch from T to D.)

Then press the space bar on your VIC or 64 and you'll see the welcome message from the BBS. You'll then be asked for an ID number. If this is your first time on the board, you won't yet have an ID number, so press RETURN to tell the BBS that you are a new user.

You'll see a brief message, then you'll be asked to supply your name, address, and phone number so the sysop (system operator) can set up your account. Although you might want to use a pseudonym while on the bulletin board, you must provide the sysop with your real name, address, and phone number. Once that information is entered, you'll receive the main menu containing nine options:

MAIN MENU

- 1) Read messages
 - 2) Leave a message
 - 3) Pick up EMAIL
 - 4) Send EMAIL
 - 5) Download library
 - 6) Upload area
 - 7) Chat with the sysop
 - 8) New password or handle
 - 9) Log off
- >

Messages are public; anyone can leave them for anyone else to read. Email ("Electronic Mail"), as its name implies, is a private message from one user to one other. You can only read EMAIL addressed to you.

As a new user, you can only read messages, chat with the sysop (system operator), or log off.

After the sysop has contacted you and given you an ID number and password, you'll have full access to the bulletin board.

Read A Message

To read the public messages, type a 1 when you see the prompt (>) at the end of the main menu. You will then be given the choice to read the full text of messages or to scan the headers—who sent the message, who it's addressed to, and the subject. When you type in your choice, you'll be told which messages the board contains, and asked for the number of the first message you want to read. As a new user, you probably want to begin with the first message, which is displayed after you enter a 1 and press RETURN.

At the end of each message, on the bottom

line of your screen you'll see the prompt:

RETURN r m (?=help)

To read the next message, press RETURN; to go to the read messages menu, press r; to get back to the main menu, press m. And if you forget what each response means, type a question mark.

You can read the entire message file by pressing RETURN after each message is displayed. To go back and read an earlier message, press r for the read messages menu and enter the message number you want.

Sending Messages

To leave a message on the board (after you've been signed up by the sysop), select option 2. Your screen will clear and you'll be prompted to name the person you're leaving the message for. Type in the person's handle (a name less than 25 characters) and RETURN. The program automatically inserts your name and ID number into the message, so everyone knows you sent it. Next, the subject prompt will appear. Respond with a line of less than 32 characters and RETURN.

The screen will clear again, and you're ready to type in the message. You can type freely, using the cursor keys or RETURN to move the cursor around. Use the color and reverse keys just as you do when your computer is in immediate mode with no program running. And your terminal program includes a routine that won't let your message scroll up the screen if you accidentally move the cursor onto the bottom line of the screen.

When you're finished composing your message, press f2. You'll see the prompt "one moment please..." on the bottom line of the screen, then the cursor will disappear, and the computer will seem to pause while it collects the message from the screen, translates it into a form that can be transmitted, and sends it to the bulletin board where the message is stored in the message file.

The time required to transmit and store a message depends on the length of the message. A message of 1000 characters with several colors can take as long as 30-40 seconds.

When this automatic process is complete, you'll see this prompt on the bottom line of your screen:

Message # XXX has been sent

Then the screen will clear and the main menu will be displayed.

Electronic Mail

The procedure for reading and sending private messages is essentially the same.

GREAT NEWS FOR OWNERS OF COMMODORE, APPLE, & ATARI COMPUTERS!

Most printers don't work with Commodore or Atari. And to get one that does, costs too much. That's why the engineers at Blue Chip designed a new personal printer called the M120/10. If you own a computer read on:

Of the ten high speed dot matrix printers most often used with Commodore, Apple, and Atari, none is less expensive than the Blue Chip M120/10. Or more powerful.

Fully equipped, it's about \$50 less expensive than a comparable, yet much slower Commodore printer. And in the vicinity of \$300 less than an Epson* set-up to work with a Commodore.

Despite its low price, the Blue Chip M120/10 is not a stripped down, bargain basement printer.

In fact, when you judge it by the same stringent standards computer professionals use—by weighing total

performance against cost—it's difficult to find a printer that compares to the Blue Chip M120/10.

Top speed with a Blue Chip M120/10 is 120 characters per second. To beat that in any other make of printer, you have to spend about \$400 more.

Special print modes on an M120/10 include graphics; condensed, bold-faced and expanded characters; as well as superscripts and subscripts, and near letter quality characters.

And to beat that in any other make of printer you have to spend nearly \$300 more.

And since it also has the IBM-PC*, Apple Macintosh* and IIC*, Serial, and Centronics interfaces**, you can use the Blue Chip M120/10 with just about any computer you may eventually own.

The Blue Chip Personal Printer costs a lot less than anything similar... without compromise in quality. Highly powerful and relentlessly practical.

See one today. Blue Chip printers are available at Best Products, LaBelle's, Jafco, Dolgin's, Miller Sales, Rogers, Great Western catalog showrooms, and other fine stores. Or call (800) 556-1234 Ext. 540. In California, call (800) 441-2345, Ext. 540, for more information and name of your closest Blue Chip dealer.

BLUE CHIP

ELECTRONICS

2 West Alameda Drive/Tempe, Arizona 85282/(602) 991-9833

*Commodore is a registered trademark of Commodore Business Machines Corp.

Epson is a registered trademark of Epson America, Inc.

IBM is a registered trademark of International Business Machines Corp.

Apple is a registered trademark of Apple Computer Inc.

**Replacement interfaces sold separately.



If you choose option 3, the BBS will search its electronic mail (email) file tables for messages addressed to your user ID number. If the files contain messages for you, the BBS will send the first email message, with a prompt in the bottom line of the screen asking whether you want to erase the message. After you read the email and respond by typing y or n (yes or no), the BBS will display your next email message, and so on, until the last message is sent. The BBS then clears the screen and returns you to the main menu.

Each time you pick up your mail, the BBS sends all your messages, whether you have read them before or not. So, to avoid cluttering your mailbox with old letters, it's a good idea to erase each one after you read it.

To send email to another bulletin board member, you follow the same steps as in sending regular messages. But when the "To" prompt appears, you must enter a user ID number instead of a name. The program ignores any non-numeric input.

The Download Library

If you select the download option, you will be given a menu of the available files, with a brief description of each. To download a file, simply type the number of your selection at the > prompt. After a pause, you will be asked to enter a filename so your terminal program can store the file on disk. (Be sure the filename is not a duplicate of some file already on the disk.)

After you supply the filename, the download procedure is automatic. You will see a series of numbers scrolling up the screen as the file comes in. When the transfer is complete, you'll be returned to the main menu. (For a more detailed discussion of the transfer procedure, see last month's article.) The BBS transfers files at an approximate rate of 1K bytes in two minutes. So a file containing about 5000 bytes (20 disk blocks) will transfer in 10 minutes.

Any file you download from the C/G BBS is ready to use when it's stored on disk. Some BBS software sends files which must be converted before they are usable, but your terminal program performs this conversion before it stores the file. If you're anxious to try out the program or text file you just downloaded, select main menu option 9. You'll see the 9 displayed after the > prompt, and the cursor will move to the next line. You are now disconnected from the BBS. Disconnect the modem from the phone line, clear the terminal program from the computer, and you're ready to load and run the downloaded program.

Uploading To The BBS

The C/G BBS allows callers to upload files as well. So long as there is room on the email disk, a caller can submit a file for inclusion in the download library. The upload procedure is similar to downloading, except that you supply the filename of an existing file on your disk. The terminal program collects the file from your disk and transmits it to the BBS.

As part of regular BBS maintenance, the sysop will look at the submitted file and decide whether to add it to the download menu. To avoid duplicate filenames, the BBS stores the transmitted file using a name in the sequence UP01, UP02, UP03, and so on. When the file is uploaded, the BBS sends a record of the transfer to the printer, so the sysop will know who sent the file and what the caller wants to name the file.

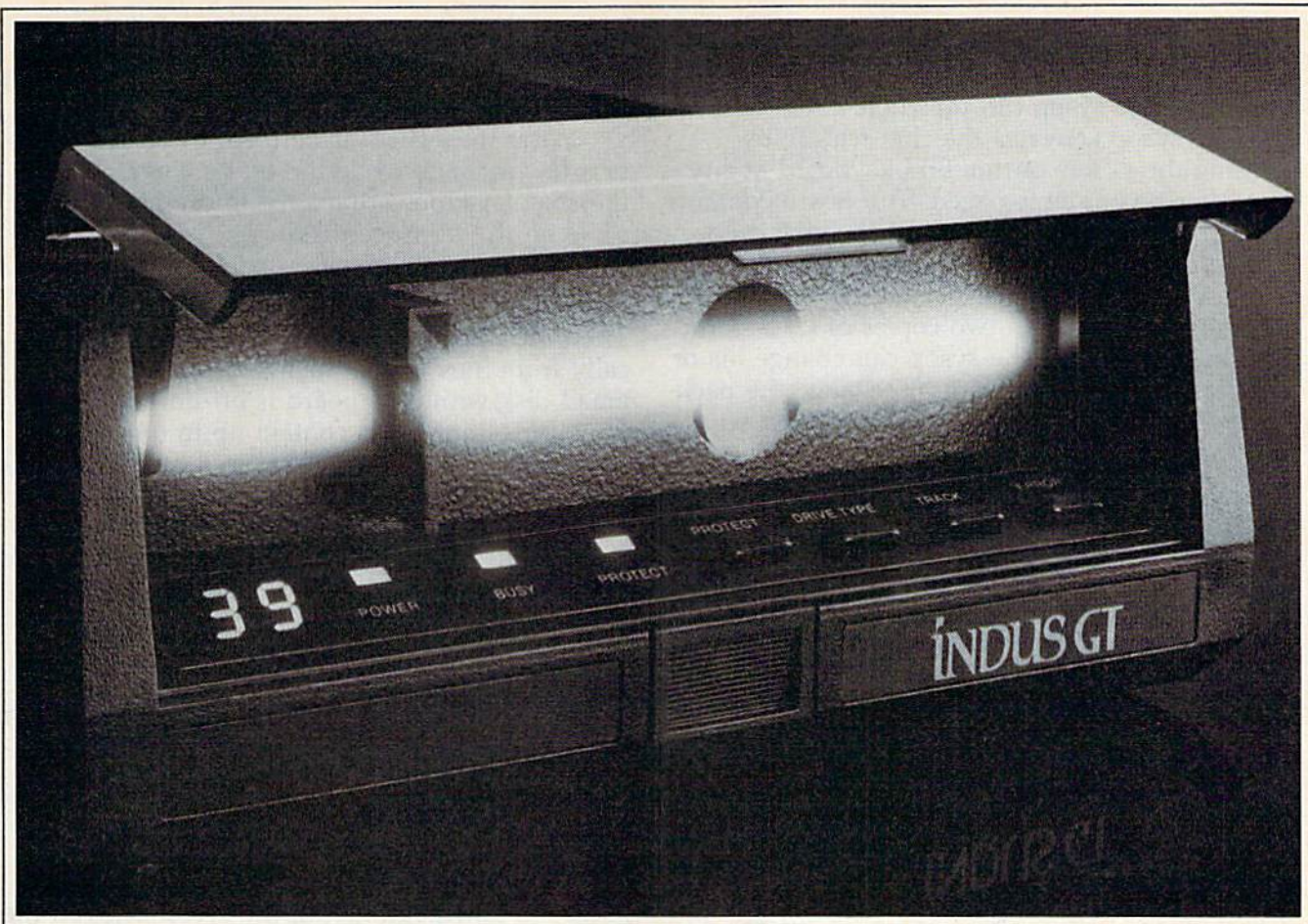
All upload operations should involve two files: the file itself and a documentation file which explains how to use the main file. A documentation file can be as simple as a BASIC listing that consists of REM statements, or it can be a document produced with *SpeedScript* or another word processor.

To help the sysop and other callers identify your uploaded files, you should use file extensions which describe the type of file. A BASIC program might have the extension .BAS, a documentation file of REMark statements might have an extension .REM or .DOC, a *SpeedScript* file can bear the extension .SPD, and so on. For example, a machine language sort program could be uploaded as SORT.ML and its accompanying documentation file might be SORT.SPD or SORT.REM.

The next option allows you to change your name or password. When the sysop opens your account, your first name will be put in the file. If you prefer to use a pseudonym or nickname, use this option. Also use it to change your password regularly. If another caller discovers your password, he or she can go on-line and leave messages in your name. If the BBS has a fee, you'll be paying for their time.

Talking To The Operator

If you find some of the BBS procedures confusing, or you just want to say hello, you can leave messages and email for the sysop (for email, use ID # 1000). For an immediate conversation, you can use option 7, chat with the sysop. When you select this chat feature, the BBS tells the sysop you want to talk. After you page the sysop, continue using the board. If the sysop is available, he or she will make contact at a point when you are receiving the main menu. So don't page the



What you get if you cross a Commodore 64 with a Ferrari.

You get the incredible Indus GT™ disk drive. You get brains. You get beauty. But, that's not all you get. You get a disk drive that can handle 100% of Commodore's software. 400% faster.

You get the disk drive with the best service record around. With a one year warranty on parts and labor to prove it.

And, you get the only disk drive that comes with free software. Word processing. Spreadsheet. Database manager. Plus, a carrying case that doubles as an 80 disk storage file.

Most of all, you get luxury. From the sleek lines of its sound-proofed chassis to the responsive AccuTouch™ controls at the Indus CommandPost™. From the

LED display that keeps you in control of your Commodore to the air-piston operated dust cover that protects your disks and drive.

So, you know what you really get if you cross a Commodore 64 with a Ferrari? You get the best.



INDUS™

sysop and then proceed to download a file that takes 20 minutes. Return to the main menu frequently so the sysop can make the connection.

The sysop activates the chat feature by pressing the f1 key on the BBS keyboard at any time after he or she is paged. The board contains an interrupt routine that goes to the chat mode instead of the main menu.

In chat mode, the caller and the sysop type normally, just as when two copies of C/G Term are communicating. The sysop can change his or her border color by pressing f3, change the background color with f4, and clear the screen with f6. When the two of you are through talking, the sysop returns the caller to the main menu by pressing f2.

Maintenance

Just as with a regular cork bulletin board, someone must update an electronic board, removing outdated messages and generally maintaining order.

The sysop can perform maintenance on the C/G BBS in one of two ways: Use the maintenance sequence, which occurs when the board is first run, or force the board to maintenance mode by pressing f7 while the board is on-line. This causes the program to go to the maintenance routines when the current caller logs off. The maintenance call can be canceled by pressing f8.

Normally, when you log off, the BBS updates its tables to include new messages or changes in your name or password, and adds your time on-line to the cumulative time stored in your user file. (Cumulative time is stored as total minutes, in binary coded decimal format.) In addition, your user ID number and time on-line are sent to the printer so the sysop will have a running record of traffic on the BBS. This printed record helps the sysop keep up with who is using the board and when the upload area is getting full, so he or she can perform timely maintenance.

Maintenance includes defining the system, updating the download library and processing uploaded files, typing in new user information, and updating the message files.

At the beginning of maintenance, the sysop sees this menu:

Does your system have:

- 1) one drive, # 0, device 8
- 2) two drives, # 0, devices 8 and 9
- 3) two drives, # 0 and 1, device 8

If the BBS is being run with one 1541 drive, option 1 is selected. With one drive, only the public message files are in use. The board does not have email, download, or upload capability.

With two drives, the board is fully opera-

tional. The system operates with the message disk in drive 0 (or device 8) and the email disk in drive 1 (or device 9).

After the system is defined, there is a pause of a few seconds while the tables containing message locations are loaded into memory from a file on the message disk.

An Automatic Menu Builder

Then the download menu is created automatically from files which the sysop stores on the email disk while the board is off-line. The download library can contain up to nine files. Each filename to be included in the download library must begin with the letter D. The BBS prints each filename in turn and asks the sysop to type in a description of up to 50 characters. The menu is then compiled and stored in memory.

If the email disk contains no filenames beginning with D, the program will display an empty menu, and a caller must type a 0 to return to the main menu. The email storage file takes up 405 blocks, leaving 259 available for the download library and uploaded files.

Changing User Information

After the download menu, the sysop is given the option of updating the user information files and message files.

If the user files are chosen, the sysop will see a menu which allows him or her to change the user's name, password, cumulative time on-line, or status. The first three options are used mainly in setting up a new account. After the initial entry, the user can maintain his or her own name and password changes, and cumulative time is computed automatically.

However, option four, status, is accessible only to the sysop. Through this option, the sysop can enter a code that automatically refuses to let the user log onto the board. Such a feature is a regrettable necessity.

Updating Messages

By choosing to update messages, the sysop causes the board to talk to itself. The program gets its input from the keyboard instead of from the modem, so the sysop can read messages, erase messages, and leave messages for other users.

The sysop reads messages just as other callers do, except that he or she has the added ability to erase regular messages by typing a k (kill message) at the RETURN r m (?=help) prompt. This feature is accessible only from the BBS keyboard; the erase routine ignores modem input while the BBS is on-line.

Introducing The Gold Disk* Subscription Series

SOPHISTICATED SOFTWARE FOR LESS THAN \$10

The Gold Disk is a brand new way to get even more out of your Commodore 64®, because now, you can get all the programs you want and need at unbelievably low cost.

Every month, subscribers to the Gold Disk will receive a disk that contains a feature program that in itself, is worth the price of the subscription. In addition there are tutorials, games, a programming puzzle, music, sound effects, programmers' corner on each disk. A wealth of quality software for less than \$10.

Our Premier Issue — December includes:

- A complete data base system
- Home finance program and tutorial
- Learning Basic — Part I — tutorial
- 2 Arcade Action games with full 3D graphics
- Music of the month
- Graphics of the month
- Puzzle of the month
- Sound effects with source code
- Programmer's corner and more

In the months ahead, the feature programs include an Assembler, Word Processor, Information Management System, Micro Forth, Debugger, etc. Plus a great many other educational and entertaining programs.

To begin your subscription simply fill in the coupon below. The Gold Disk — all the programs you need at subscription prices.

Subscribe Now. This is a special introductory offer and prices are in effect until December 31/84.

The
GOLD
DISK

THE GOLD DISK SUBSCRIPTION SOFTWARE

2179 Dunwin Drive, #6, Mississauga, Ontario, Canada L5L 1X3

YES, please send the Gold Disk for 6 months @ \$54.95 (U.S. funds)
 12 months @ \$99.95 (U.S. funds)

Add \$1.00 per issue for mailing and handling. Orders out of North America add \$3.00 per issue. Newsstand price per issue is \$11.95 U.S. Payment must accompany all orders. Allow 4 to 6 weeks for subscription start.

Name _____ Address _____

City _____ State/Prov. _____ Code _____

Check or money order enclosed Visa Mastercharge American Express

Acct # _____ Exp. Date _____ Signature _____

*Trademark pending

©Commodore 64 is a registered trademark of Commodore Business Machines

All prices quoted are in U.S. funds. Canadian orders please allow for exchange. Ontario residents add 7% sales tax.

To leave a message or email, the sysop must use C/G Term to create the message. Load and run C/G Term and press CTRL-C then f8 to enter message mode and create a message. The BBS message disk is then inserted into the drive, and the message is saved to disk by pressing f5.

Then, when the sysop is performing system maintenance and selects the send message option, the program asks for the filename of the message. After the name is entered, the program automatically adds the message to the system files.

To exit from the message maintenance mode, the sysop selects 9) Log off, and the program returns to the regular maintenance sequence.

When maintenance is complete, the sysop responds with an n to the prompt:

Update system files (y or n)

and the BBS is ready to take the next call.

Creating The BBS

The complete BBS will consist of three disks containing seven files. First, the bulletin board program and the auxiliary programs (see below) must be typed in and stored on a disk. Then a message disk is created, containing the message file, the user information file, and a file which holds the tables necessary to locate and display each message. The third disk will contain the email messages, and the download and upload libraries.

To create the message file, load the following program (CREATEMSG) and insert the formatted message disk in device 8. Then run the program, which creates a relative file of 401 records, each containing 254 bytes:

```
10 REM CREATE RELATIVE MESSAGE FILE
20 OPEN15,8,15:OPEN1,8,2,"MSGFILE1,L,"+CHR
R$(254)
30 PRINT#15,"P"+CHR$(98)+CHR$(145)+CHR$(1
)+CHR$(1)
40 PRINT#1,"@END"
50 CLOSE1:CLOSE15
60 END
```

Remove the message disk and insert the formatted email disk. Then make the following change in the program:

In line 20, for "MSGFILE1,L," substitute "EMAIL,L,"

Then run the program, which now creates the email relative file. Next, remove the email disk and insert the message disk again. Make these changes to the program:

```
10 REM CREATE RELATIVE USER STATUS FILE
20 OPEN15,8,15:OPEN1,8,2,"USTAT,L,"+CHR$(
86)
```

```
30 PRINT#15,"P"+CHR$(98)+CHR$(244)+CHR$(1
)+CHR$(1)
```

Now run the modified program. This will create the user information file, which consists of 500 relative records of 86 bytes each. (One record holds two user files.)

Finally, type NEW, then load the short machine language program (Program 1, "Tables Setup"):

```
LOAD "TABLES.OBJ",8
```

Insert the message disk and run this program to create and store to disk a file containing the initial message file pointers and other default settings which the BBS will need for its first run.

These files need be created only once, before the board is run for the first time. After that, the BBS program handles the file contents automatically.

After the files are created on the message and email disks, you should select the files you want to include in the download library and store them onto the email disk.

Going On-Line

When you are ready for the BBS debut, connect the Automodem to the 64 and the phone line, and set the switches for full duplex, answer, and data. Then load the bulletin board program (Program 2):

```
LOAD "BBS",8
```

Insert the message disks and email disks, and run the program. After you go through the initial maintenance sequence, the BBS will wait for the first caller. You can now call yourself a sysop.

But being a sysop involves more than running the program and walking away.

Operating a bulletin board requires a large commitment of time and resources. Also, there's a certain amount of paperwork, and several decisions to be made before you go on-line.

First, the phone line and computer system will be unavailable for other use while the BBS is running. If you have only one phone and one computer, you'll have to operate the board part-time. You may want to consider establishing regular operating hours, so people will know when to call. And be sure to notify your friends that you will be unavailable to talk on the phone during those hours.

If you plan to have a separate phone line and computer just for your board, you can run the BBS 24 hours a day. But your 64 and disk drive can overheat under such heavy use, so round-the-clock operation is not recommended. Since the disk space available for file transfers is limited, you'll need to take the board off-line at least once a day, anyway.

Sensational Prices!

... On Our Most Popular Items!

DUST COVER and "EVERYTHING BOOK" INTRODUCTORY SPECIAL

Get to know us by ordering this great dust cover for your VIC-20 or Commodore 64 and our catalog, "The Everything Book for the Commodore C-64 and VIC-20 Home Computers," for \$2.95 (no extra shipping or handling charges). Cover is antistatic, translucent, 8 gauge vinyl sewn to our exacting standards with reinforced seams. Discover the savings and easy shopping available from Tenex Computer Express!



\$2.95

31627 Dust Cover and Catalog

MSD SUPER DISK DRIVE Maximum speed! Commodore compatible!

You get more than Commodore compatibility with a MSD Super Drive. This "smart" drive with 4K buffer memory and space saving design is FAST... formats disks in 18 seconds! Will read disks for 1541 drives. Comes with serial cable for \$339 direct-connect to C-64 or VIC-20.

31365 ONLY

\$339

If sorcery fascinates you, try

WIZARD

The colors, graphics, sounds and action in this game are outstanding... even our best game players were impressed when WIZARD arrived at our offices! Jump from ropes to ladders, dodge plummeting boulders and duck under deadly arrows in your quest for gold and jewels. Find the key, cast spells, and enter the next level. 40 screens in all! Includes a construction set if you'd like to create your own levels. Watch for rave reviews! From Progressive Peripherals and Software. A sure winner!

31435

\$29.95

FREE CATALOG

Enjoy "The Everything Book" for the C-64 and VIC-20 at NO CHARGE! Filled with over 500 software descriptions, peripherals and accessories, and how-to information on expanding your system. Includes discounts and easy order information! Request part no. 25997. Write to your friends at Tenex Computer Express at the address below!

Our best selling dot matrix printer...

GEMINI 10X



\$269

SALE!

This famous printer from Star Micronics has a nine wire print head and bidirectional printing at 120 characters per second. Prints super high resolution bit image graphics. Comes with both tractor and friction feed. Requires one of the parallel interfaces listed below.

CARDPRINT B PRINTER INTERFACE

Quality standard parallel printer interface for VIC-20 and C-64. Includes all cables. From Cardco. Lifetime guarantee.

28603 ONLY \$44.95

CARDPRINT +G INTERFACE WITH GRAPHICS

Top of the line from Cardco. Parallel printer interface with full graphics capability for VIC-20 and C-64. Lifetime guarantee.

20623 ONLY \$69.95

COMPUTER PAPER

Continuous 9 1/2 x 11" sheets of top quality 20# bond clear

white paper. 540 sheets per package

29535 ONLY \$7.95

Keep A Copy! Similar to above, but each page has two sheets for a carbonless copy. 350 pairs of sheets per package.

29549 ONLY \$12.95

OTHER GREAT PRINTER BUYS!

19179 Epson RX-80 ONLY \$299

23564 BMC BX-80 ONLY \$259

Friction & tractor; carbon ribbon!

21612 Gemini 15X; wide platen! ONLY \$449

WESTRIDGE 64/20 MODEM

Check out these features - auto-answer, auto-dial and re-dial! This 300 baud direct-connect modem comes with terminal emulator software on disk. (Auto features not available on VIC-20).



31613

\$79.95

ONLY

NEW: GATE CONTROL JOYSTICK FROM WICO



Famous WICO quality is now available with Gatelock Control for 8-way or 4-way action (great for the precise action required by maze games). Also features 3-way handle. Choose the bathandle, redball or pistol grip control for your favorite action. You can't get more options on a joystick!

31173

\$24.95

ONLY

From Your Friends At

TENEX
Computer
Express

We gladly accept
mail orders!

P.O. Box 6578
South Bend, IN 46660

Questions? Call
219/259-7051

Ad
G1B

SHIPPING CHARGES

ORDER AMOUNT	CHARGE
less than \$20.00	\$2.75
\$20.00-\$39.99	3.75
\$40.00-\$74.99	4.75
\$75.00-\$149.99	5.75
\$150.00-\$299.99	6.75
\$300 & up	7.75



NO EXTRA FEE FOR SHIPPING

ORDER TOLL FREE
1-800-348-2778

If you run the BBS for several hours before you turn off the computer, then you should provide ventilation, especially for the disk drive. I've found that filter fans work well for this purpose. A filter fan is a small fan which draws air in its bottom, through a filter, and pushes the air out the top. The filter traps dust, smoke, and other harmful airborne debris. There are several desktop models available for \$20-\$50.

Although the BBS can run unattended, you should monitor the system regularly. Callers will want to chat, the upload area will fill up, and you need to check the printout for new users.

A new user's name, address, and phone number are printed out so you can verify the information and add the caller's new ID number and password to the user information file.

Each regular caller generates at least two lines on the printer. The last three digits of the ID number are printed when the caller logs on. On log-off, the ID number is printed again, with the number of minutes the caller was on-line. If a file is uploaded, the ID number is printed, followed by the filename the caller gave the file and the name under which it's stored on the email disk (UP01, UP02, and so on).

To keep your upload and download functions running smoothly, you should process uploaded files every day. While the BBS is waiting for a call, move the T/D switch to T for telephone. Remove the system disks and press RUN/STOP-RESTORE. Insert the email disk in device 8 or drive 0. Then look on the day's printout for the upload filenames UP01 and so on.

Check the filename the caller gave the file to see which are document files. Then load each document file and read it to see what the main file contains. If you decide to include the file in the download library, you must rename it (see the manual that came with your drive for details on renaming files). Your new filename should begin with the letter D.

Remember that you can only have nine files in the download library, so you will have to scratch files to make room for new ones.

Since you can have up to 999 bulletin board members, you may want to set up a record-keeping system to keep track of who's got what ID number, which files they upload, and cumulative time on-line.

If you decide to run a free board, then this basic paperwork will be sufficient.

Bulletin boards traditionally are free and open to all, but several factors are changing that situation.

As more people become active in telecommunications, boards are more crowded. Some sysops are setting time limits for each caller.

Also, there have been cases recently in which the police have confiscated sysops' computers when illegal material such as stolen credit card numbers and pirated software have been found on the boards. Consequently, many sysops are being more selective about who they let on their boards.

And finally, many sysops can't afford to absorb the cost of an extra phone line and extra computer system to operate a 24-hour board. These sysops charge a small fee to cover those costs.

Each of these factors means more work for the sysop. You should check the messages regularly and cancel any that contain illegal material. The C/G BBS doesn't allow anonymous messages, so you can identify the caller who left the unacceptable message and notify them by email why their message was canceled.

If you charge a fee, you'll need a way to keep track of billing and income (be sure to keep complete records for tax purposes).

Typing In The Machine Language

First type in, save, and run MLX, found elsewhere in this issue. When prompted for the starting address, respond with 2049. The ending address is 17828. Be sure to save this program to which you will append Part 2 next month. C/G BBS is over 14K, so, for the sake of magazine space, we're publishing the first half of the code this month and the second half next month. Instructions on resuming with Part 2 will appear next month.

If you'd rather not type in the program, send \$3, a stamped, self-addressed mailer, and a blank disk, and I'll send you the entire ready-to-run BBS object code, the auxiliary programs, and the bulletin board source code (in PAL/LADS format).

*Robert Sims
100 Lee Street
Jamestown, NC 27282*

See program listings on page 177. ☺

COMPUTE!'s Gazette
Toll Free Subscription Order Line
800-334-0868
In NC 919-275-9809

SUPER PRINTER PACKAGES
 Gemini 10X and Cardco + G 333
 Prowriter and Cardco + G 414
 No additional shipping charges on Printer Packages in Continental USA

PRINTERS
 Alphacom 40C/Int. 99.95
 Alphacom 80C/Int. 189.95
 Epson Call
 Silver Reed Call
 Prowriter 8510 Call
 Legend 239
 Riteman 289
 Toshiba 1351 Call
 Toshiba 1340 Call

COMMODORE 64



THE POWER BEHIND THE PRINTED WORD.

Gemini 10X .259 Delta 15X .579
 Gemini 15X .389 Radix 10X .579
 Delta 10X .429 Radix 15X .699
 Powertype .339

CBM 64 Call
 SX-64 Call
 1541 Disk Drive Call
 1526 Printer 279
 1530 Datasette 66
 1702 Monitor Call
 1650 AD/AA Modem 89
 RS 232 Interface Call

**Call for Special Package
 64 System Price**

MODEMS
 Hayes Smart Modem 300 Call
 Mark VIII/Auto Ans/ Auto Dial Call
 Mark XII/1200 Baud Call
 Prometheus Call
 Westridge AA/AD Call

ANIMATION STATION TOUCH TABLET ... 59.95

Bring the trivia craze home with **P.Q. The Party Quiz Game** for the CBM 64-D. Call

C O M M O D O R E 6 4 S O F T W A R E

ACCESS
 Neutral Zone-D/T 23.95
 Sprintmaster-D/T 23.95
 Beachhead-D/T 23.95
 Master Composer-D 27.95
 Raid Over Moscow-D/T 27.95
 Scrolls Of Abaddon-D/T 23.95

ACCESSORIES
 WICO Joystick Call
 Flip 'n' File-D 20.95
 Flip 'n' File Cart 20.95
 Joysensor 24.95
 WICO Trakball 37.95
 KRAFT Joystick 15.95
 EIS CompuServe Kit 64.95
 VIDTEX 29.95
 Big Foot 16K Buffer Call
 Big Foot 32K Buffer Call
 Big Foot 64K Buffer Call
 Gemini 10X 8K Upgrade Call
 Monitors Call
 CompuServe Starter 27.95
 Elephant SS/SD 17.95
 Verbatim SS/DD 20.00
 Elephant SS/DD 20.00
 Ultra Magnetics SS/DD 18.00
 Alien Voice Box II-D 99.95

ACTIVISION
 Hero-D 24.95
 Pitfall II-D 24.95
 River Raid-D 24.95
 Decathlon-D 24.95
 Star League
 Baseball-D/T 23.95
 On-Field Tennis-D/T 23.95

AVALON HILL
 Call for Items and Prices

BATTERIES INCLUDED
 Consultant-D 69.95
 Paperclip w/Spellpak-D 84.95
 Super Busscard II Call
 Home Inventory-D 23.95
 Recipe-D 23.95
 Audio/Video Cat-D 23.95
 Mail List-D 23.95
 Stamps-D 23.95
 B.I. 80 Card Call
 Home Pak-D 37.95

BRODERBUND
 AE-D 23.95
 Bank Street Writer-D 49.95
 Chopflifer-D 23.95
 Drol-D 23.95
 Loderunner-D 23.95
 Operation Whirlwind-D 27.95
 Mask of the Sun-D 27.95
 Dr. Creep-D 20.95
 Gumball-D 20.95
 Bungeling Bay-D 20.95
 Spelunker-D 23.95
 Stealth-D 23.95
 Whistler's Brother-D 23.95

CARDCO
 Cardprint/B 47.95
 Cardco + G 64.95
 Cardboard/5 59.95
 Cardkey 39.95
 Cassette Recorder 37.95
 Printer Utility-D/T 19.95
 Write Now-Cart 34.95
 Mail Now-D 29.95
 File Now-D 27.95
 Graph Now-D 27.95
 Spell Now-D 27.95
 LO-1 Printer Call
 LO-2 Printer Call
 LO-3 Printer Call

CBS SOFTWARE
 Call for Items and Prices

COMMODORE
 Assembler-D 39.95
 Easy Finance I,II,III,IV-D 19.95
 Easy Calc-D 64.95
 Easy Mail-D 19.95
 Easy Script-D 44.95
 Easy Spell-D 19.95
 Logo-D 57.95
 The Manager-D 39.95
 General Ledger-D 39.95
 Accts. Rec.-D 39.95
 Accts. Pay-D 39.95
 Magic Desk-D 42.95
 Int. Soccer-Cart 22.95
 Magic Voice 54.95

DYNATECH
 Adventure Writer-D 41.95
 Codewriter-D 69.95
 Dialog-D 41.95
 Elf System-D 41.95
 Home File Writer-D 41.95
 Reportwriter-D 41.95
 Menuwriter-D 34.95
 Speedwriter-D 49.95

ELECTRONIC ARTS
 Archon-D 29.95
 Pinball Construction-D 29.95
 M.U.L.E.-D 29.95
 Murder/Zinderneuf-D 29.95
 One On One-D 29.95
 Archon II-D 29.95
 Financial Cookbook-D 37.95
 Music Construction-D 29.95
 7 Cities Of Gold-D 29.95
 Standing Stones-D 29.95

EPYX
 Dragons/Pern-D/T 27.95
 Mission Impossible-D 23.95
 Oil Barons-D 37.95

EPYX (cont'd)
 Pitstop II-Cart 27.95
 Puzzlemania Call
 Robots Of Dawn-D 27.95
 Summer Games-D 27.95
 Breakdance-D 27.95
 Barbie-D 27.95
 G.I. Joe-D 27.95
 Hot Wheels-D 27.95
 Impossible Mission-D 27.95
 World's Greatest Baseball-D 27.95

FIRST STAR
 Astrochase-D/T 20.95
 Bristles-D/T 20.95
 Flip-Flop-D/T 20.95
 Spy Vs. Spy-D 20.95

HANDIC
 64 Forth-Cart 29.95
 64 Graf-Cart 23.95
 Stat 64-Cart 23.95
 Calc Result Easy-Cart 34.95
 Calc Result Adv-Cart 69.95
 The Diary-Cart 23.95
 The Tool-Cart 29.95
 Bridge Cart 29.95

HESWARE
 Hesware Call

INSTA (CIMMARON)
 Insta-Writer-Cart 39.95
 Insta-Mail-D 24.95
 Insta-File-D 49.95
 Management Combo 64.95
 Insta-Calc-Cart/D 31.95
 Insta-Graph-D 24.95
 Insta-Vestor-D 31.95
 Insta-Speed-D 99.95
 Insta-Music-Cart/D 79.95
 Invest Combo 74.95

INFOCOM
 Deadline-D 29.95
 Enchanter-D 23.95
 Infidel-D 34.95
 Planetfall-D 24.95
 Sorcerer-D 34.95
 Starcross-D 29.95
 Suspended-D 29.95
 Witness-D 34.95
 Zork I, II or III-D 29.95
 Sea Stalker-D 29.95
 Cuthroats-D 29.95

KOALA
 Gibson Light Pen 69.95
 Koala Touch Tablet-D 69.95
 Koala Touch Tablet-C 74.95
 Muppet Learning Keys-D 54.95
 Doodle-D 27.95

MICROFUN
 Death in the Caribbean-D 27.95
 Dino Eggs-D 27.95
 The Heist-D 23.95
 Boulder Dash-D 23.95
 Short Circuit-D 23.95

MICROPROSE
 Floyd/Jungle-D 23.95
 Helicat Ace-D/T 23.95
 NATO Commander-D 23.95
 Solo Flight-D/T 23.95
 Spitfire Ace-D/T 23.95
 Air Rescue I-D/T 23.95
 Challenger-D/T 23.95
 F-15 Strike Eagle-D 23.95

MISCELLANEOUS
 Ken Uston's Blackjack-D 49.95
 Quick Brown Fox-D/Cart 34.95
 Ultima III-D 41.95
 Flight Simulator II-D 37.95
 Night Mission/Pinball-D/T 20.95
 Home Accountant-D 49.95
 Step By Step-D/T 44.95
 Barron's Sat.-D 67.95
 Bristles-D/T 20.95
 Telear 64-Cart 37.95
 Castle Wolfenstein-D 20.95
 Mastertype-D/Cart 27.95
 Aztec-D 27.95
 Miner 2049er-Cart 27.95
 Strip Poker-D 23.95
 Astro Chase-D/T 20.95
 Flip Flop-D/T 20.95
 Beyond Wolfenstein-D 23.95
 Sam-D 41.95
 Mae Assembler-D 49.95
 Jupiter Mission-D 34.95
 Barron-D 37.95
 Tycoon-D 37.95
 Millionaire-D 37.95
 Kwik-Load-D 16.95
 Sargon III-D 34.95
 Air Ralley-D 20.95
 Graphics Basics-D 23.95
 Hes Games-D 23.95
 Multiplan-D 69.95
 Omnewriter/Spell-D 41.95
 Bruce Lee-D/T 23.95
 Mancopter-D 27.95
 Meridian III-D 27.95
 Mastering The Sat-D 104.95
 Hes Forth-Cart 31.95
 Pogo Joe-D/T 20.95
 Movie Maker-D 41.95
 Typing Tutor III-D 34.95
 Space Taxi-D 20.95
 Vip Terminal-D 39.95
 Doodle-D 27.95

PARKER BROTHERS
 Forger II-Cart 34.95
 Gyruess-Cart 34.95
 James Bond-Cart 34.95
 Popeye-Cart 34.95
 O'Bert-Cart 34.95
 Star Wars-Cart 34.95
 Montezuma's Revenge-C 34.95

SCARBOROUGH
 Mastertype-D/Cart 27.95
 Net Worth-D 54.95
 Songwriter-D 27.95
 Run For The Money-D 27.95

SCHOLASTIC
 Call for Items and Prices

SCREENPLAY
 Call for Items and Prices

SEGA
 Call for Items and Prices

SIERRA ON-LINE
 Championship Boxing-D 20.95
 Dark Crystal-D 27.95
 Frogger-D/T 23.95
 Homeword Speller-D 34.95
 Homeword-D 49.95
 Mission Astroid-D 20.95
 Oil's Well-D 23.95
 Quest for Tires-D 23.95
 Threshold-D 27.95
 Time Zone-D 74.95
 Ultima II-D 41.95
 Ultima I-D 23.95
 Ulysses-D 27.95
 Wizard/Princess-D 22.95
 Homeword w/Speller-D 69.95

SPINNAKER
 Adventure Creator-Cart 22.95
 Aerobics-D 27.95
 Alf in the Color Caves-C 22.95
 Alphabet Zoo-Cart 22.95
 Delta Drawing-Cart 22.95
 Facemaker-Cart 22.95
 Fraction Fever-Cart 22.95
 Kids on Keys-Cart 22.95
 Kidwriter-D 22.95
 Snooper #1-D 22.95
 Snooper #2-D 22.95
 Story Machine-Cart 22.95
 Trains-D 22.95

Hundreds of items available for the CBM 64, please call D-Disk T-Cassette Cart - Cartridge

SSI
 50 Million Crush-D 27.95
 Battle/Normandy-D/T 27.95
 Combat Leader-D/T 27.95
 Computer Baseball-D 27.95
 Cosmic Balance-D 27.95
 Eagles-D 27.95
 Fortress-D 23.95
 Germany 1985-D 41.95
 Knight/Desert-D/T 27.95
 Professional Golf-D 27.95
 RFD 1985-D 23.95
 Ringside Seat-D 27.95
 Tigers in the Snow-D 27.95
 Baltic 85-D 23.95
 Broadslides-D 27.95
 Computer Football-D 27.95
 Questron-D 27.95

SYNAPSE
 Blue Max-D/T 23.95
 Drelbs-D/T 23.95
 Fort Apocalypse-D/T 23.95
 Necromancer-D/T 23.95
 New York City-D/T 23.95
 Quasimodo-D/T 23.95
 Relax Stress
 Reduction Sys 94.95
 Slam-Ball-D/T 23.95
 Zaxxon-D/T 27.95
 Zeppelin-D/T 23.95

TIMEWORKS
 Accounts Payable/Checkwriter-D 41.95
 Accounts Receivable/Invoice-D 41.95
 Cash Flow Management-D 41.95
 Data Manager 2-D 34.95
 Data Manager-D/T 19.95
 Dietron-D/T 19.95
 Dungeon Algebra Dragon-D/T 19.95
 Electronic
 Checkbook-D/T 19.95
 General Ledger-D 41.95
 Inventory Management-D 41.95
 Money Manager-D/T 19.95
 Payroll Management-D 41.95
 Evelyn Woods-D 49.95

TRILLIUM
 Amazon-D 22.95
 Dragonworld-D 22.95
 Farenheit 451-D 22.95
 Rendezvous w/Rama 22.95
 Shadowkeep-D 22.95

WAVEFORM
 Call for Items and Prices

WINDHAM CLASSICS
 Below the Root-D 19.95
 Gulliver's Travels-D 19.95
 Swiss Family-D 19.95
 Wizard of Oz-D 19.95

To Order Call Toll Free
800-558-0003 **414-351-2007**

For Technical Info, Order Inquiries, or for Wisc. Orders

NEW LOWER PRICES

ComputAbility™

NEW PRODUCTS

NO SURCHARGE FOR MASTERCARD OR VISA

ORDERING INFORMATION. Please specify system. For fast delivery send cashier's check, money order or direct bank transfers. Personal and company checks allow 2 weeks to clear. Charges for COD are \$3.00. School Purchase Orders welcome. In CONTINENTAL USA, include \$3.00 shipping per software order. Include 3% shipping on all Hardware orders, minimum \$3.00. Mastercard & Visa please include card # and expiration date. WI residents please add 5% sales tax. HI, AK, FPO, APO, Canadian orders - add 5% shipping, minimum \$5.00. All other foreign orders, please add 15% shipping, minimum \$10.00. All goods are new and include factory warranty. Due to our low prices, all sales are final. All defective returns must have a return authorization number. Please call 414-351-2007 to obtain an RA# or your return will NOT be accepted for replacement or repair. Prices and availability are subject to change without notice.

COMPUTABILITY
 P.O. Box 17882
 Milwaukee, WI 53217

ORDER LINES OPEN
 Mon-Fri 11 AM - 7 PM CST
 Sat 12 PM - 5 PM CST

Auto Line

Don Gibson

This handy utility, which is compatible with Automatic Proofreader, automatically numbers a BASIC program as it is being written. It can also quickly delete a range of lines. For the VIC and 64.

Some computers, including Commodore's new Plus/4 and 16, have an auto-number command built into BASIC. You can turn it on whenever you're writing a program; after you enter a program line, the computer figures out the next line number and prints it. You choose what the increment will be: one, three, five, ten, or whatever.

It turns out to be fairly simple to add such a feature to the VIC or 64. "Auto Line," a short machine language wedge, automatically numbers lines, and also serves as a quick-delete utility.

Entering Auto Line

After typing in the program listing, save it to tape or disk before running. The last statement to be executed is a NEW, so the BASIC loader program erases itself after completing the POKEs. If you use Automatic Proofreader, make sure you disable it with RUN/STOP-RESTORE before you save Auto Line.

The 64 version (Program 1) is put into memory starting at location 49152, a safe area for machine language (ML) programs, but the BASIC loader program can move the ML elsewhere if you need the block of memory beginning at 49152 for another purpose. One possibility is the cassette buffer (starting at 828). To relocate the 64 version of Auto Line, change the variable SA (starting address) in line 10 to a safe part of memory.

The VIC version gives you two choices of where the program will go, the cassette buffer or a protected spot at the top of BASIC memory. When you first run it, you will be asked where you want to put Auto Line. If you store programs on tape, avoid using the cassette buffer for Auto Line. Instead, tape users should choose the op-

tion of putting the program at the top of memory, which will subtract 104 bytes from available BASIC RAM.

If you're using 8K or more memory expansion with your VIC, you'll have to change line 10 accordingly. PRINT PEEK(56),PEEK(55) will tell you the normal values for top of memory, which you can then plug into line 10. Or, if you're using expansion memory, you can delete line 10 altogether (the disadvantage to removing the line is that if you run the loader program more than once, the top of memory will move down 104 bytes each time).

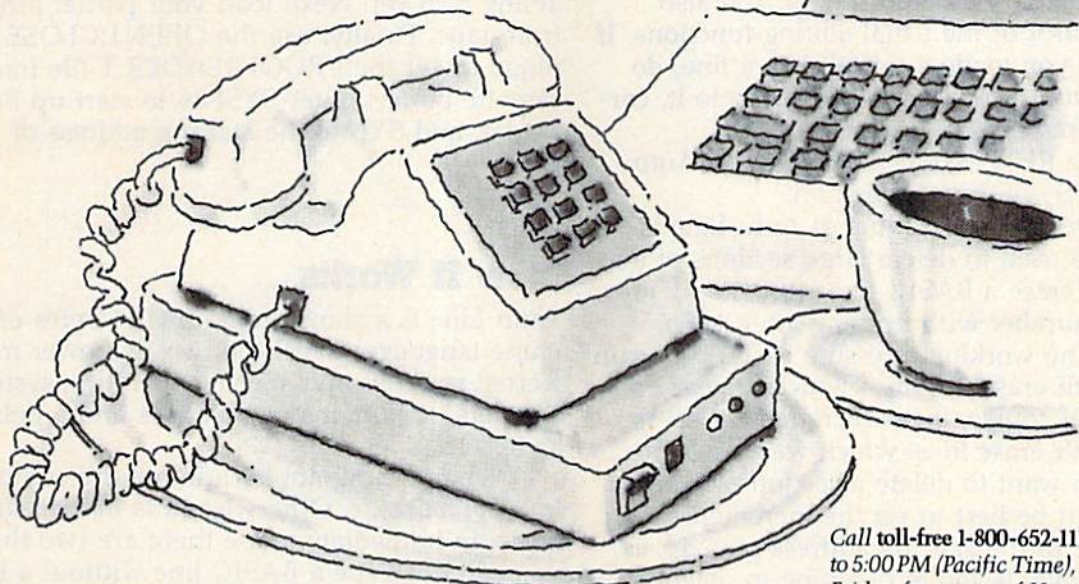
The program defaults to incrementing lines by ten; line 10 is followed by 20, then 30, and so on. You can change this, however. Line 110 of the VIC version (line 60 of the 64 version) sets variable IN (increment) to ten. You can change it to any number from 1 to 255. If you want to change increments in the middle of the program, you can POKE the number you want into SA+46 (SA is the starting address, the SYS number). For example, if you choose to put the program in the cassette buffer, starting at 828, to change to increments of five, POKE 828+46,5 will work (don't use POKE SA+46—the variable SA loses its value after the program is NEWed). Or if you're using the 64 version, starting at 49152, POKE49152+46,20 would change the increment to twenty.

Line Numbering And Line Deleting

After saving Auto Line, type RUN. If you typed it in correctly, you should see a message telling you the SYS number. Write down the number (in case you want to disable Auto Line and then turn it on again). Type SYS and the number on the screen, and the first line number will appear on the screen. The program thinks you're starting at zero, so the first number will be the same as the increment value. It should be ten (unless you changed the increment variable IN as described above).

You can now type a BASIC line, press RETURN, and the next line number appears. Enter

Bank à la Modem



A Tempting Menu of HomeBanking Services from Bank of America

Bank of America brings an appealing menu of services to your personal computer called HomeBanking service.

With HomeBanking service and a Bank of America checking account, you can check your daily balance, review your checking statement records, transfer funds, and even send and receive messages. You can also make payments to more than 800 department stores, utilities, insurance companies, and other financial institutions on-line with HomeBanking service. Plus, you can predate your payments up to 30 days in advance. And our menu of services will be expanding even more! Bank à la modem with all these services for only \$8.00* a month.

Sign up now for HomeBanking service, and we'll give you a special appetizer! You'll have a choice of rebates on any or all of the following:

\$50 off Apple® Modem 1200**

\$30 off Apple Modem 300**

\$30 off Dollars & Sense™ and Forecast™ for Apple personal computers

\$30 off Dollars & Sense with Forecast for IBM and IBM compatible personal computers

\$20 off PFS:® ACCESS for selected MS-DOS and the Apple IIc and IIe personal computers

\$20 off PFS:® WRITE for selected MS-DOS and the Apple IIc and IIe personal computers.

When you sign up for HomeBanking service, you'll receive your rebate package.

Best of all, Bank of America's advanced technology handles all the necessary interface, so HomeBanking service is compatible with any personal computer or terminal with communications capability.

Call toll-free 1-800-652-1111 from 8:00 AM to 5:00 PM (Pacific Time), Monday through Friday, for a taste of HomeBanking service, right on your own personal computer.

Take advantage of our special offer from HomeBanking service today—and begin banking à la modem.

*Regular checking account charges still apply.
**Apple modems must be purchased from an authorized Apple dealer.

Apple is a registered trademark of Apple Computer, Inc.
Dollars & Sense and Forecast are trademarks of Monogram.
PFS: is a registered trademark of Software Publishing Corporation.
Bank of America NT & SA Member FDIC

Mail this coupon to:

Bank of America
HomeBanking Service Center
P.O. Box 306
Half Moon Bay, CA 94019



Yes! I'd like to bank à la modem with HomeBanking service and receive my rebate package.

I am already a Bank of America checking account customer. Please begin my HomeBanking service immediately. I understand charges will become applicable upon sign-up.

Signature _____

Checking Account Number _____

(Special restrictions apply to Cash Maximizer™ accounts.)

VERSATEL® Customer Number (last nine digits on your card) _____

I am not yet a Bank of America checking account customer. Please send me all the information I need to open an account and sign up for HomeBanking service.

Name _____

Address _____

City _____

State _____

Zip _____

Phone (____) _____

Best time to call _____

Act now! You must sign up for HomeBanking service between October 15 and December 31, 1984 to qualify for the rebate offer. (Note: One rebate package per customer. To qualify for rebates you must receive the rebate package prior to your purchase(s). Purchase of hardware or software must be made between October 15, 1984 and March 15, 1985. Proof of purchase will be required.)

For additional information and an on-line demonstration of HomeBanking service, simply call toll-free from 8:00 AM to 5:00 PM (Pacific Time) Monday through Friday: 1-800-652-1111.

BANK ON THE LEADER™

BA Bank of America

the next line and the program continues, automatically printing the appropriate line numbers.

What if you don't want the program to start with line 10? Press the DELete key three times, until the 10 is erased (or just type a SHIFT-RETURN to move to a blank line), then type the line number you want followed by a BASIC line. The program keeps track of the last line number used, and adjusts itself accordingly. You also have full control of the usual editing functions. If you discover you made a mistake on a line, do what you would usually do—cursor up to it, correct it, and press RETURN.

Press the RUN/STOP key to disable Auto Line. The SYS will turn it back on.

An interesting by-product of Auto Line is that it can be used to delete large sections of a program. To erase a BASIC line, you simply enter the line number with nothing after it. So, with Auto Line working, pressing RETURN again and again will erase the lines which appear on the screen. Of course, if the increment is set to ten, you won't erase lines which were later inserted. If you want to delete a section of a program, it might be best to set the increment to 1, with a POKE to the starting address plus 46, as explained above. If you're planning to delete a lot of lines, you'll have to press RETURN many times. POKEing a 128 into location 650 causes all keys (including RETURN) to repeat, and saves wear and tear on your fingers when you're doing a massive delete.

Compatible With Proofreader

Auto Line is also compatible with Automatic Proofreader, so you can use both to type in programs from the GAZETTE (if they're numbered in regular increments). Since Proofreader resides in the cassette buffer, you must not put Auto Line there (and if you're using tape, you must load Auto Line before loading Proofreader). Put Auto Line at 49152 on a 64, at the top of memory on a VIC.

To use the two programs as a combination, change line 70 (64 version) or line 120 (VIC version). Delete the NEW statement at the very end of the line and replace it with LOAD"AUTOPROOF",8 (disk) or LOAD"AUTOPROOF",1 (tape). When you load a program from within another program, it loads and automatically runs.

Tape users can also follow the directions on the Proofreader page for creating a PROOFREADER.T file, placed right after Auto Line, and add OPEN1:CLOSE1 to Auto Line, in place of the NEW statement in line 70 (64 version) or line 120 (VIC version).

You can use both Auto Line and Automatic

Proofreader to work on a partial program which has been saved to tape, but you have to load them in the correct order. First, if you have not done so, create a PROOFREADER.T file (as described in the Proofreader article). Load and run Auto Line, making sure you put it high in memory, with a starting address SA of 49152 on a 64, or top of BASIC in a VIC. Don't enter the enabling SYS yet. Next, load your partial program from tape. Finally, use the OPEN1:CLOSE1 technique to get the PROOFREADER.T file into the cassette buffer. Enter SYS886 to start up Proofreader, and SYS to the starting address of Auto Line.

How It Works

Auto Line is a short program (104 bytes of machine language) which derives its power from Kernal routines and specific operating system pointers. It contains two wedges and a pointer-switch routine.

When a program is running, the computer is in *program mode*. Otherwise, it is in *immediate mode*. In immediate mode there are two things you can do: Type a BASIC line without a line number, for immediate execution (PRINT FRE(0), for example) or enter a line number followed by a BASIC line.

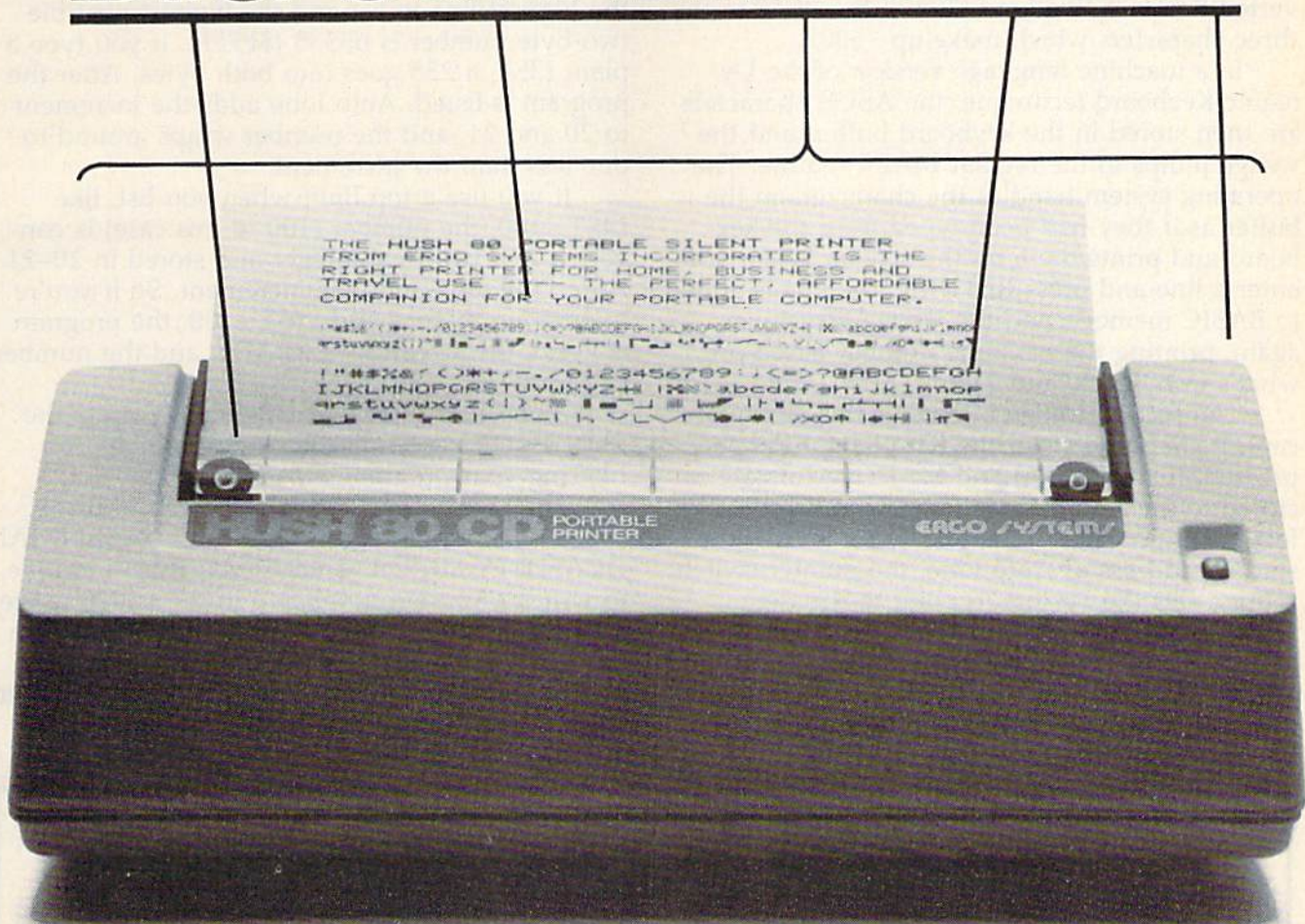
The workhorse routine of BASIC is called MAIN. When the computer is in immediate mode, MAIN calls a subroutine which checks for a keypress. When it finds one, it prints the character on the screen. It also handles things like cursor controls and insertions/deletions. Pressing RETURN sends MAIN to an evaluation routine, which looks for a number at the beginning of the line. If there's a number, the line is tokenized and added to the BASIC program in memory.

Since BASIC line numbers are stored in a Low Byte/High Byte format, the ASCII numbers on the screen have to be translated to two bytes. So if you begin a line with the number 600, the operating system has to change the three characters "6" and "0" and "0" to a low byte 88, high byte 2 (since $88 + 2 * 256$ equals 600). The results of the translation are temporarily stored in zero page locations 20-21 (\$14-15).

A pointer at 770-771 (\$0302-0303) tells BASIC where the MAIN routine is located.

The pointer-switch routine at the beginning of Auto Line changes 770-771 to point to the first wedge. The wedge program checks 20-21 for the last line number and then adds ten (or whatever increment you have chosen) to calculate the next line number. The new integer value (low byte/high byte) is then sent through

BIG ON FEATURES.



\$139⁹⁹

SMALL ON PRICE.

You read that right. A full 80 column, 80 character-per-second, Commodore-compatible dot matrix thermal printer, complete (with a 90 ft. paper roll, interface cable and power pack), ready-to-run — at 800 words per minute — for only \$139.99. But your wallet isn't the only thing the HUSH 80 CD is compatible with. It's compatible with all Commodore models;

including the Commodore 64, the VIC 20, and the new Commodore 264.

And you'll find the HUSH 80 CD printer is big on lots of small things too. It weighs about one-half the amount of its nearest competitor (it's compact size fits conveniently into a briefcase). And it's extremely quiet, with fewer working parts, which means less noise and less to go wrong.

Ask your local computer store or dealer for the HUSH 80 CD today. And if he doesn't carry it, call us at 415/322-ERGO. And find out where to get the little printer that does the big jobs.

**HUSH 80 CD
PRINTER**
LESS PRICE, LESS NOISE,
LESS SIZE.

the integer-to-floating-point conversion routine. The resulting floating point (FP) number is then sent through the BASIC FP-to-ASCII routine, to get the characters which will be printed to the screen. An 88 and 2, for example, would be converted first to a five byte FP number, then to the three characters which make up "600".

In a machine language version of the Dynamic Keyboard technique, the ASCII characters are then stored in the keyboard buffer, and the wedge jumps to the regular MAIN routine. The operating system handles the characters in the buffer as if they had been typed from the keyboard and prints them on the screen. When you enter a line and press RETURN, the line is added to BASIC memory, and the wedge takes over again, printing the next line number based on what's in bytes 20 and 21.

The second wedge intercepts the IRQ interrupt. It checks to see if the STOP key has been pressed. If so, the IRQ and MAIN vectors are restored to their normal values, which has the effect of turning Auto Line off. If you SYS to the starting address of Auto Line, the pointer-switch routine sets the vectors to point to the two wedges, turning Auto Line back on.

One quirk of Auto Line is that if it's running and you LIST a program, the listing will be followed by the usual READY prompt and a number one less than the increment. If you're


numbering by ten, the number nine will follow the READY prompt.

This is because the two bytes which hold the line number (20 and 21) are sometimes used for other purposes. LIST uses 20-21 to keep track of the highest line to list and the highest possible two-byte number is 65535 (\$FFFF). If you type a plain LIST, a 255 goes into both bytes. After the program is listed, Auto Line adds the increment to 20 and 21, and the number wraps around to one less than the increment.

If you use a top limit when you list, like LIST -100, the number (100 in this case) is converted to a two-byte integer and stored in 20-21. Auto Line then adds the increment. So if you're numbering by tens and LIST -100, the program is listed, the screen says READY, and the number 110 appears.

If you find this feature annoying, press the RUN/STOP key to disable Auto Line before LISTing your program.

The highest line number allowed in BASIC is 63999; anything higher will cause an ILLEGAL QUANTITY ERROR. Thus, if you use Auto Line to write a program numbered in the 63000 range, it's possible you'll reach the limit, in which case the bytes at 20-21 are scrambled. It's perhaps best to avoid line numbers in this range, or enter them while Auto Line is turned off.

See program listings on page 195. 

STEVE PUNTER'S NEWEST C-64 WORD PROCESSOR

FEATURING:

- 40 to 160 column video display
- Single pass double column output
- 100% proportional printing capability
- Double sided printing with margin offsets
- Over 30 printers fully supported
- "Bump free" loading - MSD - 2 compatible
- Automatic spelling corrections with Spellpro™

49⁹⁵

Toll Free Order Line

1-800-387-3208

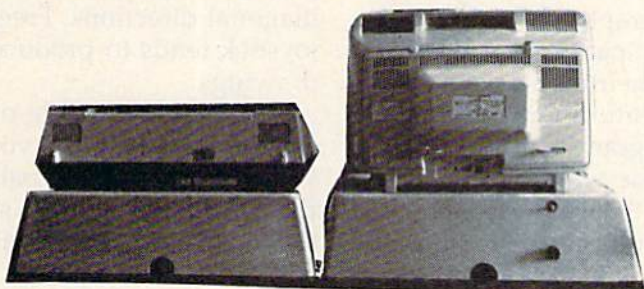


**PRO-LINE
SOFTWARE**

755 The Queensway East, Unit 8, Mississauga, Ontario, Canada L4Y 4C5 . Phone 416-273-6350

INNOVATIVE ORGANIZERS, INC.

For Commodore 64™ & VIC-20™



WELCOME, to the family of **INNOVATIVE ORGANIZERS**. These **ATTRACTIVE** power organizer stands, made of **ABS PLASTICS, U.L. RATED**, provide an opportunity for a more **PROFESSIONAL** looking computer installation, both at **HOME** and in the **WORK PLACE**.

There is **AMPLE** room under the organizer to place all the computer accessories: **POWER SUPPLY, MODEM, GAME CARTRIDGES, MEMORY EXPANSION, and MUCH MORE**.

Now, let's examine how these organizers work. There are 3 CRT-Models.

CRT-1 holds a Monitor or T.V. Set and a VIC 20 or 64. All wires & cartridges fit neatly under the organizer.

CRT-2 same as CRT-1, but also has: **ONE-STEP MASTER SWITCH** (permits 4 pieces of hardware to be turned on and off from one switch, plus circuit protection, incoming power fused with 6AMP Fuse).

CRT-3 same as CRT-2, but also has: **SURGE & SPIKE PROTECTION** built in.

P-D-1: **HOLDS 1525 PRINTER & 1541 DISK DRIVE**.

All wires & cartridges fit neatly under the organizer.

Ask about our Power Lock Switch & Power Portable Computer Fan & 2 Outlet Surge & Spike Protection.



VIC 20 and Commodore 64 are trademarks of Commodore Electronics, L.T.D.

CRT-1	\$ 35.95
CRT-2	\$ 59.95
CRT-3	\$ 79.95
P-D-1	\$ 38.95

Plus Shipping

CALL TO ORDER
317/533-2460

Trouble — DIAL
317/646-8943

Charge it on Visa
or Master Card

Dealer Inquiries Invited

P.O. Box 108, Markleville, IN 46056

Redefined characters, sprites, medium- and high-resolution, page-flipping, fine scrolling, and 16 colors give the 64 some of the best graphics capabilities found on any low-cost computer. But what are graphics good for? Games, at least, make good use of graphics. Business programs can draw detailed colored graphs that extract meaning out of a seemingly patternless mass of numbers. Yet graphics for their own sake—art, if you will—are a valid application for computers.

Computer drawing programs can bring out latent talent, even from those who protest "I just can't draw." One reason is that such programs take away much of the tedium normally associated with creating graphic art. If you can't draw a straight line, or if your circles look more like mutant eggs, you can get the computer to do it for you, with mathematical precision. Those who have been frustrated with pencil and paper will revel in the artistic freedom and power offered by a good drawing program.

Graphics Peripherals

There are several ways to enter graphics into a computer. The most straightforward is a camera that takes pictures and converts them into computer pixels. No skill or technique is necessary; just point the camera and shoot. Unfortunately, camera digitization is usually too expensive for use with a home computer. Even so, it remains a tantalizing alternative. The technology is available; we can only wait for prices to come down.

The keyboard can be used to give commands for circles, lines, and boxes, with the cursor keys used to move around the graphics screen. This can be tediously slow and indirect.

The next step up is a joystick. Instead of

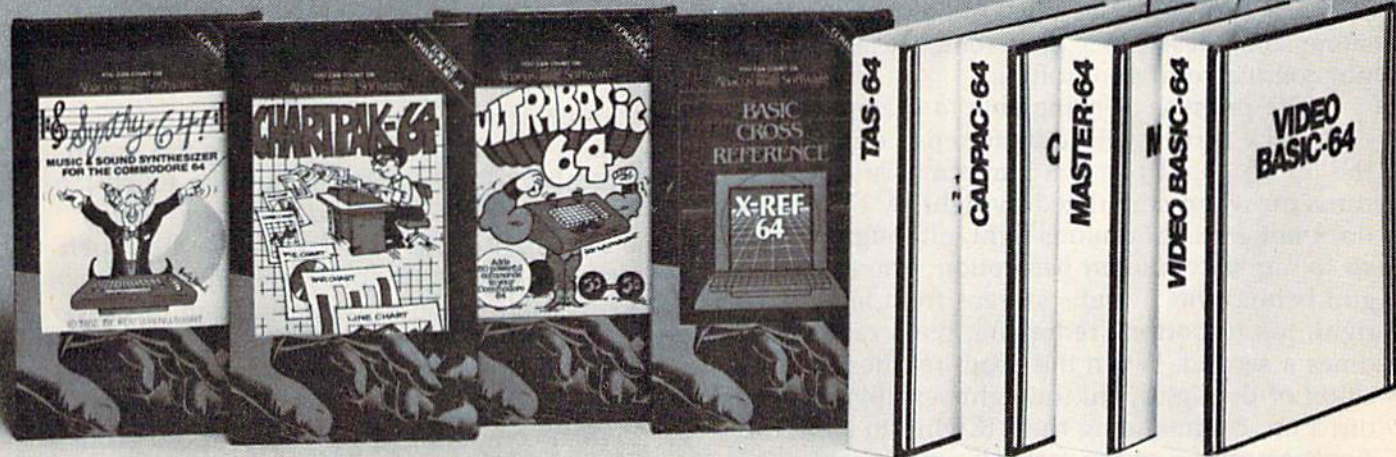
pressing keys labeled with directions, you just push the joystick in the desired direction. Avid game players have developed specialized joystick dexterity, which is instantly applicable to a drawing program. The major drawback of a joystick is that it can only move in four cardinal and four diagonal directions. Freehand drawing with a joystick tends to produce awkward, sharp-angled drawings.

A trackball, made of a billiard ball mounted on two wheels, gives you smoother control. When you move the ball, the wheels spin, and the direction of spin is similar to joystick directions. If you spin the ball forward, an "up" value is returned, the same as if you pressed the joystick forward. Unlike a joystick, a trackball can return a series of directions that better approximate the spin of the ball, so you effectively get more than just eight directions. Any program that works with a joystick will also work with a trackball. A trackball can be imprecise, though, since it tends to keep spinning after you've started it rolling. It can also be difficult to draw straight lines with a trackball, but it's much easier to approximate curves than with a joystick.

Mousing Around

A mouse controller is not a rodent trainer; it's a device similar to an upside-down trackball. As you move the mouse on the desktop, it reports its relative position. The screen cursor mimics the mouse movements. After some practice, moving the cursor with the mouse becomes second nature. The Macintosh and Lisa computers brought the mouse to prominence, and mouse controllers are the latest rage for the Apple II and IBM PC. Some people feel that mouse controllers are a gimmick, and could be replaced by inexpensive

GET THE MOST OUT OF YOUR COMMODORE-64 WITH ABACUS SOFTWARE



XREF-64 BASIC CROSS REFERENCE

This tool allows you to locate those hard-to-find variables in your programs. Cross-references all tokens (key words), variables and constants in sorted order. You can even add you own tokens from other software such as ULTRABASIC or VICTREE. Listings to screen or all ASCII printers.

DISK \$17.95

SYNTHY-64

This is renowned as the finest music synthesizers available at any price. Others may have a lot of onscreen frills, but SYNTHY-64 makes music better than them all. Nothing comes close to the performance of this package. Includes manual with tutorial, sample music.

DISK \$27.95 TAPE \$24.95

ULTRABASIC-64

This package adds 50 powerful commands (many found in VIDEO BASIC, above) - HIRIS, MULTI, DOT, DRAW, CIRCLE, BOX, FILL, JOY, TURTLE, MOVE, TURN, HARD, SOUND, SPRITE, ROTATE, more. All commands are easy to use. Includes manual with two-part tutorial and demo.

DISK \$27.95 TAPE \$24.95

CHARTPAK-64

This finest charting package draws pie, bar and line charts and graphs from your data or DIF, Multiplan and Busicalc files. Charts are drawn in any of 2 formats. Change format and build another chart immediately. Hardcopy to MPS801, Epson, Okidata, Prowriter. Includes manual and tutorial.

DISK \$42.95

CHARTPLOT-64

Same as CHARTPAK-64 for highest quality output to most popular pen plotters.

DISK \$84.95

DEALER INQUIRIES ARE INVITED

FREE CATALOG Ask for a listing of other Abacus Software for Commodore-64 or Vic-20

DISTRIBUTORS

Great Britain:
ADAMSOFT
18 Norwich Ave.
Rochdale, Lancs.
706-524304

Belgium:
Inter. Services
AVG Guillaume 30
Brussel 1160, Belgium
2-660-1447

France:
MICRO APPLICATION
147 Avenue Paul-Doumer
Rueil Malmaison, France
1732-9254

New Zealand:
VISCOUNT ELECTRONICS
306-308 Church Street
Palmerston North
63-86-696

West Germany:
DATA BECKER
Merowingerstr 30
4000 Dusseldorf
0211/312085

Sweden:
TIAL TRADING
PO 516
34300 Almhuft
476-12304

Australia:
CW ELECTRONICS
416 Logan Road
Brisbane, Queens
07-397-0808

Commodore 64 is a reg. T.M. of Commodore Business Machines

CADPAK-64

This advanced design package has outstanding features - two Hires screens; draw LINES, RAYS, CIRCLES, BOXES; freehand DRAW; FILL with patterns; COPY areas; SAVE/RECALL pictures; define and use intricate OBJECTS; insert text on screen; UNDO last function. Requires high quality lightpen. We recommend McPen. Includes manual with tutorial.

DISK \$49.95

McPen lightpen \$49.95

MASTER 64

This professional application development package adds 100 powerful commands to BASIC including fast ISAM indexed files; simplified yet sophisticated screen and printer management; programmer's aid; BASIC 4.0 commands; 22-digit arithmetic; machine language monitor. Runtime package for royalty-free distribution of your programs. Includes 150pp. manual.

DISK \$84.95

VIDEO BASIC-64

This superb graphics and sound development package lets you write software for distribution without royalties. Has hires, multicolor, sprite and turtle graphics; audio commands for simple or complex music and sound effects; two sizes of hardcopy to most dot matrix printers; game features such as sprite collision detection, lightpen, game paddle; memory management for multiple graphics screens. screen copy, etc.

DISK \$59.95

TAS-64 FOR SERIOUS INVESTORS

This sophisticated charting system plots more than 15 technical indicators on split screen; moving averages; oscillators; trading brands; least squares; trend lines; superimpose graphs; five volume indicators; relative strength; volumes; more. Online data collection DJNR/S or Warner. 175pp. manual. Tutorial.

DISK \$84.95

AVAILABLE AT COMPUTER STORES, OR WRITE:

Abacus  Software

P.O. BOX 7211 GRAND RAPIDS, MICH. 49510

For postage & handling, add \$4.00 (U.S. and Canada), add \$6.00 for foreign. Make payment in U.S. dollars by check, money order or charge card. (Michigan Residents add 4% sales tax).



FOR QUICK SERVICE PHONE 616-241-5510

joysticks or trackballs.

However, what business executive would want to be seen using a joystick with *Lotus 1-2-3*? A mouse is an improvement over joysticks, giving precise, natural control. It's a little strange to draw with one, though. We're used to pencil and paper, and drawing with a mouse is like using a pencil point mounted underneath a cigarette package. Since mice must roll about, they consume some desk space, and some surfaces are not conducive to easy rolling.

The promise of being able to draw directly on the TV screen with a light pen is enticing. At the tip of a light pen is a phototransistor, which turns on when stimulated by light. A TV screen does not emit continuous light, although it seems so to our slow human perception. The electron gun behind the TV tube sweeps from left to right, top to bottom, redrawing the screen 60 times a second. When the beam reaches the position of the light pen, the light-sensitive pen turns on, commanding the VIC chip to store the current position of the raster beam. A light pen, then, merely reports its current horizontal and vertical position. You need software to drive a light pen and make it seem that you are drawing directly on the screen.

In practice, light pens have some drawbacks. Foremost is that we're used to drawing on a horizontal surface, whereas a TV screen, of course, is vertical. Holding your arm and hand in the required position can be quickly tiring, often within seconds. Light pens are also imprecise in that the tip of the light pen covers several pixels, making it challenging to exactly position the light pen. Since it's almost impossible to hold the pen rock-steady, the position jitters about, so it's difficult to draw straight or smooth lines. Many light pen programs take several samples of the light pen's position, then compute an average. This alleviates the jitter problem, but slows down on-screen response.

Getting In Touch

Of all the input devices, the touch tablet is the easiest to use. A touch tablet is an inexpensive version of a digital graphics tablet. You draw with a stylus on a rectangular pad, which tells the computer where the pen is on the pad. The most expensive digital pads offer high resolution, using magnetic fields to sense the position of the stylus. Touch tablets sense pressure, and are relatively inexpensive. Since they detect pressure, you can draw with your finger or a blunt stylus. You have to learn to look at the screen while you're drawing, trusting that the tablet will relay your movements. It's easy to trace drawings with a touch tablet, so even if you're not an artist, you can look like one. Tablets offer many of the

advantages of mouse or light pen controllers, and are best for drawing, although the mouse or light pen are easier to use for pointing and making on-screen menu selections.

There are numerous drawing programs available for the 64. To give you an idea of the state of the art (pun intended), we'll take a brief look at some of the most popular drawing programs for the 64: *KoalaPad* from Koala Technologies, the *Tech Sketch Light Pen* with *Micro Illustrator*, *Peripheral Vision* from Futurehouse, and *Doodle!* from City Software.

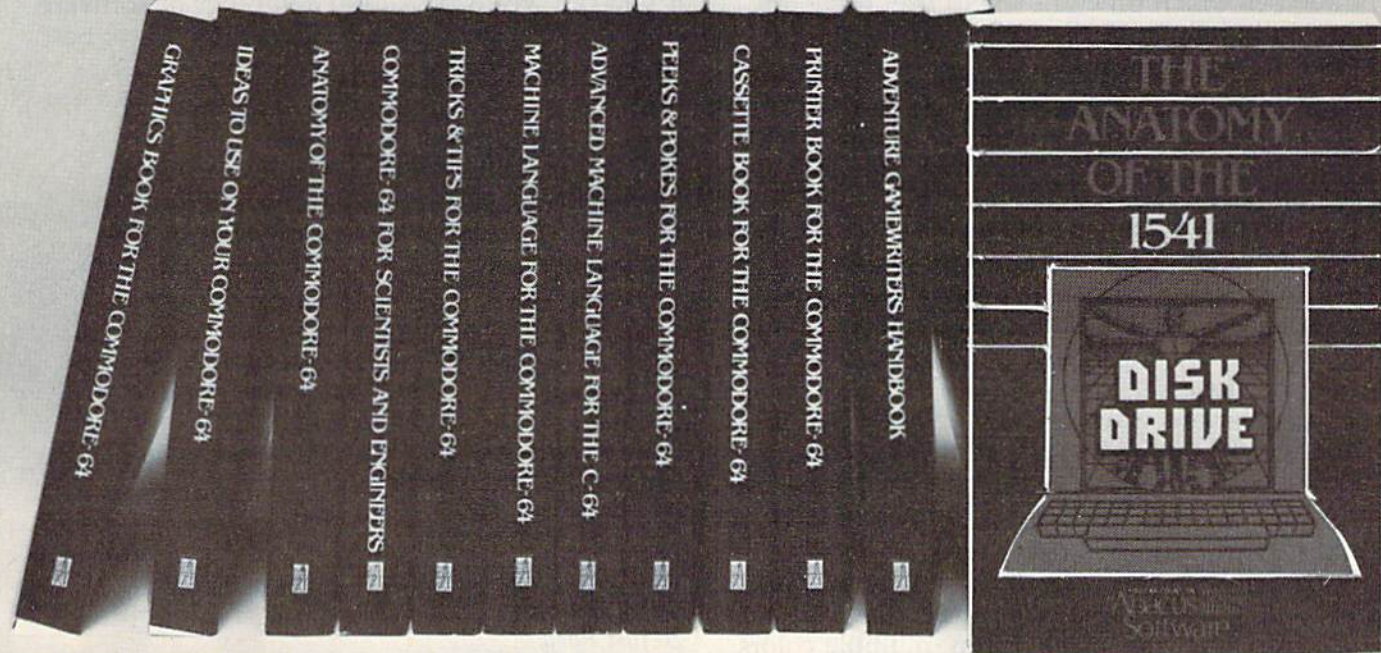
Some drawing programs include the graphics controller. The *KoalaPad* includes a touch tablet, and both *Tech Sketch* and *Peripheral Vision* come with light pens. The *Tech Sketch* light pen has a switch on the tip, but the *Peripheral Vision* lightpen requires you to trigger it from the keyboard. *Doodle!* works with a standard Atari-type joystick, though City Software recommends you use a trackball. The hardware has to be considered when comparing the prices of these products. Both Futurehouse and Koala Technology justify the expense of the hardware by offering a wide range of programs that make good use of the light pen or touch tablet.

Both the *Tech Sketch* light pen and the *KoalaPad* come with very similar versions of *Micro Illustrator*, which Koala Technologies has dubbed *KoalaPainter*. *Micro Illustrator*, which is licensed by Island Graphics, is a popular base for graphics programs on many computers. *KoalaPainter* does offer some improvements over the version of *Micro Illustrator* used by the *Tech Sketch* light pen, but you may want to make your decision in terms of the controller (touch tablet or light pen) and the price. *Micro Illustrator* is one of the easiest graphics programs to learn and use, and versions exist for several computers. Both *Peripheral Vision* and *Doodle!* have features unavailable in *Micro Illustrator*, but are somewhat harder to learn and use. *Micro Illustrator* and *KoalaPainter* both use a full screen menu with pictures and descriptions. You just point to the command you want, then go back to the graphics page. You draw a circle by pressing the button once, then moving the controller. As you move the controller, the circle gets larger or smaller, depending which direction you move. When the circle is the size you like, press the button again to stamp it down. *KoalaPainter* lets you move the circle after you've defined it.

Peripheral Vision draws circles in three steps. First you lay down an X-shaped mark that represents the center of the circle, then you place another mark to represent the outer edge of the circle. Finally, you select the circle by pointing to a small menu at the bottom of the screen. You don't actually see the circle until it's permanently

FOR COMMODORE-64 HACKERS ONLY!

The ultimate source for Commodore-64 Computer Information



OTHER BOOKS AVAILABLE SOON

THE ANATOMY OF THE C-64

is the insider's guide to the lesser known features of the Commodore 64. Includes chapters on graphics, sound synthesis, input/output control, sample programs using the kernal routines, more. For those who need to know, it includes the complete disassembled and documented ROM listings.

ISBN-0-916439-00-3 300pp \$19.95

THE ANATOMY OF THE 1541 DISK DRIVE

unravels the mysteries of using the misunderstood disk drive. Details the use of program, sequential, relative and direct access files. Include many sample programs - FILE PROTECT, DIRECTORY, DISK MONITOR, BACKUP, MERGE, COPY, others. Describes internals of DOS with completely disassembled and commented listings of the 1541 ROMs.

ISBN-0-916439-01-1 320pp \$19.95

MACHINE LANGUAGE FOR C-64

is aimed at those who want to progress beyond BASIC. Write faster, more memory efficient programs in machine language. Test is specifically geared to Commodore 64. Learns all 6510 instructions. Includes listings for 3 full length programs: ASSEMBLER, DISASSEMBLER and amazing 6510 SIMULATOR so you can "see" the operation of the '64.

ISBN-0-916439-02-X 200pp \$14.95

TRICKS & TIPS FOR THE C-64

is a collection of easy-to-use programming techniques for the '64. A perfect companion for those who have run up against those hard to solve programming problems. Covers advanced graphics, easy data input, BASIC enhancements, CP/M cartridge on the '64, POKEs, user defined character sets, joystick/mouse simulation, transferring data between computers, more. A treasure chest

ISBN-0-916439-03-8 250pp \$19.95

GRAPHICS BOOK FOR THE C-64

takes you from the fundamentals of graphic to advanced topics such as computer aided design. Shows you how to program new character sets, move sprites, draw in HIRES and MULTICOLOR, use a lightpen, handle IRQs, do 3D graphics, projections, curves and animation. Includes dozens of samples.

ISBN-0-916439-05-4 280pp \$19.95

ADVANCED MACHINE LANGUAGE FOR THE C-64

gives you an intensive treatment of the powerful '64 features. Author Lothar Englisch delves into areas such as interrupts, the video controller, the timer, the real time clock, parallel and serial I/O, extending BASIC and tips and tricks from machine language, more.

ISBN-0-916439-06-2 200pp \$14.95

IDEAS FOR USE ON YOUR C-64

is for those who wonder what you can do with your '64. It is written for the novice and presents dozens of program listing the many, many uses for your computer. Themes include: auto expenses, electronic calculator, recipe file, stock lists, construction cost estimator, personal health record diet planner, store window advertising, computer poetry, party invitations and more.

ISBN-0-916439-07-0 200pp \$12.95

PRINTER BOOK FOR THE C-64

finally simplifies your understanding of the 1525, MPS/801, 1520, 1526 and Epson compatible printers. Packed with examples and utility programs, you'll learn how to make hardcopy of text and graphics, use secondary addresses, plot in 3-D, and much more. Includes commented listing of MPS 801 ROMs.

ISBN-0-916439-08-9 350pp \$19.95

SCIENCE/ENGINEERING ON THE C-64

is an introduction to the world of computers in science. Describes variable types, computational accuracy, various sort algorithms. Topics include linear and nonlinear regression, CHI-square distribution, Fourier analysis, matrix calculations, more. Programs from chemistry, physics, biology, astronomy and electronics. Includes many program listings.

ISBN-0-916439-09-7 250pp \$19.95

CASSETTE BOOK FOR THE C-64

(or Vic 20) contains all the information you need to know about using and programming the Commodore Datasette. Includes many example programs. Also contains a new operating system for fast loading, saving and finding of files.

ISBN-0-916439-04-6 180pp \$12.95

DEALER INQUIRIES ARE INVITED

IN CANADA CONTACT:

The Book Centre, 1140 Beaulac Street
Montreal, Quebec H4R1R8 Phone: (514) 322-4154

AVAILABLE AT COMPUTER STORES, OR WRITE:

Abacus Software

P.O. BOX 7211 GRAND RAPIDS, MI 49510

Exclusive U.S. DATA BECKER Publishers

For postage & handling, add \$4.00 (U.S. and Canada), add \$6.00 for foreign. Make payment in U.S. dollars by check, money order or charge card. (Michigan Residents add 4% sales tax.)



FOR QUICK SERVICE PHONE (616) 241-5510

Commodore 64 is a reg. T.M. of Commodore Business Machines

drawn, whereas both *Micro Illustrator* and *KoalaPainter* let you preview the circle as you are expanding the size.

Doodle! also does not let you preview the circle, but it's still very easy to draw one. You select the circle mode with a function key. If you can't remember which function key to use, there are some brief help screens available for each command. In the circle mode, the cursor changes to two intersecting arrows. You move the joystick left and right to move the horizontal arrows toward or away from the center. This represents the horizontal axis of the circle or oval. Moving up or down adjusts the vertical arrows. You then press the joystick button, and the joystick can be used to position the cursor. The fire button alternates between moving the cursor and positioning the arrows. You then press the back-arrow key to draw the circle.

The various ways of drawing circles offer a good idea of the philosophy of these programs. While less direct than the others, *Doodle!* makes it easy to draw not just circles, but ovals of any proportion.

Features common to all these programs are freehand drawing, lines, connected lines, rectangles, circles, mirror image, fill-in, multiple colors, and zoom. With *KoalaPainter* or *Micro Illustrator*, you fill in an area by selecting Fill. The cursor changes to the word Fill. You move the cursor inside the figure, then press the button to fill the area. A figure must be completely enclosed, or else the Fill can escape through tiny holes in the outline, sometimes washing over and erasing your entire picture (like trying to fill a leaky swimming pool and ending up flooding your backyard). *Peripheral Vision* is unique here. It quickly traces the outline, and will not perform the Fill unless the outline is complete.

KoalaPainter, *Doodle!*, and *Peripheral Vision* each let you move and copy areas of the screen, although *Micro Illustrator* lacks this feature. *Peripheral Vision's* copy command only copies the outlines of shapes, not what's inside them, but it's fun to watch the cursor continually trace the shape. With *KoalaPainter*, you draw a box around the area you want to move, then press the button. You then move the box, press the button, and the area is copied. *Doodle!* also boxes in the area, but you can actually re-size the shape before you put it down. You can grab a section of the screen, and reduce or enlarge it before you set it down. You can also reverse and flip horizontally and vertically. A unique feature of *Doodle!* produces an effect much like op-art. All the lines within the box are doubled.

In summary, I've found *Micro Illustrator* and *KoalaPainter* to be the easiest to learn and use, with the choice made on the basis of price and

the peripheral used (light pen or touch tablet). *Peripheral Vision* can be purchased with its own light pen, and has some innovative touches. *Doodle!* needs no extra hardware. It's not as easy to learn, but has more features and variations than any of the other drawing programs covered here. If you can, go to your local computer or software store and try them all out. See which one is best for your drawing needs.

KoalaPad with KoalaPainter
Koala Technologies, Inc.
3100 Patrick Henry Drive
Santa Clara, CA 95052-8100
\$99.95 disk; \$110 cartridge

Peripheral Vision
Futurehouse, Inc.
P.O. Box 3470
Chapel Hill, NC 27514
\$39.95; \$59.95 with light pen

Doodle!
City Software
725 West Wisconsin Avenue
Milwaukee, WI 53233
\$39.95

Tech Sketch Light Pen with Micro Illustrator
Tech Sketch, Inc.
26 Just Road
Fairfield, NJ 07006
\$39.95; deluxe version \$119.95

Nobody copies better !!

You deserve to protect your software investment.
You can with the first (and only)
BYTE-FOR-BYTE DISK COPIER for the C-64.



Introducing...

MR. NIBBLE™

The next generation in archival methods is here today!

- No better disk copier at any price
- Easy-to-use — no complicated instructions
- Totally automatic — no knowledge of DOS required
- You'll LOVE MR. NIBBLE™ — if not, return within 10 days for full refund



FULL CIRCLE SOFTWARE, INC.
P.O. Box 1373
Dayton, Ohio 45401
Phone (513) 223-2102

\$49.95 includes shipping & handling
(Ohio residents add 6% sales tax)

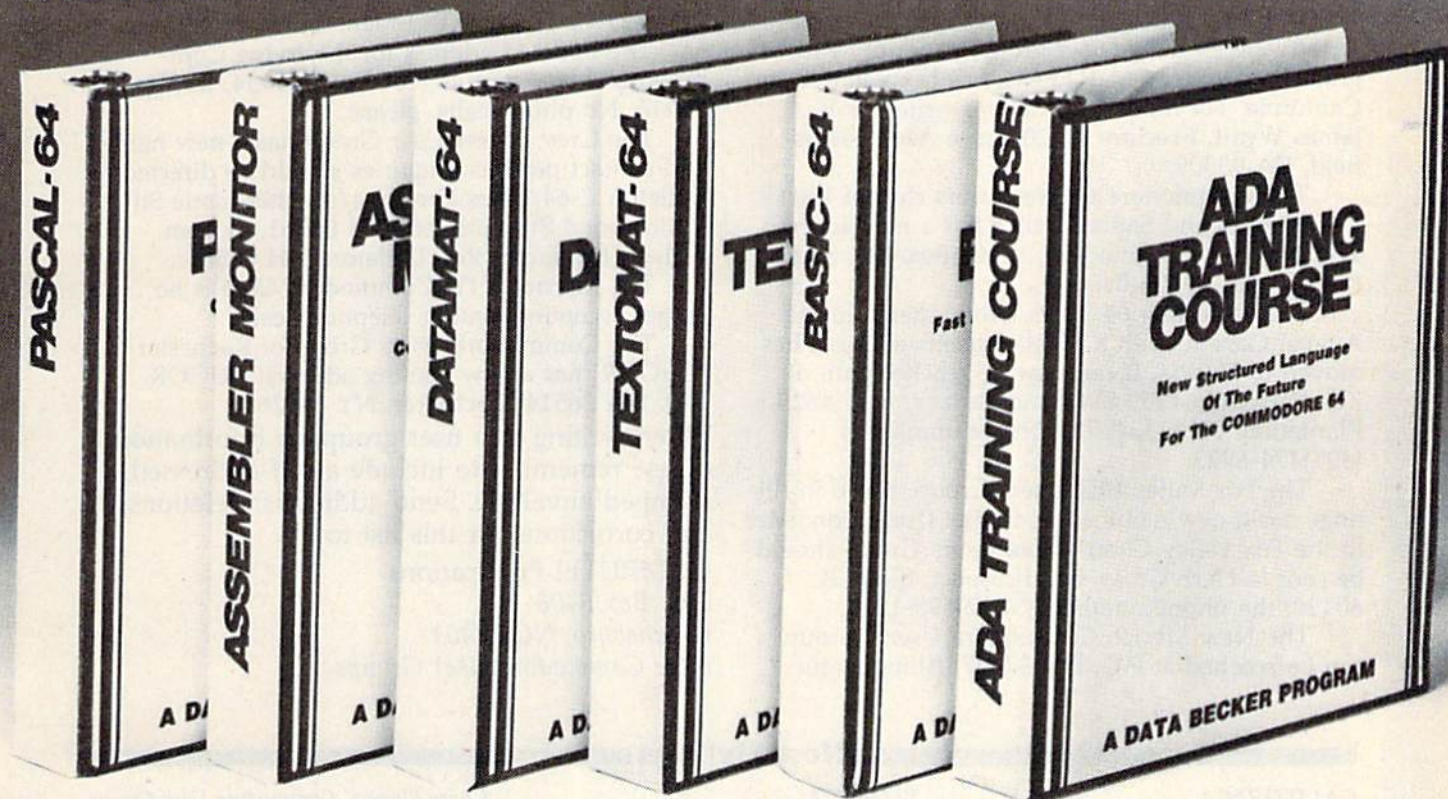


10 day return privilege

"When cloning and disecting fail, turn to MR. NIBBLE™"

SERIOUS 64 SOFTWARE

INDISPENSIBLE TOOLS FOR YOUR COMMODORE 64



PASCAL-64

This full compiler produces fast 6502 machine code. Supports major data Types: REAL, INTEGER, BOOLEAN, CHAR, multiple dimension arrays, RECORD, FILE, SET and pointer. Offers easy string handling, procedures for sequential and relative data management and ability to write INTERRUPT routines in Pascal! Extensions included for high resolution and sprite graphics. Link to ASSEM/MON machine language.

DISK \$39.95

DATAMAT-64

This powerful data base manager handles up to 2000 records per disk. You select the screen format using up to 50 fields per record. DATAMAT 64 can sort on multiple fields in any combination. Complete report writing capabilities to all COMMODORE or ASCII printers.

DISK \$39.93

Available November

TEXTOMAT-64

This complete word processor displays 80 columns using horizontal scrolling. In memory editing up to 24,000 characters plus chaining of longer documents. Complete text formatting, block operations, form letters, on-screen prompting.

Available November DISK \$39.95

ASSEMBLER / MONITOR-64

This complete language development package features a macro assembler and extended monitor. The macro assembler offers freeform input, complete assembler listings with symbol table (label), conditional assembly.

The extended monitor has all the standard commands plus single step, quick trace breakpoint, bank switching and more.

DISK \$39.95

BASIC-64

This is a full compiler that won't break your budget. Is compatible with Commodore 64 BASIC. Compiles to fast machine code. Protect your valuable source code by compiling with BASIC 64.

Available December

DISK \$39.95

ADA TRAINING COURSE

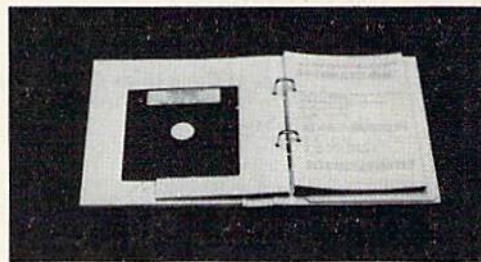
This package is an introduction to ADA, the official language of the Department of Defense and the programming language of the future. Includes editor, syntax checker/compiler and 110 page step by step manual describing the language.

Available November

DISK \$79.95

OTHER NEW SOFTWARE COMING SOON!

All software products featured above have inside disk storage pockets, and heavy 3-ring-binder for maximum durability and easy reference.



DEALER INQUIRIES INVITED

AVAILABLE AT COMPUTER STORES, OR WRITE:

Abacus Software

P.O. BOX 7211 GRAND RAPIDS, MI 49510

Exclusive U.S. DATA BECKER Publishers

For postage & handling, add \$4.00 (U.S. and Canada), add \$6.00 for foreign. Make payment in U.S. dollars by check, money order or charge card. (Michigan Residents add 4% sales tax.)



FOR QUICK SERVICE PHONE (616) 241-5510

Commodore 64 is a reg. T.M. of Commodore Business Machines

User Group Update

Changes

A software exchange user group, American Program Exchange 64 (A.P.E. 64), has been started in California. For more information, write A.P.E., James Wyatt, Executor, 3820 Brave Ave., Bakersfield, CA 93309.

The Commodore 64 West users club of West Los Angeles and Santa Monica has a new address. The club can be contacted at P.O. Box 406, Santa Monica, CA 90406-0406.

The Suburban 64 Users Group, listed in the August Gazette with a Massachusetts address, has moved to Florida. It can now be reached care of Ken Partridge, 1360 SW 82nd Terrace, Apt. #625, Plantation, FL 33324. The phone number is (305)474-6923.

The Fox Valley PET Users Group, based in Illinois, has a new name and address. Correspondence to the Fox Valley Commodore Users Group should be sent to Herb Gross, 833 Prospect, Elgin, IL 60120; the phone number is (312)695-1316.

The New Mexico Commodore User's Group can be reached at P.O. Box 37127, Albuquerque,

NM 87176. The new president is Susan Palmer.

The updated address for the Irving Commodore User Group is P.O. Box 165034, Irving, TX 75016. No phone calls, please.

The Grey Locker User Group has a new name and contact persons. Inquiries should be directed to Littleton C-64 Users Group, c/o either Jamie Silva, 8 Richmond St., Littleton, NH 03561, or Tom Walker, Mt. Eustis Rd., Littleton, NH 03561.

The Merrick (NY) Commodore Club is no longer accepting mail or telephone calls.

The Commodore Users Group of Rochester (CUGOR) has a new mailing address: CUGOR, P.O. Box 26514, Rochester, NY 14626.

When writing to a user group for information, please remember to include a self-addressed, stamped envelope. Send additions, deletions, and corrections for this list to:

COMPUTE! Publications

P.O. Box 5406

Greensboro, NC 27403

attn: Commodore User Groups

New Listings

CALIFORNIA

Pasadena Commodore Computer Club
Ernie McDonald
P.O. Box 1163
Arcadia, CA 91006
(818)904-0607

Fresno Commodore Users Group
Greg Edwards
091 W. 9th, #203
Clovis, CA 93612

San Bernardino Commodore 64 Club
Carl Gardenas
1804 N. Dundee
Highland, CA 92346
(714)864-4498

**Simply Users of Computers Combining
Experience for Strength and Success
(SUCCESS)**
Wayne Weichel
301 Veronica Drive
Paso Robles, CA 93446
(805)238-6294

COLORADO

**Colorado Springs Computer Society
(CSCS)**
Michael V. Brazonis
QTRS 5938-A
Colorado Springs, CO 80913
(303)576-4219

Western Slope Commodore User Group
c/o On Screen Computer Store
535 Main Street
Grand Junction, CO 81501
(303)242-0083

DELAWARE

First State Commodore Club
P.O. Box 1313
Dover, DE 19903

FLORIDA

**Lake Sumter Commodore Users Group
(L.S.C.U.G.)**
Roger Coffey
P.O. Box 416
Leesburg, FL 32748
(904)343-2688

**The Central Florida Commodore User's
Club, Inc.**
Thurman Lawson
P.O. Box 15949
Orlando, FL 32858
(305)886-0390

GEORGIA

CCC64UG
P.O. Box 842
Morroe, GA 30260

Covington C-64 User Group
Keith L. Brown
P.O. Box 642
Oxford, GA 30267

IDAHO

**Coeur d' Alene Computer Club
C Fifth (Commodore Chapter)**
Gary Edwards
506 Lunceford Lane
Coeur d' Alene, ID 83814
(208)765-3803

ILLINOIS

East Side Computer Club
3103 Clay Street
Alton, IL 62002
(618)462-7136

Gateway Computer Club
Richard Fisher
P.O. Box 207
Belleville, IL 62222

Chess Players' Commodore User Group
John R. Menke
723 Barton Street
Mt. Vernon, IL 62864

Spud Users Group
P.O. Box 471
River Forest, IL 60305
BBS: (312)456-0395 or
(312)344-SPUD

INDIANA

Fulton County Commodore User's Group
Brian Eshelman
R.R. 1, Box 22
Rochester, IN 46975
(219)223-2672

or
Jim Tyler
1703 Madison Ave.
Rochester, IN 46975
(219)223-4430

IOWA

Penn City User Group
James A. Lair
R.R. 1, Box 390
Fort Madison, IA 52627
(319)372-1648

KENTUCKY

Glasgow Commodore User's Group
Steve England
P.O. Box 154
Glasgow, KY 42141

MARYLAND

**Olney Square Commodore User Group
(OSUG)**
Jon Hadidi
18629 Hedgegrove Terrace
Olney, MD 20832
(301)774-6051

MASSACHUSETTS

Pioneer Valley VIC/64 Club
Mickey Yale
6 Laurel Terrace
Westfield, MA 01085
(413)562-1027

MICHIGAN

Downriver Commodore Group
Ron Marshall
17029 Keppen
Allen Park, MI 48101
(313)274-2589

Mid-Michigan Commodore Club
Virgil Graham
Clare, MI 48617
(517)386-3429

Detroit Area Users' Group
Larry Hutson
828 Fairwood
Inkster, MI 48141
(313)277-5557

MISSISSIPPI

Jackson Commodore Users Group
Mike Green
P.O. Box 55734
Jackson, MS 39216
(601)372-1866 (after 6 p.m.)

MISSOURI

Commodore Users Group of Warrensburg (CUGW)
Buck Sommerkamp
P.O. Box 893
Warrensburg, MO 64093
(816)747-2406

NEW JERSEY

METRO Commodore
Matthew Staller
567 Sanderling Court
Harmon Cove, NJ 07094
(201)867-5283

Info-64
c/o Video Dynamics, Ltd.
16 W. Ridgewood Ave.
Ridgewood, NJ 07450
(201)447-4422

NEW YORK

CNY Commodore Users Group
4187 Burningtree Road
Liverpool, NY 13088
(315)652-7491

OHIO

Commodore Computer Club of Toledo (CCCT)
c/o President
P.O. Box 8909
Toledo, OH 43623

PENNSYLVANIA

Butler Commodore 64 User Group
P.O. Box 2408
Butler, PA 16001

SOUTH CAROLINA

Rock Hill Commodore User Group (RHCU)
Robbie Smarzik
565 Scaleybark Circle
Rock Hill, SC 29730
(803)366-7918

TENNESSEE

Commodore Computer Club
Marty Garner
P.O. Box 96
Estill Springs, TN 37330
(615)649-5962

TEXAS

Saturday Morning Users Group (S.M.U.G.)
David Staggs (512)937-5045, or
Jim O'Rear (512)854-4156
1717 Graham
Corpus Christi, TX 78418

Commodore User's Group of Odessa (CUGO)
Charlotte Holley
2904 N. Alleghaney
Odessa, TX 79764
(915)332-2582

The Users
Brad Lewis
209 Altavista
Rockwall, TX 75087
(214)722-9774

VIRGINIA

Commodore 64 Computer Users Group of Richmond, Virginia
R.S. Armstrong, Jr.
P.O. Box 9078
Richmond, VA 23225

WASHINGTON

Commodore Computing Exchange
Phillip King
16821 1st Ave. S.E.
Bothell, WA 98012

C-64 & VIC-20 Club
Rich Larsson
6462 N.E. 154th
Bothell, WA 98011

White River Commodore 64 User's Group
Dana L. Seaney
2649 Warner Ave. W. #69
Enumclaw, WA 98022
(206)825-1880

Whidbey Island Commodore Computer Club
Michael D. Clark
P.O. Box 1471
Oak Harbor, WA 98277
(206)675-8535

Tri-Cities Commodore Computer Club (TC-3)
Jack Garvin
1926 Pine Street
Richland, WA 99352
(509)943-4734

WISCONSIN

Beaver Dam Commodore Users Group
Rich Schneider
Rte. 2, Box 231
Columbus, WI 53925

Janesville Area Commodore Users Group
Charles Williams
P.O. Box 1858
Janesville, WI 53547

Fond du Lac Area Commodore Users Club
Dick Lendl
1504 Shelley Court
North Fond du Lac, WI 54935

WYOMING

ZYMEC Users Group
Tim Struna
Rte. 63, Box 357
11 Birchfield Lane
Lander, WY 82520
(307)332-7655
(307)332-2151

OUTSIDE THE U.S.

St. Catharines C-64 Group
Wesley Scharff
196 Scott #222
St. Catharines
Ontario, Canada L2N 5T2
(416)934-7250

Niagara Peninsula Commodore User Group
Joe Wiebe
R.R. #3 East/West Line
Niagara-on-the-Lake
Ontario, Canada L0S 1J0
(416)937-4828

Canadian Commodore 64 Users Group
Graham Bell
R.R. #4
Niagara-on-the-Lake
Ontario, Canada L0S 1J0

C-64 Users Group of Montreal (C.U.G.O.M.)
Robert Adler
Snowdon P.O. Box 792
Montreal
Quebec, Canada H3X 3X9
(514)739-3046

Helsinki Area VIC User Group
Matti Aarnio
Linnustajankj 2B7
SF-02940 ESPOO
Finland

IHS division: Users
contact: Massimiliano Lisa
Via Borgonuovo 19
Milano, Italy

Marlborough Commodore Users Group
Robin Vercoe
42 Rogers Street
Blenheim
Marlborough, New Zealand

Commodore Users' of Panama (C.U.P.)
Raymond Dragseth
Box 1487
Balboa Ancon,
Republic of Panama
Phone: 60-4758
BBS: 82-3336

Commodore Hardware Users Group—Riyadh (CHUG-R)
Don W. Fry, Jr.
USREP/JECOR-CENPRO
Box 259
APO NY 09038

Note: This user group is in Saudi Arabia. The above address should be used by people with APO privileges, or by U.S. user groups. Persons using international or Saudi Arabian mail should use the following address:

CHUG-R
Don W. Fry, Jr.
USREP/JECOR-CENPRO B-259
P.O. Box 5927
Riyadh, Saudi Arabia 11432

Baden Computer Club
P.O. Box 1219
C.F.P.O. 5056
Belleville, Ontario
Canada K0K 3R0
(This club is in West Germany.)

COMPUTER AND SOFTWARE SALE

COMMODORE 64

(more power than Apple II at 1/3 the price)

\$188.00*

- 170K Disk Drive \$249.00*
 - Tractor Friction Printer \$169.00*
 - 14" Hi-Res Color Monitor \$219.00*
- *less coupon discount

WE
HAVE
THE
BEST
SERVICE

WE
HAVE
THE
LOWEST
PRICES

AUTO DIAL MODEM 64

(Best communications package in USA)

\$79.00*

- Computer Learning Pad \$49.00
- New Voice Synthesizer \$59.00
- Commodore 64 Power for Vic-20 \$69.00

SPECIAL SOFTWARE COUPON

We pack a SPECIAL SOFTWARE DISCOUNT COUPON with every COMMODORE 64 COMPUTER DISK DRIVE-PRINTER-MONITOR we sell! This coupon allows you to SAVE OVER \$500 OFF SALE PRICES!!

(Examples) PROFESSIONAL SOFTWARE COMMODORE 64

Name	List	Sale	Coupon
Executive Word Processor	\$99.00	\$49.00	\$39.00
Executive Data Base	\$69.00	\$35.00	\$24.00
20,000 Word Dictionary	\$24.95	\$14.95	\$10.00
Electronic Spread Sheet	\$59.95	\$49.00	\$39.00
Accounting Pack	\$49.00	\$39.00	\$29.00
Practical: Programmers Reference Guide	\$20.95	\$16.95	\$12.50
Programmers Helper (Disk)	\$59.95	\$39.95	\$29.95
80 Column Screen (Disk)	\$59.95	\$39.95	\$29.95
Flip & File Disc Filer	\$39.95	\$16.95	\$14.95
Deluxe Tape Cassette	\$89.00	\$49.00	\$39.00
Pro Joy Stick	\$24.95	\$15.95	\$12.00
Light Pen	\$39.95	\$16.95	\$14.95
Dust cover	\$8.95	\$6.95	\$4.60
Pogo Joe	\$29.95	\$19.95	\$16.95
Priston II Epyx	\$39.95	\$29.95	\$26.00*
			*Plus One FREE
Music Calc	\$59.95	\$39.95	\$34.95
Filewriter	\$59.95	\$39.95	\$34.95

(See over 100 coupon items in our catalog)

Write or call for
Sample SPECIAL SOFTWARE COUPON!

* COMMODORE 64 COMPUTER \$188.00

You pay only \$188.00 when you order the powerful 84K COMMODORE 64 COMPUTER! LESS the value of the SPECIAL SOFTWARE COUPON we pack with your computer that allows you to SAVE OVER \$500 off software sale prices!! With only \$100 of savings applied, your net computer cost is \$88.00!!

* 170 DISK DRIVE \$249.00

You pay only \$249.00 when you order the 170K Disk Drive! LESS the value of the SPECIAL SOFTWARE COUPON we pack with your disk drive that allows you to SAVE OVER \$100 off software sale prices!! With only \$500 of savings applied, your net disk drive cost is \$149.00

* 80 COLUMN 80CPS TRACTION FRICTION PRINTER \$169.00

You pay only \$169.00 when you order the Comstar T/F deluxe line printer that prints 8 1/2 x 11 full size, single sheet, roll or fan fold paper, labels etc. Impact dot matrix, bidirectional, LESS the value of the SPECIAL SOFTWARE COUPON we pack with your printer that allows you to SAVE OVER \$500 off software sale prices!! With only \$100 of saving applied your net printer cost is only \$69.00.

* 14" HI-RES COLOR MONITOR \$219.00

You pay only \$219.00 when you order this 14" COLOR MONITOR with sharper and clearer resolution than any other color monitors we have tested! LESS value of the SPECIAL DISCOUNT COUPON we pack with your monitor that allows you to save over \$500 off software sale prices!! With only \$100 of savings applied your net color monitor cost is only \$119.00 (16 Colors).

80 COLUMN BOARD \$99.00

Now you program 80 COLUMNS on the screen at one time! Converts your Commodore 64 to 80 COLUMNS when you plug in the 80 COLUMN EXPANSION BOARD!! PLUS 4 slot expander! Can use with most existing software.

80 COLUMNS IN COLOR EXECUTIVE WORD PROCESSOR \$49.00

This EXECUTIVE WORD PROCESSOR is the finest available for the COMMODORE 64 computer! The ULTIMATE FOR PROFESSIONAL Word Processing DISPLAYS 40 or 80 COLUMNS IN COLOR or Black and White! Simple to operate, powerful text editing with 250 WORD DICTIONARY, complete cursor and insert/delete key controls line and paragraph insertion, automatic deletion, centering, margin settings and output to all printers! Includes a powerful mail merge.
List \$99.00 SALE \$49.00 Coupon \$39.00

EXECUTIVE QUALITY PROFESSIONAL BUSINESS SOFTWARE

The Cadillac of Business Programs
for Commodore 64 Computers

Item	List	*SALE	Coupon
Inventory Management	\$99.00	\$49.00	\$35.00
Accounts Receivable	\$99.00	\$49.00	\$35.00
Accounts Payable	\$99.00	\$49.00	\$35.00
Payroll	\$99.00	\$49.00	\$35.00
General Ledger	\$99.00	\$49.00	\$35.00

* SUPER AUTO DIAL MODEM \$79.00

Easy to use. Just plug into your Commodore 64 computer and you're ready to transmit and receive messages. Easier to use than dialing your telephone just push one key on your computer! Includes exclusive easy to use program for up and down loading to printer and disk drives. List \$129.00 SALE \$79.00.

NEW COMPUTER LEARNING PAD \$49.00

makes other graphics tablet obsolete. This new TECH SCETCH LEARNING PAD allows you to draw on your T.V. or Monitor and then you can print whatever you draw on the screen on your printers. FANTASTIC!!! List \$79.95 SALE \$49.00 Coupon \$39.95

NEW VOICE SYNTHESIZER \$59.00

For Com-64 or VIC-20 computers. Just plug it in and your can program words and sentences, adjust volume and pitch, make talking adventure games, sound action games and customized talkies!! FOR ONLY \$19.95 you can add TEXT TO SPEECH, just type a word and hear your computer talk—ADD SOUND TO "ZORK", SCOTT ADAMS AND AARDVARK ADVENTURE GAMES!! (Disk or tape).

COM-64 POWER FOR VIC-20 \$69.00

Just plug in our 32K RAM MEMORY EXPANDER and you get as much usable programming power as the Commodore-64 computer!! Master control switches on cover. Gold Edge connectors, five year warranty (FREE \$29.95 CARTRIDGE GAME).

16K RAM CARTRIDGE \$49.00

Increases VIC-20 programming power 4 times. Expands total memory to 41K (41,000 bytes). Memory block switches are on outside cover! CARDCO Includes FREE \$29.95 game!!

9" GREEN SCREEN MONITOR \$69.95

Excellent quality SANYO, easy to read, 80 columns x 24 lines. Green Phosphorous screen with anti-glare, metal cabinet! Saves your T.V. PLUS \$9.95 for connecting cable. Com-64 or VIC-20.

12" GREEN OR AMBER MONITOR \$99.00

Your choice of green or amber screen monitor top quality, SANYO 80 columns x 24 lines, easy to read, anti-glare, faster scanning! PLUS \$9.95 for connecting cable. Com-64 or VIC-20.

PHONE ORDERS

8AM - 8PM Weekdays
9AM - 12N Saturdays

- LOWEST PRICES • 15 DAY FREE TRIAL • 90 DAY FREE REPLACEMENT WARRANTY
- BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

Add \$10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders. 1 day express mail!

VISA — MASTER CARD — C.O.D.

PROTECTO ENTERPRISES

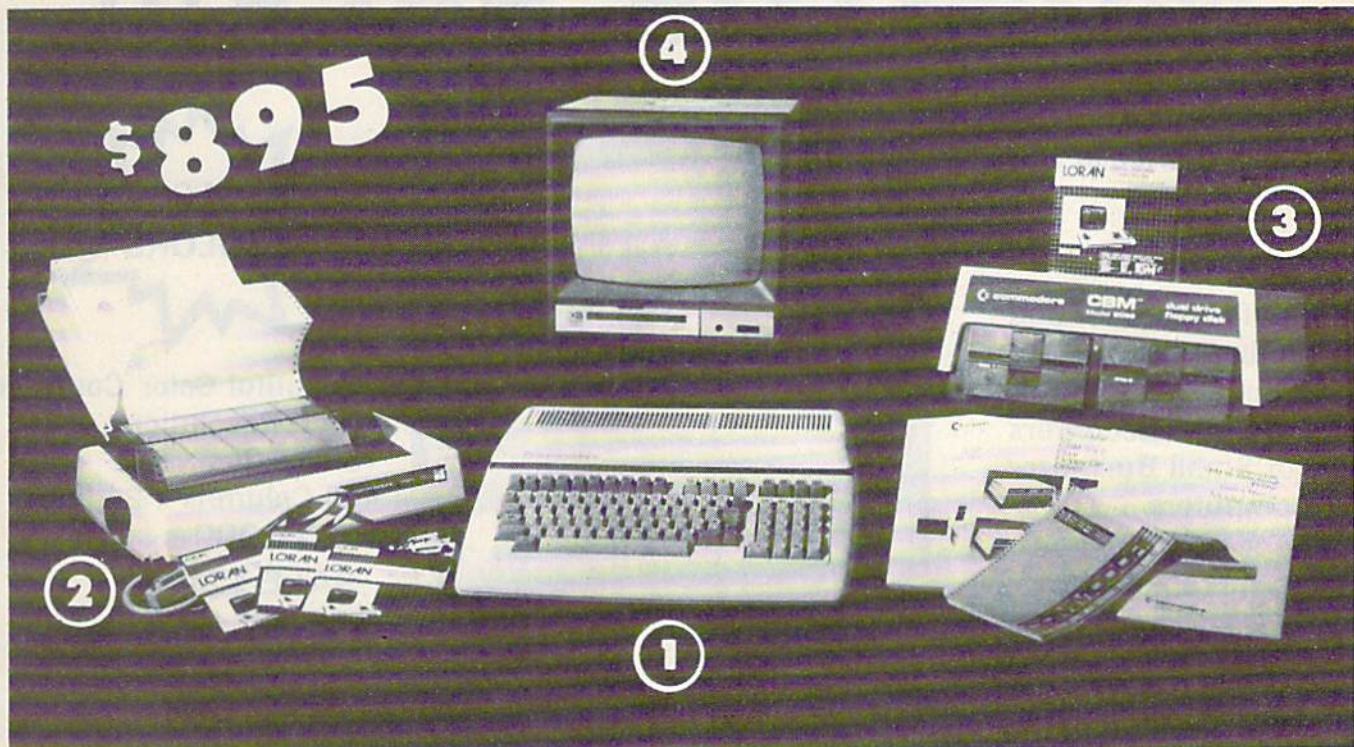
(WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

NEW 128K —MEGA BYTE DUAL DISK DRIVE—80 COLUMN

COMPUTER SYSTEM SALE!

HOME • BUSINESS • WORD PROCESSING



LOOK AT ALL YOU GET FOR ONLY **\$895.**

- | | | |
|--|------------|-----------|
| ① B128 COMMODORE 128K 80 COLUMN COMPUTER | LIST PRICE | \$ 995.00 |
| ② 4023 - 100 CPS - 80 COLUMN BIDIRECTIONAL PRINTER | | 499.00 |
| ③ 8050 DUAL DISK DRIVE (over 1 million bytes) | | 1795.00 |
| ④ 12" HI RESOLUTION 80 COLUMN MONITOR | | 249.00 |
| • BOX OF 10 LORAN LIFETIME GUARANTEED DISKS | | 49.95 |
| • 1100 SHEETS FANFOLD PAPER | | 19.95 |
| • ALL CABLES NEEDED FOR INTERFACING | | 102.05 |

TOTAL LIST PRICE **\$3717.95**



PLUS YOU CAN ORDER THESE BUSINESS PROGRAMS AT SALE PRICES

	LIST	SALE		LIST	SALE
Professional 80 Column			Payroll	\$149.95	\$99.00
Word Processor	\$149.95	\$99.00	Inventory	\$149.95	\$99.00
Professional Data Base	\$149.95	\$99.00	General Ledger	\$149.95	\$99.00
Accounts Receivable	\$149.95	\$99.00	Financial Spread Sheet	\$149.95	\$99.00
Accounts Payable	\$149.95	\$99.00			

PRINTER REPLACEMENT OPTIONS

(replace the 4023 with the following at these sale prices)

	LIST	SALE
Olympia Executive Letter Quality Serial Printer	\$699.00	\$399.00
Comstar Hi-Speed 160 CPS 15 1/2" Serial Business Printer	\$779.00	\$499.00
Telecommunications Deluxe Modem Package	\$199.00	\$139.00

15 DAY FREE TRIAL. We give you 15 days to try out this SUPER SYSTEM PACKAGE!! If it doesn't meet your expectations, just send it back to us prepaid and we will refund your purchase price!!

90 DAY IMMEDIATE REPLACEMENT WARRANTY. If any of the SUPER SYSTEM PACKAGE equipment or programs fail due to faulty workmanship or material we will replace it IMMEDIATELY at no charge!!

Add \$50.00 for shipping and handling!!

\$100.00 for Alaska and Hawaii orders.

WE DO NOT EXPORT TO OTHER COUNTRIES

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!! We accept Visa and MasterCard. We ship C.O.D. to continental U.S. addresses only.

PROTECTO ENTERPRISES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

14" COLOR MONITOR SALE!!!

(Lowest price in USA)

- Built in speaker and audio
- Front Panel Controls
- For Video Recorders
- For Small Business/Computers
- Apple-Commodore Atari-Franklin-etc.



14" Color Computer Monitor



- Beautiful Color Contrast
- High Resolution
- Sharp Clear Text
- 40 Columns x 24 lines
- List \$399
SALE \$219

15 Day Free Trial - 90 Day Immediate Replacement Warranty

12" ZENITH HI-RESOLUTION GREEN OR AMBER TEXT DISPLAY MONITOR
List \$249 **SALE \$119**

80 Columns x 24 lines, Hi-Resolution-crisp clear easy to read text with anti glare screen! A Must for word processing.

12" SANYO GREEN OR AMBER SCREEN MONITOR List \$199 **SALE \$99**
80 Columns x 24 lines, amber or green text display, easy to read, no eye strain, up front controls.

9" SANYO GREEN SCREEN DATA MONITOR List \$149 **SALE \$69**
80 Columns x 24 lines easy to read, up front controls metal cabinet.

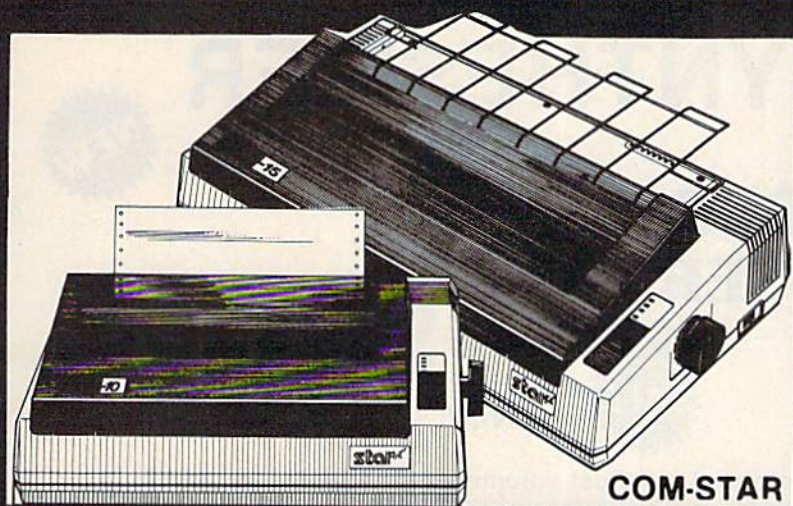
• LOWEST PRICES • 15 DAY FREE TRIAL • 90 DAY FREE REPLACEMENT WARRANTY
• BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

Add \$10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$20.00 for CANADA, PUERTO RICO, HAWAII orders. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. Visa - MasterCard - C.O.D.

**PROTECTO
ENTERPRIZES** (WE LOVE OUR CUSTOMERS)
BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

FANTASTIC COMPUTER PRINTER SALE!!!



COM-STAR T/F

Tractor
Friction
Printer

only \$ **169****

• **Lowest Priced, Best Quality, Tractor-Friction Printers in the U.S.A.**

- **Fast 80-120-160 Characters Per Second** • 40, 46, 66, 80, 96, 132 Characters Per Line Spacing
- **Word Processing** • **Print Labels, Letters, Graphs and Tables** • **List Your Programs**
- **Print Out Data from Modem Services** • **"The Most Important Accessory for Your Computer"**

** DELUXE COMSTAR T/F 80 CPS Printer — \$169.00

This COMSTAR T/F (Tractor Friction) PRINTER is exceptionally versatile. It prints 8½" x 11" standard size single sheet stationary or continuous feed computer paper. Bi-directional, impact dot matrix, 80 CPS, 224 characters (Centronics Parallel Interface).

Premium Quality 120-140 CPS 10" COM-STAR PLUS+ Printer \$249.00

The COM-STAR PLUS+ gives you all the features of the COMSTAR T/F PRINTER plus a 10" carriage, 120-140 CPS, 9x9 dot matrix with double strike capability for 18 x 18 dot matrix (near letter quality), high resolution bit image (120 x 144 dot matrix), underlining, back spacing, left and right margin settings, true lower decenders with super and subscripts, prints standard, italic, block graphics and special characters. It gives you print quality and features found on printers costing twice as much!! (Centronics Parallel Interface) (Better than Epson FX80). List \$499.00 **SALE \$249.00**

Premium Quality 120-140 CPS 15½" COM-STAR PLUS+ Business Printer \$349.00

Has all the features of the 10" COM-STAR PLUS+ PRINTER plus 15" carriage and more powerful electronics components to handle large ledger business forms! (Better than Epson FX 100). List \$599 **SALE \$349.00**

Superior Quality 10" COM-STAR+ H.S. HIGH SPEED 160-180 CPS Business Printer \$369.00

This Super High Speed Com-Star+ Business Printer has all the features of the 10" COM-STAR+ PRINTER with HIGH SPEED BUSINESS PRINTING 160-180 CPS, 100% duty cycle, 8K Buffer, diverse character fonts, special symbols and true decenders, vertical and horizontal tabs. A **RED HOT BUSINESS PRINTER** at an unbelievable low price (Serial or Centronics Parallel Interface) List \$699.00 **Sale \$369.00.**

Superior Quality 15½" COM-STAR PLUS+ H.S. High Speed 160 - 180 CPS Business Printer \$469.00

This Super High Speed COM-STAR+ 15½" Business Printer has all the features of the 10" COM-STAR BUSINESS PRINTER with 15½" Carriage and more powerful electronic components to handle larger ledger business forms! Exclusive bottom feed. (Serial Centronics Parallel Interface) List \$799.00 **Sale \$469.00**

Olympia

**Executive Letter Quality
DAISY WHEEL PRINTER \$379.00**
This is the worlds finest daisy wheel printer **Fantastic Letter Quality**, up to 20 CPS bidirectional, will handle 14.4" forms width! Has a 256 character print buffer, special print enhancements, built in tractor-feed (Centronics Parallel and RS232C Interface) List \$699 **SALE \$379.**

• 15 Day Free Trial - 1 Year Immediate Replacement Warranty

PARALLEL INTERFACES

For VIC-20 and COM-64 — \$49.00 For Apple computers — \$79.00 Atari 850 Interface — \$79.00 For ALL IBM Computers — \$89.00

Add \$14.50 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$29.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. **WE DO NOT EXPORT TO OTHER COUNTRIES.**

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!
VISA—MASTER CARD—We Ship C.O.D. to U.S. Addresses Only

PROTECTO ENTERPRIZES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

COM-STAR PLUS+
Print Example:

**ABCDEFGHIJKLMN OPQRSTUVWXYZ
ABCDEFGHIJKLMN OPQRSTUVWXYZ 1234567890**

COMMODORE-64 or VIC-20
VOICE SYNTHESIZER

NEW

NEW

**MAKE YOUR
COMPUTER TALK**

VOTRAX BASED
HARDWARE

SALE

ONLY

\$59⁰⁰

You can program any words or sentences • Adjust volume and pitch • Make adventure games that talk • Real sound action games • Make customized talkies • (Demo disk or tape included) • Requires Speaker

You can add **TEXT TO SPEECH SOFTWARE** that allows you to simply type what you want to hear!! Also allows you to add sound and voice to **SCOTT ADAMS AARD-VARK** and **"ZORK" ADVENTURE GAMES** List \$29.95 Sale \$19.95 (Disk or Tape).

• LOWEST PRICES • 15 DAY FREE TRIAL • 90 DAY FREE REPLACEMENT WARRANTY
• BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

COMMODORE 64
80 COLUMN BOARD
FOR ONLY **\$99⁰⁰**

SALE

Now you can program 80 columns on the screen at one time! Converts your Commodore 64 to 80 columns when you plug in the PROTECTO 80 Expansion Board. List \$199.00. Sale \$99.00.



Includes 4 Slot Expander and can be used with most existing software!!!

Add \$3.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO.

WE LOVE OUR CUSTOMERS

**PROTECTO
ENTERPRIZES** (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

COMMODORE 64

Computer Learning Pad

Coupon **39⁹⁵**

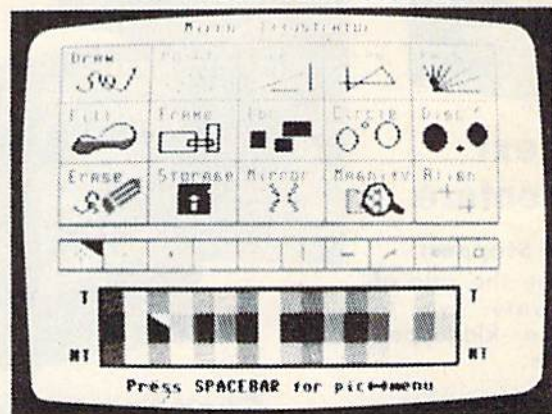
List \$79.95

Sale \$49.95

- Makes graphic tablets Obsolete
- Includes Special Printer Feature.

Now you get this **Fantastic Tech Sketch Computer Learning Pad Program** with a **Professional Light Pen Free!** (39.95 value) plus the **Micro Illustrated Graphics Pad Program** that allows you to draw on your T.V. or monitor screen (better than Gibsons \$99 light pen). Whatever you can draw on the screen you can print on your printer (a Tech Sketch Exclusive.)

Hi-Resolution!
NEW FROM TECH SKETCH



JOIN THE "NEW BREED" OF VIDEO ARTISTS!

Commodore 64 & VIC-20

\$24.95 Professional Model \$24.95
Light Pens

Professional Light Pen. This is the TECH SKETCH Hi-Resolution model that allows you to draw fantastic pictures and professional diagrams — single-pixel accuracy! (Includes famous paint and sketch program.)
List \$39.95. Sale \$24.95. Coupon \$22.95

\$24.95

Economy Model with 3 programs \$16.95

Add \$3.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders. 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO.

PROTECTO
ENTERPRIZES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

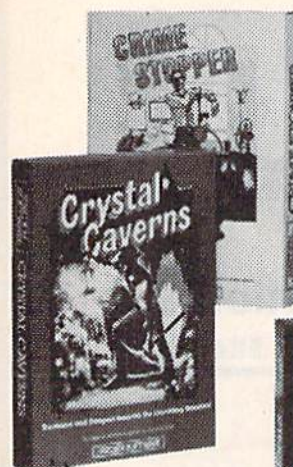
Hayden's Computer Software Price Breakthrough

Commodore 64

Your Choice

\$9.95

Originally \$24.95 to \$34.95



Text Adventure

Crime Stopper:

Assume the role of a private eye to save a kidnapped heiress.

Crystal Caverns:

Find hidden buried treasures under an old mansion.



Strategy Games

Final Conflict:

Program robots to destroy the enemy's base. Battlefield variations game can be played against computer or opponent.

King Cribbage:

Graphic version of the classic card game. Hi-res graphic representation of playing cards and cribbage board.

Reversal:

Winner of the national "Othello" tournament.



Championship Golf:

Select club, strike, direction; a must for every golfer.



Education

MicroAddition

MicroSubtraction

MicroMultiplication

MicroDivision

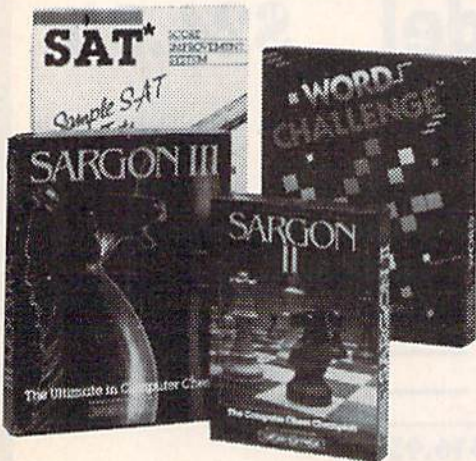
Color animation and cheerful tunes make learning arithmetic fun.

Match-Up:

3 matching games for pre-school that use colorful objects that teach the principles of "same," "related," and "different."

Don't Shoot That Word:

Your beginning readers will become skilled at word recognition with this fun game.



Other Great Values From Hayden

Sargon II:

The best selling microcomputer chess game in the world. A classic game with seven levels of play.

was \$34.95
now **\$17.95**

Word Challenge:

An engaging word game like Boggle, 90,000 word lexicon, dozens of game variations.

was \$39.95
now **\$29.95**

SAT Sample Tests:

It includes a diagnostic Pre-test for determining strengths and weaknesses in the mathematical and verbal section of the SAT. Offers test-taking strategies and two timed simulated SAT exams scored on the "800" scale.

was \$34.95
now **\$17.95**

Add \$3.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO.

**PROTECTO
ENTERPRISES** (WE LOVE OUR CUSTOMERS)

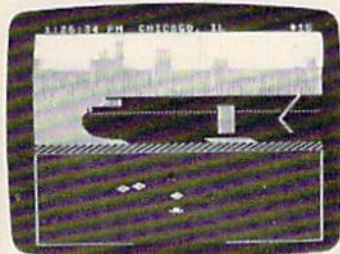
BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

Scholastic Software

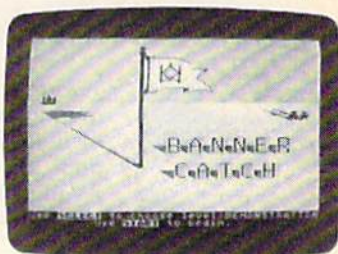
Commodore 64

Super School Savings

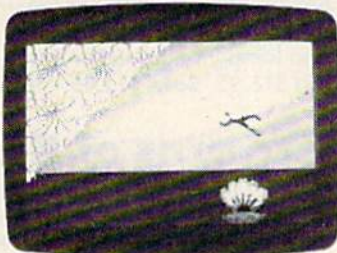
0800 Agent U.S.A. Agent USA challenges the player to intercept the Fuzzbomb by travelling across the U.S.A. You must use your knowledge of time zones, state capitals, geography, map reading, and route planning to achieve your goal. Fantastic adventure game with full color graphics and excellent sound. (Disk.) List \$34.95. **Sale \$24.95.**



0804 Banner Catch. This one even teaches Binary numbers. Players must work together as a team in this capture the flag game where you must get Max's flag before his robot raiders get yours. Fantastic play action and teamwork and cooperation skills make this a must for everyone. (Disk.) List \$34.95. **Sale \$24.95.**



0808 Spell Diver. Sharpen spelling skills, improve reading, word recognition and retention. The player is a diver who must explore the ocean floor to find and uncover letters. The more quickly a player can guess a word the more points are scored. Sea creatures and other dangerous surprises plus a time limit make it more exciting. Fantastic graphics and sound. (Disk.) List \$34.95. **Sale \$24.95.**



0812 Double Feature Adventure. Two full color graphic adventures that allow the player to choose among danger, humor, excitement and chance. Plus these programs make the players stars of the adventure. Explore the microzone or the Northwoods while improving reading skills and building vocabulary. (Disk.) List \$29.95. **Sale \$17.95.**



0816 Tales Of Mystery. Two more famous twist-a-plot adventures that challenge the player first, to find a friend lost in a haunted house. Second, to find a statue stolen from an island. Fantastic graphic adventures. (Disk.) List \$29.95. **Sale \$17.95.**



0820 Square Pairs. Sharpen and improve your vocabulary, reading, and spelling skills while improving deduction and memory. You must match characters in the ready to play games then you can create your own. (1 to 4 players.) (Disk.) List \$29.95. **Sale \$17.95.**



Add \$3.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO.

PROTECTO ENTERPRIZES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

Commodore 64

NEW!

\$12⁹⁵

AND UP

ARCADE ACTION
VIDEO GAMES

Cassette \$12⁹⁵

Diskette \$16⁹⁵

GAMES WORTH PLAYING COSMI

Text Pro/Data Pro

Two hot selling home/office management systems in one package. Includes both a powerful word processor and a database storage program. Available in both cassette and disk. List \$34.95. **Sale \$24.95.**



Monster Trivia

A hot new concept for home and computer buffs. Over 2000 trivia questions in six categories for one to four players. With exciting high resolution graphics, colors and sounds. Available in both cassette and disk. List \$24.95. **Sale \$16.95.**



Forbidden Forrest.

Only your skill as an archer can protect you! Giant spiders, enormous bumblebees, huge leaping frogs, a phantom protected by killer skeletons, and even a fire breathing dragon try to stop you. All in stunning 3-D graphics. You'll feel like you're part of this one. Fantastic all the way around. (Tape.) List \$16.95. **Sale \$12.95.** (Disk.) List \$21.95. **Sale \$16.95.**



Professor I.Q.

This educational game is designed in an exciting, fun filled format, automatic handicapping challenge includes Word Scrambles, Math Fun, Puzzle Time, Reverse It and Strategy. Available on cassette and disk for one or two players. (Tape.) List \$16.95. **Sale \$12.95.** (Disk.) List \$21.95. **Sale \$16.95.**



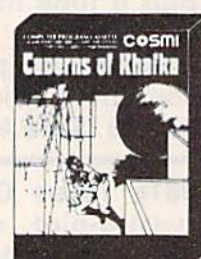
Aztec Challenge.

You are a member of the powerful Aztec tribe. To avoid sacrificing yourself to the gods, you must compete in and complete the deadly AZTEC-OBSTACLE-COURSE. Seven phases with increasing levels of difficulty make this course challenging and keep you going for hours. List \$16.95. **Sale \$12.95.** (Tape or Disk).



Caverns of Khafka.

Unbelievable adventure game. Here's just a few of the many obstacles: Boulder of Isis, Mazes of Khafka, Keys of the Chambers, acid pools, falling boulders, ladders, jumping ropes, moving walls and platforms and a whole lot more. Fantastic graphics and sound make this a must for everyone. (Tape.) List \$16.95. **Sale \$12.95.** (Disk.) List \$21.95. **Sale \$16.95.**



Add \$3.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO.

PROTECTO ENTERPRISES

(WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

* Buy 1 (at Sale Price!) Get One **FREE**
Commodore 64

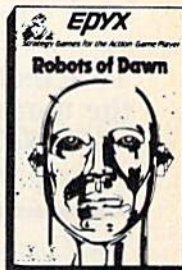
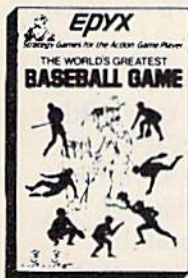
(Expires 12-25-84)

* (Limit: One Per Customer)

The Best Arcade Games Around

World's Greatest Baseball — Finally a great sports game. Realistic right down to the playing field. Control all the actions - even the outfielders. Play realistic baseball all year round. (Fantastic graphics, action, and sound!) (Disk) List \$34.95. Sale \$27.95.

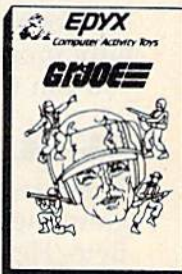
Robots of Dawn — Elijah Baley is here from the best-selling science fiction series by world renowned author Isaac Asimov. Now you can become Earth's most famous detective in this exciting test-adventure. Question the inhabitants of far flung cultures — who's lying, who's telling the truth, and who is trying to murder you? Jump into the action in this fascinating epic murder mystery. Can you piece together the elusive clues to solve the eternal question "who done it?" (Disk) List \$39.95. Sale \$27.95.



PROTECTO EXCLUSIVE

Barbie — The biggest name in dolls. Browse through Barbie's closet full of beautiful clothing and dress her for the party. You can cut her hair or make it longer and color it or change the style. Buy new clothing at the boutique or any of the six other specialty shops, or even go to the dress shop and create Barbie's designer clothes with the help of the computer. The combinations are endless and so is the fun. One or two players. (Disk) List \$39.95. Sale \$27.95.

G.I. Joe — The best selling toy soldier is now available as an activity toy on the home computer. Select the battle situation then choose the equipment you think you will need to get the job done. Choose from a number of uniforms and weapons in your well stocked arsenal and get ready for the action. Play alone or with a friend, if you plan the right strategy you will complete the mission if not you will have to try again. One or two players. (Disk) List \$39.95. Sale \$27.95.



PROTECTO EXCLUSIVE

Hot Wheels — Now all the action and fun from playing with Hot Wheels cars is taken one step further on the home computer. Hot Wheels lets you choose your play activity from repairing cars to the destruction derby. You can actually play the activities along with a partner on the computer screen, even build and customize your own cars. A whole new way to play Hot Wheels. One or two players. (Disk) List \$39.95. Sale \$27.95.

Break Dance — Break Dance is an action game in which your dancer tries to break through a gang of break dancers descending on him. "A simon-like game" where your dancer has to keep the steps of the computer controlled dancer, and even a free dance segment where you develop your own dance routines and the computer plays them back for you to watch. Now anyone can break dance!! (Disk) List \$39.95 Sale \$27.95.



* Buy Epyx games from Protecto and choose Silicon Warrior, Lunar Outpost, or Upper Reaches of Aphai FREE! (\$39.95 value)

In case of stock outage we will substitute.

Add \$3.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO

PROTECTO ENTERPRISES WE LOVE OUR CUSTOMERS!

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

Key Memory Locations

This month we'll take a look at some of the more useful memory locations in the VIC. We'll see how to use them, and offer some programming hints.

The *Commodore VIC-20 Programmer's Reference Guide* lists over three pages of useful memory locations. Unfortunately, little is mentioned about how the VIC uses these locations or how you can use them in your programs.

Let's take a look at some of these memory locations, explore their uses, and work out some nifty programming techniques and subroutines you can use in your programs.

43-44 (\$2B-\$2C): Start of BASIC

These two bytes point to the start of BASIC program memory. The address is stored in the Low Byte/High Byte (LBHB) format (see accompanying article). By POKEing values here, you can move the start of the BASIC program storage area to a different location in RAM.

Under normal circumstances, there's no need to move the start of BASIC. The VIC and 64 have an automatic relocation feature that loads a program at the current start of BASIC storage area even though it may have been saved from another location.

For example, a BASIC program may have been saved from an unexpanded VIC where the start of BASIC is normally 4096. When you plug an 8K or larger memory expander into the VIC, the start of BASIC moves to 4608. If the program that was saved on the unexpanded VIC is loaded back into an expanded VIC using the LOAD "filename", device number format (where device number is 1 for tape and 8 for disk), it loads at the start of the BASIC program area, even though BASIC storage starts at a different location.

LOAD "filename", device number is a relocatable load—it loads a program at the start

of BASIC wherever that may be. (The only exception is if the program was put on tape with a non-relocatable save, SAVE "filename", 1, 1; there is no comparable non-relocatable save for disk.) The LOAD "filename", device number, 1 (we've added a ,1) format is a non-relocatable load, and loads the program into the same memory locations from where it was saved. Non-relocatable loads are used primarily for machine language (ML) programs.

Under certain circumstances, though, moving the start of BASIC is necessary. Using custom characters on a VIC with 8K or more memory expansion is one such case. Because the VIC chip, which reads the character generator, cannot "see" into expansion RAM, you cannot place your custom characters at the top of BASIC RAM as you might do with the unexpanded VIC. The custom characters have to go somewhere between 4096 and 8192 (and you don't want them smack dab in the middle of BASIC).

In this case, you need to move the start of BASIC up so that you can load the custom characters into an area of RAM the VIC chip can access. Moving the BASIC storage area to begin at location 5632 instead of 4608 provides 512 bytes starting at 5120 for the custom characters. To do this, POKE 44,22:POKE 5632,0:NEW. Each time you increase the value in memory location 44 by 1, you move the start of the BASIC program area up one page, or 256 bytes. Each time you increase the value in location 43, you move the start of BASIC program area up one byte.

When you move the BASIC program storage area, it's best to do it without a BASIC program in memory. Otherwise you're likely to lose all or part of the program.

If you're combining machine language with your BASIC programs, moving BASIC up will provide you with a safe area to put your ML subroutines. You can POKE the ML into the protected area below BASIC.

Here's a short program that will move the start of BASIC storage up one to ten pages (256-2560 bytes). Type it in, save it, then run it. When prompted, enter how many pages you want to move BASIC up (1-10). Using the dynamic keyboard technique, the program moves BASIC, enters NEW, and leaves your VIC ready to load or enter a program.

```
10 PRINT "{CLR}MOVE BASIC UP HOW MANY PAGES
? (1-10)"
20 INPUT PG
30 IF PG < 1 OR PG > 10 THEN 10
40 N = PEEK(44) + PG
50 PRINT "{CLR}POKE44, "; N : POKE(256 * "; N" + P
EEK(43)) - 1, 0 : NEW"
60 POKE631, 19 : POKE632, 13 : POKE198, 2
```

45-46 (\$2D-\$2E): End of BASIC program/start of non-array variables

These memory locations point to one byte past the end of the BASIC program currently in memory.

As a BASIC program runs, the operating system builds variables (but not array variables), starting here and upwards into memory. This pointer (as well as memory locations 174 and 175) can also be useful in finding the end of your BASIC program.

55-56 (\$37-\$38): End of free RAM

This pointer is much like memory locations 43 and 44 except that it signals the top of free RAM, or the end of available user BASIC memory.

If you think of memory as a football field, locations 43 and 44 point to the beginning of memory (your own goal line) and 55 and 56 point to the end of memory (the other goal line). BASIC programs begin at the beginning of memory and variables are stacked on top of the BASIC program, which is why you lose variable values when you add, delete, or change a BASIC line. Arrays are put on top of the other variables. Dynamic strings, on the other hand, begin at the top of memory (the opposite goal line) and extend downward in memory. (Dynamic strings are those that require evaluation, like A\$ in A\$ = A\$ + B\$, or A\$ = CHR\$(65), or INPUT A\$.) Whatever is left between the end of arrays and the beginning of strings is free memory. When the pointer to the end of arrays meets the pointer to the beginning of strings, you get an OUT OF MEMORY error.

By POKEing lower values into locations 55 and 56, you can lower the top of RAM, thus providing a safe place to store your custom characters (in the unexpanded VIC) or machine language routines. Each time you decrease the value in location 56 by one, the top of memory

moves down one page (256 bytes). Decreasing the value in location 55 moves the top of memory down one byte. The memory is still there, you've simply fooled BASIC into thinking it's not available for string variables. If you plan to lower the top of memory, you should do it *before* defining any strings, or you may lose them.

For example, if you turn your unexpanded VIC off then on again and enter: PRINT PEEK(55) + 256 * PEEK(56) you should get 7680 which is the end of user BASIC memory. Now if you enter POKE 56, (PEEK(56) - 1): CLR (CLR erases variables and is necessary whenever you change the top of memory pointer) then re-enter the above line, you'll get a value of 7424. By decrementing the value of location 56 by one, we've moved the top of RAM to 7424. The 256 bytes between 7424 and 7680 are now a safe place to put your ML program or custom characters.

Here's a program that will move the top of BASIC RAM down from one to ten pages. When prompted, enter 1 to 10 then press RETURN. The program will automatically move BASIC down and leave your VIC ready to use.

```
10 PRINT "{CLR}MOVE BASIC DOWN HOW
[3 SPACES]MANY PAGES (1-10)?"
20 INPUT N : IF N < 1 OR N > 10 THEN 10
30 POKE56, (PEEK(56) - N) : CLR
```

67-68 (\$43-\$44): INPUT, GET, and READ information source pointer

These two bytes point to the source of information being input into the computer when using the BASIC INPUT, GET, or READ commands. In the case of INPUT and GET, they point to the *BASIC input buffer*. When using READ, they point to the memory location of the DATA statement.

The *BASIC input buffer* is an area of memory that runs from memory locations 512 to 600. This is 89 characters in length, and corresponds to the 88 character BASIC lines or the 88 characters allowed when using the INPUT command (the extra byte is used as a marker for the end of input). When you use an INPUT statement in your BASIC program, the information is temporarily stored in this buffer until a carriage return is encountered. This pointer will point one byte past the last character entered in the input buffer. As an example, enter the following program:

```
10 PRINT "{CLR}ENTER CHARACTER(S) ": INPUT CH
$
20 PRINT "{DOWN}BUFFER POINTER=" : PEEK(67) +
256 * PEEK(68)
```

Run the program and when prompted by the INPUT statement, enter A then press RETURN. As

How The VIC Stores Numbers

Many of the pointers discussed in this month's VICreations are pairs of bytes that store numbers in the Low Byte/High Byte (LBHB) format. Many microcomputers use this format to store large numbers.

Because a single byte can hold a number no larger than 255, two bytes are needed to store numbers 256 or greater. The LBHB method can store numbers from 0 to 65535. Numbers are broken down and stored in memory with the *least significant byte* (LSB) first, and the *most significant byte* (MSB) last.

The MSB is derived by dividing the number you wish to store by 256, then storing the integer value in the MSB. The remainder of the division is then stored in the LSB. Use the following formula to read LBHB numbers in memory:

$$\text{NUMBER} = \text{LSB} + (256 * \text{MSB})$$

As an example, let's use memory locations 43 and 44, which point to the start of BASIC program storage. Using the above formula, we can find the start of BASIC by entering:

```
PRINT PEEK(43)+(256*PEEK(44))
```

The result should be 4097 if you have an unexpanded VIC, 4609 with 8K or more expansion.

Storing LBHB Numbers

Let's say you wish to move the start of BASIC to memory location 7000. To do this, you have to POKE the proper values into memory locations 43 and 44 using the LBHB format. Here's how it's done:

First, divide 7000 by 256 (which gives you 27 with a remainder of 88), then POKE the integer result, the MSB, into memory location 44.

$$7000 / 256 = \text{integer } 27, \text{ so POKE } 44, 27$$

Next, store the remainder of this division into the LSB, which is memory location 43.

$$7000 - (256*27) = 88, \text{ so POKE } 43, 88$$

Now we've POKEd a value of 88 into memory location 43, and a 27 into location 44. If we use the formula to read the values in LBHB format, we get:

$$\begin{aligned} \text{Beginning of BASIC} &= \text{PEEK}(43) + \\ &(256*\text{PEEK}(44)) \\ \text{or } 7000 &= 88 + (256*27) \end{aligned}$$

To actually change the beginning of BASIC requires more than just POKEing new numbers into this pointer. The byte right before the first byte of BASIC has to contain a zero, so you'd have to POKE 6999,0 and then type NEW (to reset some pointers used by variables).

Reading And Storing

To automatically read or store numbers using the LBHB format, use these two formulas:

To read an LBHB number, where N is the number:

$$N = \text{BYTE1} + (256 * \text{BYTE2})$$

To store an LBHB number, where N is the number to be stored:

$$\text{HB} = \text{INT}(N/256); \text{POKE } \text{BYTE1}, N - (\text{HB}*256); \text{POKE } \text{BYTE2}, \text{HB}$$

you can see, the pointer value here is 513. The character code for the letter A was placed in the first byte of the input buffer (512), and the pointer was then incremented one byte past it. Run the program again, but this time when prompted, enter: ABCDEFGHIJ then press RETURN. The pointer is now indicating 522, one byte past the 10 characters entered.

When using the READ statement, the pointer works in much the same way, except that it points either to the zero byte at the end of each DATA statement or to the commas between DATA items. The operating system uses a zero to indicate the end of a BASIC line. Enter and run

this example program after turning your unexpanded VIC off then on:

```
5 PRINT "{CLR}"
10 READ A$
20 IFA$ <> "END DATA" THEN PRINT A$; GOTO 10
30 PRINT "{DOWN} LAST DATA="; PEEK(67)+256*PEEK(68)
50 DATA FRED
60 DATA GEORGE
70 DATA END DATA
```

The value displayed by the pointer here is 4215. This is one byte past the last character in DATA statement 70.

These pointers can be useful in monitoring input into the system, whether it's via the key-

board or a READ statement.

For instance, you might have an application where you want the user to enter a number 10 digits or less. It would be easiest to monitor the size of the number using string commands. For example, enter:

```
A=123
```

Then enter:

```
PRINT LEN(STR$(A))-1
```

As you can see, by first converting the variable A to a string (STR\$(A)), then determining the length of the string minus one (because negative numbers are preceded by a minus sign, positive numbers by a space) will correctly give us a 3.

However, numbers containing 10 or more digits present a problem because the VIC automatically converts these numbers into scientific exponentiation form. As an example enter:

```
A=1234567890:PRINTA
```

The result here is 1.23456789E+09 (meaning 1.23456789 times ten to the ninth power). This won't do us much good because if we try to use the above string/length conversion command on this number, we'll get a value of 14. The operating system treats the decimal point and the "E" denoting exponentiation as part of the string. For example, enter:

```
PRINT LEN(STR$(A))-1
```

This is where our pointers come into use. By using the INPUT command and the pointers in the program, we can accurately determine the length of input up to 88 characters long. Here's a program which is designed to allow the user to enter a number containing only 1 to 10 digits:

```
10 PRINT "{CLR}ENTER A NUMBER, ":PRINT"LIMI  
T 10 DIGITS, ":PRINT"NO COMMAS."  
20 INPUTA  
30 IFPEEK(67)+256*PEEK(68)>522THENGOTO10  
40 PRINTA
```

When prompted to enter a number, enter 1234567890. As indicated, the length here is 10 digits, and the program accepts the input as valid.

Now run the program again, entering 12345678901. In this case, the number was not accepted because it is 11 digits in length. The key to this technique is line 30, which checks to see if the pointers were incremented past memory location 522 (522 minus the beginning of the buffer, 512, = 10 digits), and if so, refuses to accept the data.

139-143 (\$8B-\$8F): Random seed value

These bytes are the root (or "seed") of the BASIC RND command. When the RND com-

mand is used in a BASIC program, these bytes are multiplied, added, and otherwise scrambled in hopes of creating a truly random number. But they have limited use in BASIC programs, where the RND command can be used.

However, when programming in machine language, you can use the random seed to produce a random number without branching back to BASIC. To do this, JSR (Jump to SubRoutine—much like the GOSUB in BASIC) to memory location \$E094 (decimal 57492). This is the beginning of the Kernal subroutine that "spins" the random seed bytes, and produces a random number. After the JSR, you can process any of the five random seed bytes as you wish. Memory location 143 seems to be the most random of the five. (For more information on random numbers and the random seed, refer to "Inside Random Numbers" in the June 1984 issue of COMPUTE!'s GAZETTE.

144 (\$90): Status word (ST)

This byte corresponds to the BASIC reserved variable ST (STATUS). When you open or close channels, or perform input/output operations, this byte indicates the final status of the operation.

As is true with the random seed, it has limited use in BASIC where you can use the ST variable itself. But in machine language, this byte is handy for checking the status of an input/output operation.

An input/output operation will set various bits in this memory location as noted:

Cassette:

- Bit 2 = Short Block
- Bit 3 = Long Block
- Bit 4 = Unrecoverable error (read), mismatch
- Bit 5 = Checksum Error
- Bit 6 = End of File
- Bit 7 = End of Tape

Serial devices:


- Bit 0 = Time Out (Write)
- Bit 1 = Time Out (Read)
- Bit 6 = EOI (End of Input)
- Bit 7 = Device Not Present

Checking location 144 can be very useful when you're reading a file of unknown length from tape or disk: After opening the file, use GET# to get bytes one at a time, followed by the line:

```
IF PEEK(144)=64 THEN CLOSE file number:END
```

or the equivalent:

```
IF ST=64 THEN CLOSE file number:END
```

When bit 6 is set (when location 144 has a value of 64), that means you've reached the end of the file and it's time to close it. 

Time Clock

David W. Martin

Put a digital clock on your computer screen with this machine language program. For the VIC and 64.

There's a clock inside your computer. It starts ticking immediately when you flip the on switch and continues until you turn your VIC or 64 off.

It's called the jiffy clock, a three-byte section of memory that ticks every sixtieth of a second (jiffy). You can read the time in jiffies with `PRINT TI` or find how many seconds it's been since you turned on the computer with `PRINT TI/60`. To get a more readable time, `PRINT TI$` gives you hours, minutes, and seconds (131500, for example, would be 13 hours, 15 minutes, 0 seconds, or a quarter past one in the afternoon).

`TI` and `TI$` are called reserved variables. They are reserved for timekeeping only; you can't use them in your programs, unless it's for checking the time. To set the clock, you can define `TI$`, using the HHMMSS (Hours, Minutes, Seconds) format inside quotation marks. Enter `TI$="063000"` to set the clock to 6:30 a.m., for example. You can't set `TI` directly; you have to set `TI$`, which affects both time variables.

The Stopwatch Function

The jiffy clock sometimes comes in handy. When you're running benchmark tests, you can set the clock to 000000 just before running the routine being checked. When it's done, `PRINT TI` to see how much time the program took to run. In this way, you find the fastest ways of doing things like alphabetizing. It's like using a stopwatch on a programming technique.

The clock can also be used as an alternative

to FOR-NEXT delay loops. Define a variable as `TI+60` (for a one second delay) and keep looping around until `TI` is greater than or equal to the variable.

If you need to keep time in a program like a racing game or a touch typing program, you simply read the jiffy clock.

Commodore 64 owners have two Time Of Day (TOD) clocks, in addition to the jiffy clock. They're built into one of the interface chips. The TOD clocks count in tenths of seconds rather than sixtieths.

A Time Display Window

You could use a one line program to continually display the time, such as:

```
1 PRINT"{CLR/HOME}";TI$:GOTO1
```

except for one problem. To keep the time updated, the program would have to be running all the time, which means you couldn't use the computer for anything else.

"Time Clock" eliminates this problem. It prints the time in the upper righthand corner of the screen, and leaves the computer available for other tasks. A machine language interrupt drives the program. In other words, it runs in the period when the operating system does its housekeeping (like updating the screen).

To use Time Clock, type it in and save it before running. If the internal checksum does not match up, check the DATA statements (and remember to save your corrected version).

Next, you will be asked to set the clock. The VIC version operates in military time (10:00 p.m. should be entered as 22 hours, 00 minutes, 00 seconds). The 64 version uses a 12-hour clock, with a.m. and p.m. Both versions wrap around



Big Value, Small Price!

Why is quality software so expensive?

No wonder people keep asking that question — some of the most popular business packages cost \$50, \$100, \$200, or more!

Well, at DATAMOST we not only asked the same question, we did something about solving the problem of over-priced software. We created KWIK-WARE!™ at only \$19.95 per package.

KWIK-WARE! is an exciting new line of Commodore 64 software that includes KWIK-LOAD!™ and KWIK-WRITE!™, as well as other soon-to-be-released software products.

KWIK-LOAD! is a menu-driven, disk utility program for the Commodore 1541 disk drive that allows you to load programs, save files, and copy disks over three times faster than with normal Commodore DOS! KWIK-LOAD! also lets you test the operating speed of your drive, edit information on disk by track or sector, rename files, delete files, validate and format disks, print out sectors, and

display and print disk directories, FAST! KWIK-LOAD! helps you save time, which is one of the big reasons you bought your Commodore 64.

And it costs only \$19.95!

KWIK-WRITE! is a full-featured word processor for the Commodore 64 with all the text-editing functions of more costly word processors. It includes easy-to-use command menus and help screens, cut and paste, search and replace, print preview, underlining, screen displays up to 132 characters wide, and more.

KWIK-WRITE! supports most popular printers, loads and saves files fast with the help of built-in KWIK-LOAD!, includes a KWIK-REFERENCE! card, and is compatible with other KWIK-WARE! products.

Priced at just \$19.95, KWIK-WRITE! delivers the quality and power of the most popular word processors, at a fraction of the price!

At DATAMOST, we didn't just ask why software is so expensive. We did something about it.



DATAMOST™ INC.

20660 Nordhoff St., Chatsworth, CA 91311 (818) 709-1202

Commodore 64 and 1541 are registered trademarks of Commodore Business Machines, Inc.
KWIK-LOAD!, KWIK-WRITE!, and KWIK-WARE! are registered trademarks of DATAMOST, Inc.

and reset at midnight.


After the clock is set, the time will appear in the upper corner. You can press STOP and type NEW without affecting the clock. RUN/STOP-RESTORE will erase the clock. To regain it, you'll have to SYS828 (VIC version), SYS49171 (64 version).

Both versions run independently from the jiffy clock, so you can use TI and TI\$ as clocks which are separate from the time displayed on the screen.

Because the jiffy clock does not keep correct time when information is being written to or read from the cassette, the 64 version of Time Clock reads a TOD clock, which is not affected by tape.

The 64 version counts in tenths of seconds, the VIC version in sixtieths. The VIC program also uses the function keys. Press f1 to stop the clock, f3 to start the clock, f5 to clear the clock, and f7 to set the time. With these keys, the program can be used as a computerized stopwatch.

The VIC version is stored in the cassette buffer, so you must avoid cassette operations while running the program. RUN/STOP-RESTORE allows you to save or load from tape, but you'll lose the clock function.

See program listings on page 195. 

1541 DISK DRIVE ALIGNMENT PROGRAM

Finally, a complete disk drive alignment program! No special equipment needed! A two disk (program and calibration) program allows anyone with average mechanical skills to properly align the 1541 disk drive. Complete instruction manual. Don't be fooled by cheap imitations! This is the alignment program that works! See the review in the October issue of the Gazette.

\$44.95 + \$2.50 shipping (U.S.)

PROGRAM PROTECTION MANUAL FOR THE C - 64 2ND EDITION

This is the book you've been waiting for! A complete reference guide to software protection on the C - 64. Covers the disk drive, bad tracks and sectors, modified directories, cartridges to disk and much, much more. Covers both basic and machine language protection schemes. A complete memory map and a disk with many helpful programs is included. Over 100 pages of valuable information. \$29.95 + \$2.50 shipping (U.S.)

PROGRAM PROTECTION NEWSLETTER

A monthly newsletter covering the latest advances in program protection. Each issue will examine 3 to 5 specific programs and their protection schemes. This will be a complete 'HOW' and 'WHY' approach to individual program protection schemes. A full explanation of each protection scheme and special information on the disk drive operating system will be included.

\$35.00 per year post paid in the U.S.

C. S. M. SOFTWARE

P.O. Box 563, Crown Point, IN 46307

(219) 663-4335

VISA AND MASTER CARDS ACCEPTED
DEALER INQUIRIES INVITED

INTERNATIONAL SELF-HELP INSTITUTE

SELF-ANALYSIS PROGRAM

For ages 16 & above

- Only known single score maturity test based on national norms
- Displays individual's stress dynamics and treatment direction
- Analyzes relationships
- Includes life-time progress charts
- Validity — above 99%
- Uses 1 million calculations and over 100,000 data entries
- Useful in homes, hospitals, clinics, professional and business offices

THE INSTITUTE ALSO OFFERS:

- Direct-mail analysis for non-computer owners — requires summary manual
- Matching service — free data entry (personal & business relationships)
- Available for C-64, Atari 800, Apple, PC & Trs-80
- Free maturity score testing (see dealers, C-64 user groups, instructors and demo disks)
- Self-hypnotics tapes based on results
- Area instructors for assistance, if needed

CODE	DESCRIPTION	PRICE	PERS. BUS.
S-A-D	Demo includes free Mat. Scorer	\$ 10	\$ 10
S-A-SM	Summary Manual (only)	7	7
S-A1	Maturity Profile & Reference File	50	150
S-A2	Dynamics and Treatment	50	150
S-A3	Relationship Analysis	50	150
S-A12	S-A1 and S-A2 above	90	280
M-S-A	SELF-ANALYST S-A1, 2 & 3	120	400

Testing Capacity: Personal 250 — Business 1000 times

SEND CHECK OR MONEY ORDER TO: INTERNATIONAL SELF-HELP INSTITUTE

P. O. Box 520950
Salt Lake City, Utah 84152 U.S.A.

WANTED: Area Instructors — Send for Application
Dealer and instructor discounts available

90% REFUNDABLE for 30 days
except on Demo and Summary Manual

Supercharge Your Programming

Add far greater speed and versatility to your C64® or VIC-20® with Micol Systems' extraordinary new macro assembler package - System M2000

Since machine language programs usually run 40-60 times faster than their BASIC counterparts, this inexpensive package is like buying a more powerful computer at a fraction of the cost. A professional system that even the novice will find easy to use, it assembles kilobyte files in seconds and is one of the most powerful macro assemblers available.

But it's more than just an assembler. Your programming will be simplified with such well designed programming tools as a **Text Editor** which has all the handy features allowing you to create your programs easily and a machine language **Monitor**, a sophisticated debugging tool and complete man to machine language interface.

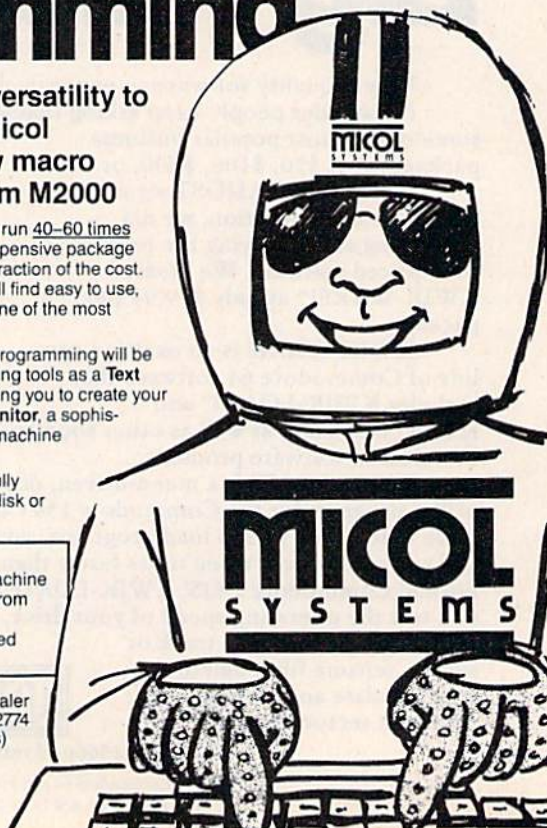
The package is 100% machine code and fully copyable for your convenience. Available on disk or cassette.

Do you already have an Assembler?

If so, you need **MICOL MON**, the Mighty Machine Language Monitor — the super debugger from System M2000, sold separately. Available for C64 and Apple II on Disk. Priced lower than most games.

Available at finer computer outlets. For the dealer nearest you call: **U.S.:** (kapri int'l) 1-800-225-2774 in California: (213) 768-7888 **Canada:** (Access) (416) 736-4402

Micol Systems, 100 Graydon Hall Dr.,
Suite 2301, Don Mills, Ont.
Canada M3A 3A9



Cassette Index

Paul N. Peasley

If you're a tape user, here's a short program that will help you organize each of your tapes by creating a built-in index. For the VIC or 64.

If you're tired of accumulating a lot of small pieces of paper with lists of each tape's files, "Cassette Index" might be a worthwhile alternative. This program offers a built-in index for each side of each cassette—a list of the contents and the approximate locations for each of the programs.

Up To 21 Programs Per Tape

If you've glanced ahead at the program listing, you'll notice that it's very short. However, before you start typing it in, be sure to read the instructions so you can use the program properly. There's a bit of extra work up front, but you'll find the payoff is well worth the effort.

First, turn on your VIC (any expansion) or 64 and type in the program, but pause when you get to the DATA statements (beginning with line 39). These statements will contain the actual names and locations (counter readings) for your programs. Note that the program names and counter readings are entered in pairs, separated by a comma, and that the entries PROGRAM NAME, COUNTER are used in the DATA statements to separate each set of eight pairs. The program allows you to catalog up to 21 programs on one tape.

Continue typing in the program until it's complete. (Include the sample DATA statements as listed.) Next, save it as the first program on a blank cassette, press STOP on the Datassette, and type RUN. If you discover any typing errors, correct them, and again save the program as the first on your tape. (From this point on, we'll refer to this tape with Cassette Index as the *destination* tape, since it will be the tape to which your programs will be saved. The tapes from which we

get the programs we'll call the *source* tape.)

Since you will be copying programs from one tape to another, you might want to stop and think about how you want to organize the new tapes. Perhaps you could put all arcade-type games on one tape, adventure games on another, and programming utilities on yet another. Since it's easier to get to the first program on a tape, you should think about starting with the programs you use most, your favorites. When you have a rough plan, you can proceed.

Next, remove the destination tape (do not rewind it, leave the tape positioned just after the indexer program). Enter NEW, place the source tape in the Datassette, and load a program into memory. At the READY prompt, remove the source tape and insert the destination tape. Reset the counter to 000. Now save the program in memory to the destination tape.

The next step is to write on a sheet of paper the program name and the length (the counter reading after the save is completed). A typical example might look like:

PROGRAM NAME	LENGTH
Ramtest	009

For each program you wish to save on the rest of the source tape, follow the procedures we've just outlined, making sure to reset the tape counter to zero before saving each program on the destination tape.

A Little Redundancy

The remaining steps may seem a bit tedious, but if you've kept a manual log of your tape contents, you've done most of this procedure already. One more bit of repetition, however, will result in automated tape files and more than make up for any extra time spent now.

On your sheet of paper, next to Program Name and Length, enter a new heading to the right called Counter Reading. For the first program listed, enter 000. Then add the length of this first program and enter the result under Counter Reading for the next program. For

example, if the first program was 009 in length, you should enter $000 + 009 = 009$ for the *second* program's counter reading. When you've manually calculated all the counter reading values for each program, you'll notice one value left over at the end without an accompanying program name. This reading is the tape location where the next program will be saved. Assign this blank filename the temporary name of *NEXT PRG*.

When you've saved as many programs as you wish, put the destination tape into the Datasette and rewind it to the beginning. Enter NEW, then load the Cassette Index program. When loading is completed, press STOP on the recorder and LIST Cassette Index to the first DATA statement (line 39). Using the list on your sheet of paper, change DUMMY NAME01 to the name of your first program (insert or delete characters as necessary). Because the first program begins at counter reading 000, this will remain unchanged in the DATA statement as written.

Next, change DUMMY NAME02 to the name of the next program on your list, and change the 000 reading after this name to the correct value as shown on your list. Continue modifying the DATA statements in this manner using the information on your list.


The Payoff

After completing all the DATA statement changes, rewind the destination tape to the beginning and save the newly modified Cassette Index. At the READY prompt, type RUN and follow the directions on your screen. To add more programs to Cassette Index and the tape:

1. Load Cassette Index (destination tape).
2. Reset the program counter to 000.
3. Determine the program name and counter reading for the last program saved on the cassette.
4. FAST FORWARD to that reading, then press STOP on the recorder.
5. Enter VERIFY "program name" and press RETURN. (The computer will read, but not load the program. This technique positions the tape at the next location available for saving a program. Ignore the ?VERIFY ERROR message.)
6. Make a note of this (beginning) counter reading.
7. Remove the destination tape, but *do not rewind it*.
8. Insert the source tape and load the program to be added to the destination tape. Make a note of the program name.
9. When loading is complete, make a note of the final counter reading.
10. Insert the destination tape (with Cassette Index), but *do not rewind it*.
11. Save the program to the destination tape.
12. Rewind the destination tape to the beginning.
13. Enter NEW, then load Cassette Index, already on the tape.
14. LIST the DATA statement containing the program name (step 3).
15. Change the next program name to the name of the program you added to the cassette.
16. Change the counter reading value to the value of the beginning counter reading you noted in step 6.
17. Change the counter reading value for the next (dummy) program to the value of the final counter reading which you noted in step 9.
18. Rewind the tape.
19. Save the newly modified Cassette Index at the beginning of the tape.
20. VERIFY this save.

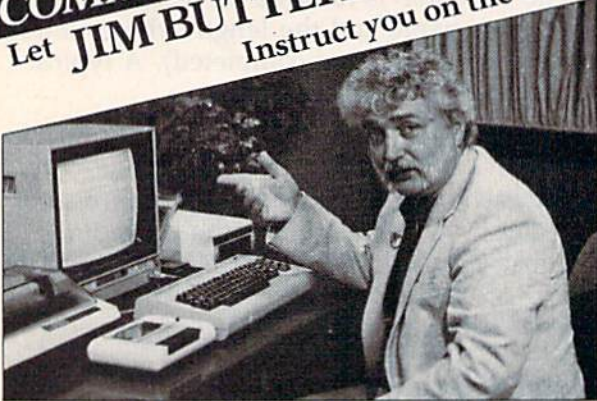
If you'd rather not type in the program, send \$3, a self-addressed, stamped mailer, and a blank tape to:

Paul N. Peasley
1107 Wadsworth Drive
Richmond, VA 23236

See program listing on page 198. 

**NEW for the
COMMODORE 64**

Let **JIM BUTTERFIELD** Associate Editor
Instruct you on the C64 Compute Magazine



14 SESSIONS ON VIDEO TAPE

1) What Is A Commodore 64?	7) Computers Talking to Computers
2) Getting Started	8) Commodore 64 Language
3) Lets Run Programs	9) Graphics
4-A) What Makes Programs Work?	10) Commodore 64 Working For You
4-B) Putting Programs To Work	11) Commodore 64 Music
5) Storing Information	12) Computer Games And Simulations
6) The Commodore 64 <i>As A Learning Tool</i>	13) Now What?

(BETA OR V.H.S.)

Order by phone with VISA or MASTER CHARGE
(209) 255-1600

Send \$39.95 TO: COMM 64 Training Tape
2727 N. Grove Ind. Drive #101
Fresno, California 93727

Add \$3 for shipping and handling.
California residents add 6% sales tax.

Cash, Credit Card, Check, Money Order or C.O.D.
A production of P.F. Communications, Inc.

SMART PERIPHERALS FOR THE COMMODORE 64*!

WHEN IT COMES TO BOOKS, WE'VE GOT YOU COVERED!

You probably already know about our two best-selling books, *Kids and the Commodore 64* and *The Elementary Commodore 64*. Both have been on top of the charts for a year, receiving rave reviews in the process. But do you know that we have other great Commodore 64 books? Books that teach and inspire. Books that cover almost any application you can think of, to help you and your Commodore come to a better understanding. No matter what age you are. Or what level you're at. Whatever computer questions you have, Datamost has the answers!

GAMES COMMODORES PLAY (C-64)

A collection of classic computer games. Simply type them in and make modifications. Learn BASIC the fun way! \$14.95

THE COMMODORE 64 HOME COMPANION

This is the book that SHOULD HAVE come with your Commodore 64. Straight answers to home computing questions, dozens of software reviews, BASIC and more! \$19.95

INSIDE COMMODORE DOS

The inside story on how Commodore's 1541* disk drive works. Complete information on formatting, storage, backing up "protected" disks and recovering damaged data. \$19.95

THE INTERMEDIATE COMMODORE 64

The intermediate step between elementary BASIC and machine languages. Learn about structured programming, flow charts, algorithms, text files and enhanced graphics. \$14.95

THE SUPER COMPUTER SNOOPER (C-64)

Learn how a computer "thinks." Investigate memory, screen, programs and variables, keyboards, printers and expansion boards. For the BASIC programmer who wants to move on. \$14.95

COMMODORE 64 GAME CONSTRUCTION TOOL KIT

Write your own BASIC games! Game tools, techniques, graphics, sound, sprites and fundamental lessons of quality game programming are all included. \$14.95

COMMODORE 64 LOGO WORKBOOK

Teaches grades 2-6 how the LOGO programming language can be used for problem solving. Learn about the "turtle," variables, geometry and recursion. \$12.95



KIDS AND THE COMMODORE 64

For kids of ALL ages. An easy-to-understand book designed to make learning BASIC a fun and exciting experience. Guidance, explanations, exercises, study-guides, reviews and quizzes in a workbook format. \$19.95

THE ELEMENTARY COMMODORE 64

Explains the Commodore 64 in simple, everyday language. How to hook it up, use the keyboard and program in BASIC. Teaches about word processing, utilizes and peripherals. \$14.95



DATAMOST™
INC.

20660 Nordhoff St., Chatsworth, CA 91311, (818) 709-1202

*Commodore 64 and 1541 are trademarks of Commodore Business Machines, Inc.

Disk/Tape Backup

N. A. Marshall

If you have a Datassette and disk drive, this program can provide extra security by doing an automatic backup of files from disk to tape or vice versa. For the VIC (with 8K or more expansion) and 64.

Most all computer owners have at least once become exasperated with a lost program or one that refuses to load. "I should have backed it up" is a common refrain. It can be a frustrating experience. "Disk/Tape Backup" is a security utility for those with tape and disk drives. It's a two-phase—backup and restore—program that handles sequential and program files. The backup phase, or process, is for disk to tape; the restore phase is for tape to disk.

At the start of the backup process, the program saves itself as the first program on the tape. This ensures that there is a copy for restoring files later. During backup, the program dates the disk in a file called SYS DATE. It also writes the time and date and a directory of all files to be processed onto the tape.

Selecting Disk Files

Before dating the disk, the program asks if all files are to be processed, and the tape size in minutes. It uses the tape size information in deciding when to call for another cassette.

If all files are to be processed, the program reads the directory, lists it, and puts it into a table. If only selected files are to be processed, the program reads the directory, displays each filename and asks if it is to be processed. The files you selected are then put in the table. When the directory is finished, the table is sorted and the backup commences. This process can take a couple of hours because of the speed of the tape drive.

Program Variables

BH	Number of bytes that tape file header uses (300)
BD	Number of bytes per disk block (256)
BK	Block number
BM	Number of bytes per half minute of tape (840)
BO	Border address (53280)
DA	Dash
DIR	Directory file number (8)
FP	Disk file file number (5)
K0	Constant 0
K1	Constant 1
K2	Constant 2
K3	Constant 3
K4	Constant 4
LN()	Number of blocks in each file
NB	Number of bytes written
NC	Tape record size
NE	Number of equal characters
NF	Number of files
PS	Size of DTB in bytes (approx. 8000)
SP	Space (32)
TB	Tape size in bytes
TM	Tape size in minutes
AF\$	All switch
AN\$	Normal/abnormal switch
BR\$	Backup/restore switch
CO\$	CHR\$(0)
CO\$	Comma
DA\$	Date
DN\$	Disk name
FM\$	Name in bring down procedure
NA\$()	Names of files to be processed
RC\$	Record code
SP\$	Spaces
TS()	Types of files
TY\$()	File types for files to be processed
VN\$	Version (2)

During the backup, typing a P when prompted causes the program to stop and ask if you wish to quit. Press Q to close all files and end the run.

The Restore Phase

The second phase, restoring, is similar in operation to the backup phase. The process is similar,

EM

COMPUTER TV!! **NEW!**

MTR
8401
Color TV
Tuner



- Receive UHF/VHF TV channels on any standard, composite monitor.
- Switch between computer and TV.
- Audio "mute" control
- Switchable AFT
- LED "on" indicator

\$85.85

MTR
PM-4401C
Data Cassette
Recorder



- Compatible with VIC-20 and Commodore 64
- Tape Counter • Auto Stop
- "Save" LED indicator
- Pre-Set Playback Level
- Complete with 4 1/2 ft. cable. Ready to connect

\$39.95

MTR
EV-2114
Composite Color
Monitor



- Green Screen Switchable
- Compatible with Commodore • Apple • Atan • TI
- 6 Front Mounted Controls for Easy Adjustment
- Built-in Speaker
- 14" x 13" x 15"

\$229.95

MTR EV-2131N Amber
Monochrome, 80 Column, 12"
While they last: **\$89.95**

COMPARE OUR LOW PRICES ON QUALITY CABLES AND DUST COVERS!

6' PRINTER/DISK DRIVE CABLE for Commodore VIC20 or C64. Ideal if your space requires a longer cable. 6 Pin D.I.N. to 6 Pin D.I.N. male connectors. **\$9.95**

3' UNIVERSAL MONITOR CABLE 5 Pin D.I.N. to 4 RCA plugs, with 3.5 mm. mini plug adaptor. **\$7.95**

DUST COVER FOR C-64 in brown cloth backed vinyl. Highly anti-static material helps protect unit from spills, scratches, dust and static. **\$3.95**

DISK DRIVE DUST COVER for 1540 or 1541. **\$3.95**

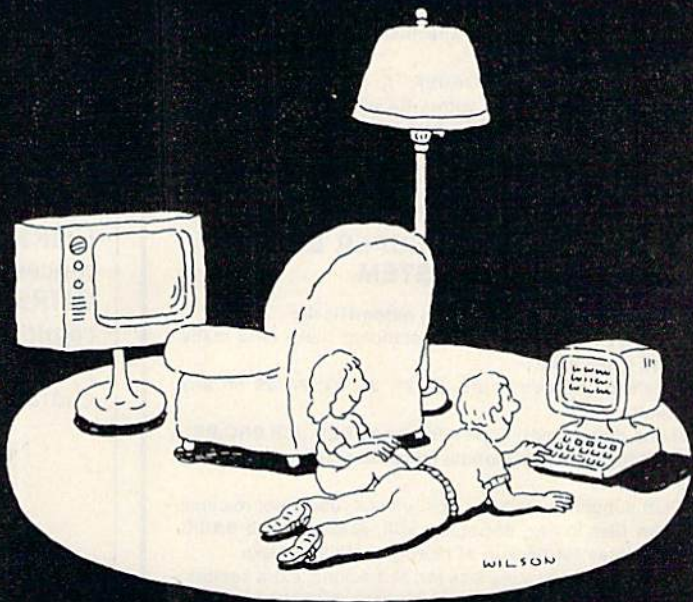
E MART, INC., Dept. "G"
900 "N" Avenue, P.O. Box 454
Plano, Texas 75074

TO ORDER CALL:
1-800-631-1112

IN TEXAS:
1-214-423-4199

OFFICE HOURS: Mon-Fri: 9:00-12 Noon/
1:00-5:00 p.m. Sat: 9:00-1:00 p.m. CST
FOR FAST DELIVERY WE ACCEPT VISA & MASTERCARD, money orders, and cashier checks. Personal and company checks must clear before order is processed. All products are new and sold with manufacturer's warranties. Prices are FOB our warehouse. Please add estimated shipping and insurance. Texas residents add sales tax. Credit card users add 3%. Return shipments must have return authorization number; call (214) 423-4199. Equipment returned for credit is subject to a 15% restocking charge plus shipping cost. Prices subject to change without notice.

EM



Complacency or curiosity?

Move your children away from the passive nature of TV and turn them on to the excitement and fun of interactive learning with Dow Jones News/Retrieval®

You probably thought Dow Jones News/Retrieval only provided business and financial information. *Wrong.* We've got something of value for the whole family.

With our 20-volume, 30,000 article Academic American Encyclopedia, Dow Jones News/Retrieval will pique your children's curiosity about the world and help them develop new skills. The information they need for school is easy to access, always up-to-date, always ready. And kids love to use it!

There are timely news reports

from Washington, our nation and the world. You also get current schedules and rates from the Official Airline Guide;™ Comp-U-Store, a convenient shop-at-home service; Cineman Movie Reviews; sports highlights, weather reports and MCI Mail—the new electronic mail service that lets you send letters to anyone, *anywhere*, even if he or she doesn't own a terminal.

Overall, you'll find a wide variety of high-quality data bases accessible quickly and easily with most personal computers.

To get your children involved, excited and turned on to the fun of learning, turn them on to Dow Jones News/Retrieval.



DOW JONES

NEWS/RETRIEVAL®

Copyright © 1984 Dow Jones & Company, Inc. All Rights Reserved. Dow Jones News/Retrieval® is a registered trademark of Dow Jones & Company, Inc.

FOR FULL DETAILS, CALL 800-345-8500, EXT. 5

Alaska, Hawaii and foreign, call 1-215-789-7008, Ext. 5

LOAD SOFTWARE 5 TIMES FASTER

WITH

NICK'S SWIFT LOADER

"Tired of waiting for your programs to load?"

- Loads most programs **FIVE TIMES FASTER** using the Commodore 1541 disk drive
- **THREE MINUTE BACKUP** of an entire unprotected disk
- Loads individual files in **SECONDS!**
- Loads **games, word processors** and **BASIC** files in **SECONDS!** (*PaperClip, Mirage* and *Word Pro* in less than 20 seconds)
- Full disk **EDITING COMMANDS**, and **SECTOR EDITOR**
- Load programs into any **user specified address**
- **USER RELOCATABLE**
- ACCESS "**NICK'S SWIFT LOADER**" from easy menu-driven commands or directly from within **BASIC** programs
- Fully documented; **\$19.95** (disk)

NICK'S SWIFT COPY

Much more than just "THE BEST COPY PROGRAM" it is a **SUPER DISK UTILITY SYSTEM**

- Copies **almost all** protected disks **automatically**
- **THREE MINUTE** backup of your standard disks (and many protected disks also)
- Copies and/or creates errors **20, 21, 22, 23, 27, 29** on any track/sector
- **15 second disk format**; copies file types **SEQ,USR,PRG,REL**
- Sector editor with drive **monitor / disassembler**; view and edit **sector headers**
- Full DOS support including: lock, unlock, undelete, re-close files; **view files** in hex, decimal, ASCII, **assembly** and **BASIC**
- Parameter files for backup of heavily protected disks
- **DISK ANALYZER** analyzes disk for: 1/2 tracking, extra sectors, bad sectors (**tracks 1-37**) and non-standard SYNC (analyzes for newest protection schemes)
- Supports 1 or 2 1541 disk drives
- Drive head never "**kicks**" or "**chatters**" when copying
- **ABSOLUTELY** no hardware modification required
- All of this and so much more for only **\$34.95** (disk)

NICK'S BASIC

Adds over 128 **POWERFUL COMMANDS** to the C-64 **BASIC** language

"The ultimate BASIC extension" say our users!

Full support for **HI-RES** graphics • Music • **SUPER FAST DOS** • File Handling • Text Control • String Handling • Sprites • Character Graphics • Program Editing • Game Commands • Fully Documented, complete with examples. See our ad in the **NOVEMBER COMPUTE!'S GAZETTE** for a partial description or write for details. All this for only **\$39.95** (disk); cartridge (inquire).

NICK'S TERMINAL 64

Supports Auto Answer/Auto Dial • Upload/Download PRG, USR and SEQ Files • 128 Definable Functions • Alarm Clock • Dump to Printer • Supports all baud, parity and word lengths. **\$29.95** (disk).

NICK'S BASIC UTILITIES

RENUMBER • Find/Replace • Delete • ML Relocator • File Merger • Character Editor • (25 utilities) only **\$17.95** (disk).

DELIVERY: Shipping and handling add \$3.00 per order. For fast delivery use cashier's check or money order. VISA and MASTERCARD add \$2.00. For a complete description of these programs and for our other in house Commodore 64 programs send a stamped, self addressed envelope to:

Computer Division

Southern Oregon Video Enterprises, Inc.


P.O. Box 400 • Ashland, Oregon 97520 • (503) 482-5054

C-64 is a Tm of Commodore Electronics, LTD.; PaperClip is a Tm of Batteries Included; Mirage is a Tm of Mirage Concepts, Inc.; Word Pro 3 plus is a Tm of Professional Software, Inc.

but direction is reversed. It backs up from tape to disk. Be careful, files on disk will be replaced by files of the same name from tape. Before the restore starts, the program offers to reformat the disk, so a brand new unformatted disk will work just fine. Program design is straightforward, and screen instructions and prompts should be clear even to beginners.

The internal clock loses time when writing and reading disk and tape files. A count of characters processed is kept and used in an attempt to reset the clock at the end of processing of each tape. However, this is not totally accurate.

A 90-minute tape can hold up to 140K. Data is packed before it is written to tape. For example, multiple spaces are stored as CHR\$(232)+CHR\$(count), multiple dashes as CHR\$(245)+CHR\$(count), and multiple occurrences of other characters are stored as CHR\$(231)+CHR\$(count)+CHR\$(other), where count is the number of times the character is repeated. CHR\$(230) means skip this but not next character.

See program listing on page 199. 

Bought expensive software lately? Brace yourself.

The Intelligent Software package for C-64™, VIC™, and PET/CBM™. \$35 for everything.

No 3-color ads, no shiny packaging, and [sorry] no games; just fifteen powerful, useful programs that will put your Commodore to work right now, in your home or office; all on one disk at a near-unbelievable price. Includes:

Database: A complete multi-keyed fixed-record-length data base manager. Sort or select (using all relational operators: =, >, <, AND, OR, NOT, wild card) on any field, perform computations on numeric fields. Any operation can be performed on all, or only selected records. All fields completely user-definable. Screen editing for records. Can be used for any number of tasks, including accounts-receivable, mailing lists, inventory control, expense account maintenance, or as an electronic rolodex. Even if you use your Commodore for nothing else, this program alone might justify its expense.

Word Processor: A full-featured menu-driven word processor, including: very fast file commands (including a disk catalog), screen editing, text locating, and full control over margins, spacing, paging, indentation, and justification (all commands imbedded in text). "... well done and highly functional ... provides an excellent alternative to the high priced word processors ... this is an excellent buy. Highly recommended." — *Midnite Software Gazette*. "Provides good basic features." — *Compute's Gazette*.

Copycalc: An electronic spreadsheet. Turns your Commodore into a visible balance sheet; includes screen editing. "Excellent program for budgeting, estimating, or any math-oriented use ... well worth the money. Highly recommended." — *Midnite Software Gazette*.

Also included: **ReportGen** (interfaces W/P with Database to create form letters, invoices, mailing labels, other reports); **Baseball Statistician** (compiles batting statistics for a baseball or softball league of up to 250 players, and generates reports on a player, team, or the entire league, including standings); several W/P utilities, including **Index** (indexes W/P's text files); several Database utilities, including **DBmerge** (facilitates multi-file database applications); also **Checkbook**; **Inventory**; **Paper route**; **Loan Analyst**; **Labeler**; more.

Versions of the package are available for **any and every** Commodore computer having a minimum of 12k RAM; all programs will fully support tape, disk, and printer. Price includes shipping within USA and Canada (enclose \$5 fee for C.O.D.); Calif. residents add 6%. Any two programs on cassette, \$20. This ad is the catalog; you may order documentation for any one program separately for \$2 postpaid (deductible from later order). Available only from:

Intelligent Software
Box 3745-G, San Rafael, CA 94912

Give Yourself A Gift
This Year:
A Subscription To
COMPUTE!'s Gazette.



New Technological Breakthrough!

ULTRABYTE DISK NIBBLER

The Ultimate Bit by Bit Disk Duplicator
For The Commodore 64 and 1541 Disk Drive

**ULTRABYTE DISK NIBBLER COPIES
ALL SOFTWARE EXCEPT ITSELF**

SATISFACTION GUARANTEED

Return for refund within 10 days
if not completely satisfied

\$ 39.95

Introductory Price

plus \$3.00 Shipping and Handling
MASTERCARD, VISA, CHECK, or M.O.,
Foreign Orders or COD Add \$2.00
Calif. Add 6.5% (\$2.60) Sales Tax
BACKUP COPIES \$20.00 PLUS \$3.00 SHIPPING

Based on new proprietary Disk Operating System (DOS) that reads and writes bits on the disk independent of format. This process, called nibbling, treats disk errors, extra sectors, renumbered tracks and other protection schemes exactly the same as ordinary data.

- Simple to use. Just load and run
- Fast. Copies entire disk on single 1541 in 8 minutes
- One easy step. No separate analysis or error production
- Uses revolutionary Track Scan Technology to make an exact replica of the original disk.

Write or Call 24 Hour Order Line

ULTRABYTE (818) 796-0576
P.O. Box 789 La Canada, CA 91011

SOFTWARE AUTHORS PLEASE WRITE

LOADSTAR

**A monthly disk
publication for
Commodore 64**



Available at dealers everywhere!

Issue Number 3 contains:

SMURK

An evil cave dwelling creature guards an immense treasure. The object of the ADVENTURE game is to kill the Smurk and retrieve the treasure before the Smurk kills you.

HEAD-ON

So you think you are a good driver? How long can you avoid a "head-on" collision with a smart car guided by your C-64?

GUESS WHAT?

This program gets smarter every time it is run. Children love this one.

POKER PARLOR

Anyone for five card draw?

TABLES & PEOPLE

One definition of intelligence is the ability to recognize patterns. The object of this game is to discover computer selected patterns.

STRESS TEST

Let Drs. Holmes and Masudu compute your social readjustment factor.

CHECKBOOK BALANCER

This is one of the reasons you bought a computer.

RATE EXCHANGE

Tell your C-64 the most current money exchange rate and it will print a chart for you to take on your trip abroad.

4-MINUTE COPY

Straight from Germany. This utility program will format and copy a disk in four minutes on one drive.

BASE CONVERTER

This program makes number base conversions to base 36. Hackers will want to convert to and from base 16 (HEX).

A GARDENING TOOL

This will add polish to your programs. Help us stamp out boring INPUT prompts.

As if all these programs weren't enough...

This issue of LOADSTAR also contains graphics, music, programming hints & tips, plus subscriber bulletins and reviews.

LOADSTAR comes on a double-sided diskette.

LOADSTAR is a bonanza of unprotected programs.

LEARN - programming techniques

USE - useful programs

ENJOY - games and novelties

SHARE - experiences with other Commodore-64 owners

send to: **LOADSTAR**
P.O. Box 30007
4023 Greenwood Rd.
Shreveport, LA 71130-0007
(318) 868-7247

Enclosed is \$9.95 for
number 3 as shown above.

NAME _____

ADDRESS _____

CITY/STATE _____ ZIP _____

VISA/MASTERCARD# _____ EXP _____

Be part of it.

The 84 Vote

Make your voice heard on November 6th when we choose America's leaders.

The health of our democracy depends on the participation of every man and woman. Yet voting levels have been dropping ever since 1960.

In recognition of this problem and the threat it poses, the American Broadcasting Companies and Harvard University sponsored a symposium entitled "Voting for Democracy." There, former Presidents Jimmy Carter and Gerald Ford met with

leaders from many fields to address several questions:

Why do so many Americans choose not to vote? Can we reverse the trend? How do we begin?

In answer, ABC and its affiliated stations have worked throughout this election year to encourage greater voter participation.

ABC Television, ABC Radio and ABC Publishing have enlisted the support of prominent politicians, entertainers and athletes to join them in this effort.

Betty Ford, Reggie Jackson, Barry Goldwater, David Hartman, Coretta Scott King, Henry Kissinger, Dinah Shore, Harry Belafonte, Edward Kennedy, Joan Lunden, Rafer Johnson, Donna de Varona, Dom DeLuise, George McGovern and many others gave their time and thought to TV, radio and print messages urging all Americans to register and vote.



Now, it depends, as it always did, on you. As we move closer to Election Day, let's all remember: one vote does make a difference.

Leonard H. Goldenson
Chairman of the Board

A handwritten signature in cursive script that reads "Leonard H. Goldenson".



AMERICAN BROADCASTING COMPANIES, INC.

NEWS & PRODUCTS

More 64 Memory

Mosaic Electronics is introducing *Access-M*, a memory expansion system for the Commodore 64 which gives the computer access to 64K or 128K of RAM through bank-switching techniques.

The system is based on Mosaic's "scanning RAM" technology, called *RAMSCAN*, which can access any position in the *Access-M* memory through a memory window at \$C000. Programs and data of any length can be accessed through this 4K window. Or the 4K block can be split into two 2K windows. *RAMSCAN* allows BASIC and machine language programs to be stacked through the normal \$C000 address simultaneously and accessed immediately.

The *RAMSCAN* circuit resides on a custom chip, *MCHIP*, and supports *MDISK*, a RAM disk package. *MDISK* is accessed with normal BASIC commands or Kernal calls, and operates without interfering with other programs.

Access-M is available in versions with 64K or 128K. Future enhancements will include a one-megabyte memory expander with an independent power supply, so data is not lost when the computer is turned off.

Telephone Number Correction

Note: The telephone number published with the News and Products announcement for HyTech in the August issue of *COMPUTE!'s GAZETTE* is not the number for that company or for any private business. The number used is that of an agency of the federal government and was erroneously supplied to *COMPUTE!* Publications.

35 New BASIC Commands For VIC-20

Air Software has announced *Magic BASIC*, a software extension to VIC-20 BASIC which adds 35 new commands.

The program loads into VIC-20s with 10K or more of free memory, and uses about 7K of memory for the high-resolution screen and the machine language routines added to VIC BASIC.

Among the routines are *TRACE* and variable *DUMP*, as well as a set of graphics com-

mands for plotting on a 176 X 160 pixel screen. The graphics commands include *SHAPE*, which allows the use of custom characters or normal VIC characters on the high-resolution screen.

The custom character set can be located anywhere in memory, and can be longer than 255 characters. The program is not copy-protected.

Available on cassette, *Magic BASIC* retails for \$24.95.

Air Software
P.O. Box 1109
Stockbridge, MA 01262
(413) 298-4943

Home Information/Telecommunications System For 64

Chemical Bank has announced that its *PRONTO* home information and banking system is now compatible with the Commodore 64.

The system works on a 64, modem, and *PRONTO* software, allowing subscribers to perform such tasks as bill paying, transferring funds, determining bank balances, tracking a budget, and balancing checkbooks.

In addition, subscribers can

send electronic mail to other PRONTO subscribers, and can access certain information services available through the system, such as economic and business briefs, tax guides, magazine articles, and interest rates.

PRONTO is available for a \$12 per month service charge, which includes the software.

*Chemical Bank
Metropolitan Division
52 Broadway
New York, NY 10004
1-800-782-1100*

New Peripherals For VIC And 64

Maxtron has introduced several new peripherals for the VIC and 64: a printer interface, a dot-matrix printer, a power supply, a cassette drive, and speech synthesizer.

The Maxprint+G printer interface (\$89.95) plugs into the serial port. It translates from serial-Commodore ASCII to Centronics parallel true ASCII. No modifications or extra cables are required.

The Maxprint-80 (\$349) prints bi-directionally at 80 cps, with an 8 x 9 square dot matrix, user-selectable character and graphic styles, and sprocket or friction feed.

The DC-1 cassette drive (\$59.95) includes a built-in counter, SAVE indicator, PAUSE, and AUTO STOP.

The Chatterbox (\$59.95)

speech synthesizer for the VIC-20 is a cartridge which produces recognizable words through a TV/monitor speaker. The power supply retails for \$35.

*Maxtron
1825A Durfee Avenue
South El Monte, CA 91733
(818) 350-5706*

New 64 Terminal Software

Versaterm II, a terminal software program for the Commodore 64, has been announced by Electrosharp.

Data can be downloaded to a 43,000-byte buffer or directly to disk or printer. Downloaded image files and BASIC listings can then be converted into operable programs.

Phone numbers can be stored, recalled, and automatically dialed when used with the 1650 Automodem. If the line is busy, the number can be automatically redialed until a connection is made.

Versaterm II allows the user to store, retrieve, and send up to 25 keywords or phrases with a single keystroke.

The program is available on tape or disk for \$34.95.

*Electrosharp
1981 Sandalwood Drive
Santa Maria, CA 93455
(805) 922-4095*

Speed Reading On The 64

Evelyn Wood Reading Dynamics, a familiar name in the field of reading skills and comprehension, has introduced software to teach those skills on the Commodore 64.

Produced and distributed by Timeworks, Inc., the *Evelyn Wood Dynamic Reader* program includes exercises and comprehension quizzes aimed at improving both reading speed and comprehension.

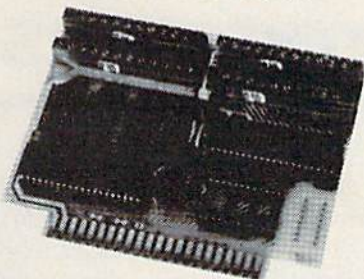
Suggested retail price is \$69.95.

*Timeworks, Inc.
405 Lake Cook Road
Bldg. A
Deerfield, IL 60015
(312) 291-9200*

COMPUTE!'s GAZETTE welcomes announcements of new products for VIC-20 and Commodore 64 computers. Please send press releases, photos, and product samples (if available) well in advance to: Selby Bateman, Features Editor, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403.

New product releases are selected from submissions for reasons of timeliness, uniqueness, available space, and general interest. Readers should be aware that News & Products often contains an edited version of material submitted by vendors. We are unable to vouch for its accuracy at time of publication. ©

NEW!
**Universal Input/Output
 Board for VIC-20/64**



- 16 channel 8-bit A/D converter with 100 microsecond sampling time.
- 1 D/A output.
- 16 high voltage/high current discrete outputs.
- 1 EROM socket.
- Use multiple boards for additional channels up to 6 boards.

VIC-20 uses MW-311V \$205.00
 CBM-64 uses MW-311C \$225.00



Dealer inquiries invited.

Micro World Electronix, Inc.

3333 S. Wadsworth Blvd. #C105,
 Lakewood, CO 80227
 (303) 987-9532 or 987-2671

ULTRACOPY 64

**Disk Duplication System
 for Commodore 64**



\$39⁹⁵

plus \$3
 shipping. Visa or
 Mastercard. Add \$2
 for Foreign or COD

- Simple to use. Menu-driven. Even a beginner makes perfect copies
- Analyze disk tracks for data & errors
- Skip empty tracks to speed copying
- Copy everything incl. DOS flag & false ID
- Put errors 20,21,22,23,27 & 29 on copy as required by latest protection schemes
- Fast, reliable copying with 1 or 2 drives

**98% OF SOFTWARE CAN BE ULTRACOPY'ED
 BEST COPY PROGRAM YOU CAN BUY**

ULTRABYTE Call (818) 796-0576

P.O. Box 789, La Canada, CA 91011

Write or Call - (Note New Address)

Satisfaction guaranteed, 10 day return privilege

Seeking software authors - please write

DIG BYTES

1301 BOARDMAN-POLAND ROAD, POLAND, OHIO 44514

INFORMATION
 & IN OHIO
 ORDER
 LINE

1 (216) 758-0009

1 (800) 638-2617

CALL FOR PRICES ON ALL NEW COMMODORE PRODUCTS

WORD PROCESSING:

WORD PRO 3 + with speller	\$65
PAPER CLIP	59
with speller	79
MIRAGE CONCEPTS	69
EASY SCRIPT	42
EASY SPELL	18

SPREADSHEETS:

CALC RESULT ADV	\$69
CALC RESULT EASY	35
MULTIPLAN	69

DATA BASE MANAGERS:

DELPHI'S ORACLE	89
SUPER BASE 64	69
THE MANAGER	37
CODEWRITER	65
MIRAGE CONCEPTS	69

MODEMS:

HES MODEM	\$47
AUTOMODEM by Westridge	79
COMMODORE 1600	59
COMMODORE 1650	89
COMPUSERVE starter Kit, 5 free hrs	25
MIGHTY MO	CALL FOR PRICES

MONITORS:

SAKATA SC 100	\$229
AMDEK COLOR 1 +	269
BMC 12" Green (new)	85
TAXAN Green/Amber	109-119
COMMODORE 1702	CALL

PRINTERS:

GEMINI 10X/ CARDCO INTERFACE	\$309
GEMINI 15X	389
POWERTYPE 18 cps	
DAISY WHEEL	359
OKIDATA all models	CALL
RITEMAN	269
COMMODORE 1526	269
MPS-801	218
CARDCO + G	67
TYMAC CONNECTION	79

DISK DRIVES:

COMMODORE 1541	CALL
MSD SUPER DRIVE	CALL
CONCORDE	CALL

DATASETTES:

COMMODORE 1530	\$ 63
PHONEMARK	39

ACCESSORIES:

COMCOOL (disk drive fan)	\$ 49
COMCOOL PLUS (with surge protector)	69
COVERS, C-64	5
1541-1525-1526-MPS/801	6
GEM 10-X	8
1702 MONITOR	10
MSD DRIVE	6-7

SPECIALS (While Supply Lasts)

CHALKBOARD \$29
 (With purchase of one software selection at \$15. Leo's Links, Music Maestro, Leo's Paint Brush, Bear Jam, Logic Master, Science Programming Kit.)

INFOCOM:

PLANETFALL \$28

SEGA:

BUCK ROGERS	\$19
CONGO BONGO	19
STAR TREK	19

SIERRA-ON-LINE:

HOMEWORD \$39

STORAGE:

FLIP 'N FILE 25	\$14
DISK FILE 70	16
XIDEX DISKETTES, SS/DD	17

HOURS: MON.-FRI., 10 A.M. to 10 P.M.

• SAT., 10 A.M. to 5 P.M.

MOST ORDERS SHIPPED WITHIN 48 HOURS! All prices include cash discount. VISA/MC orders accepted - add 3.5%. NO COD ORDERS! For quickest delivery send bank check or money order. Personal or Company checks delay order 21 days. All sales are final - defective merchandise exchanged for same product only. Shipping add 3% (\$2.50 minimum). Call for shipping on monitors. Ohio customers add 5.5% sales tax. Prices & availability subject to change. Returns subject to restocking fee. Send \$1.00 for our catalog.

CHECK OUR LOW PRICES
 BECAUSE OF CONSTANTLY CHANGING PRICES
 PLEASE CALL & CHECK OUR CURRENT PRICING

A Beginner's Guide To Typing In Programs

What Is A Program?

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

BASIC Programs

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

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

Braces And Special Characters

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

About DATA Statements

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

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

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

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

Get To Know Your Machine

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

A Quick Review

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

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

How To Type In COMPUTE!'s GAZETTE Programs

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

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

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

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

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

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

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

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

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

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

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

The Automatic Proofreader

"The Automatic Proofreader" will help you type in program listings from COMPUTE!'s Gazette without typing mistakes. It is a short error-checking program that hides itself in memory. When activated, it lets you know immediately after typing a line from a program listing if you have made a mistake. Please read these instructions carefully before typing any programs in COMPUTE!'s Gazette.

Preparing The Proofreader

1. Using the listing below, type in the Proofreader. The same program works on both the VIC-20 and Commodore 64. Be very careful when entering the DATA statements — don't type an l instead of a 1, an O instead of a 0, extra commas, etc.

2. SAVE the Proofreader on tape or disk at least twice before running it for the first time. This is very important because the Proofreader erases this part of itself when you first type RUN.

3. After the Proofreader is SAVED, type RUN. It will check itself for typing errors in the DATA statements and warn you if there's a mistake. Correct any errors and SAVE the corrected version. Keep a copy in a safe place — you'll need it again and again, every time you enter a program from COMPUTE!'s Gazette.

4. When a correct version of the Proofreader is RUN, it activates itself. You are now ready to enter a program listing. If you press RUN/STOP-RESTORE, the Proofreader is disabled. To reactivate it, just type the command SYS 886 and press RETURN.

Using The Proofreader

All VIC and 64 listings in COMPUTE!'s Gazette now have a checksum number appended to the end of each line, for example ":rem 123". Don't enter this statement when typing in a program. It is just for your information. The rem makes the number harmless if someone does type it in. It will, however, use up memory if you enter it, and it will confuse the Proofreader, even if you entered the rest of the line correctly.

When you type in a line from a program listing and press RETURN, the Proofreader displays a number at the top of your screen. This checksum number must match the checksum number in the printed listing. If it doesn't, it means you typed the line differently than the way it is listed. Immediately recheck your typing. Remember, don't type the rem statement with the checksum number; it is published only so you can check it against the number which appears on your screen.

The Proofreader is not picky with spaces. It will not notice extra spaces or missing ones. This is for your convenience, since spacing is generally not important. But occasionally proper spacing is important, so be extra careful with spaces, since the Proofreader will catch practically everything else that can go wrong.

There's another thing to watch out for: if you enter the line by using abbreviations for commands, the checksum will not match up. But there is a way to make the Proofreader check it. After entering the line, LIST it. This eliminates the abbreviations. Then move the cursor up to the line and press RETURN. It should now match the checksum. You can check whole groups of lines this way.

Special Tape SAVE Instructions

When you're done typing a listing, you must disable the Proofreader before SAVEing the program on tape. Disable the Proofreader by pressing RUN/STOP-RESTORE (hold down the RUN/STOP key and sharply hit the RESTORE key). This procedure is not necessary for disk SAVES, but you must disable the Proofreader this way before a tape SAVE.

SAVE to tape erases the Proofreader from memory, so you'll have to LOAD and RUN it again if you want to type another listing. SAVE to disk does not erase the Proofreader.

Since the Proofreader is a machine language program stored in the cassette buffer, it will be erased during a tape SAVE or LOAD. If you intend to type in a program in more than one sitting or wish to make a safety SAVE, follow this procedure:

1. LOAD and RUN the Proofreader.
2. Disable it by pressing RUN/STOP-RESTORE.
3. Type the following three lines in direct mode (without line numbers):

```
A$="PROOFREADER.T":B$="{10 SPACES}":FO
RX=1TO4:A$=A$+B$:NEXTX
FORX=886 TO 1018:A$=A$+CHR$(PEEK(X)):N
EXTX
OPEN1,1,1,A$:CLOSE1
```

After you type the last line, you will be asked to press RECORD and PLAY. We recommend you start at the beginning of a new tape.

You now have a new version of the Proofreader (PROOFREADER.T, as renamed in the above code). Turn your computer off and on, then LOAD the program you were working on. Put the cassette containing PROOFREADER.T into the tape unit and type:

```
OPEN1:CLOSE1
```

You can now get into the Proofreader by typing SYS 886. To test this, PRINT PEEK (886) should return the number 173. If it does not, repeat the steps above, making sure that A\$ (PROOFREADER.T) contains 13 characters and that B\$ contains 10 spaces.

The new version of Automatic Proofreader will load itself into the cassette buffer whenever you type OPEN1:CLOSE1 and PROOFREADER.T is the next program on your tape. It will not disturb the contents of BASIC memory.

Automatic Proofreader For VIC And 64

```
100 PRINT"{CLR}PLEASE WAIT...":FORI=886TO
1018:READA:CK=CK+A:POKEI,A:NEXT
110 IF CK<>17539 THEN PRINT"{DOWN}YOU MAD
E AN ERROR":PRINT"IN DATA STATEMENTS.
":END
120 SYS886:PRINT"{CLR}[2 DOWN]PROOFREADER
ACTIVATED.":NEW
886 DATA 173,036,003,201,150,208
892 DATA 001,096,141,151,003,173
898 DATA 037,003,141,152,003,169
904 DATA 150,141,036,003,169,003
910 DATA 141,037,003,169,000,133
916 DATA 254,096,032,087,241,133
922 DATA 251,134,252,132,253,008
928 DATA 201,013,240,017,201,032
934 DATA 240,005,024,101,254,133
940 DATA 254,165,251,166,252,164
946 DATA 253,040,096,169,013,032
952 DATA 210,255,165,214,141,251
958 DATA 003,206,251,003,169,000
964 DATA 133,216,169,019,032,210
970 DATA 255,169,018,032,210,255
976 DATA 169,058,032,210,255,166
982 DATA 254,169,000,133,254,172
988 DATA 151,003,192,087,208,006
994 DATA 032,205,189,076,235,003
1000 DATA 032,205,221,169,032,032
1006 DATA 210,255,032,210,255,173
1012 DATA 251,003,133,214,076,173
1018 DATA 003
```


MLX Machine Language Entry Program

For Commodore 64

Charles Brannon, Program Editor

MLX is a labor-saving utility that allows almost fail-safe entry of machine language programs published in COMPUTE!. You need to know nothing about machine language to use MLX—it was designed for everyone.

MLX is a new way to enter long machine language (ML) programs with a minimum of fuss. MLX lets you enter the numbers from a special list that looks similar to BASIC DATA statements. It checks your typing on a line-by-line basis. It won't let you enter illegal characters when you should be typing numbers. It won't let you enter numbers greater than 255 (forbidden in ML). It won't let you enter the wrong numbers on the wrong line. In addition, MLX creates a ready-to-use tape or disk file. You can then use the LOAD command to read the program into the computer, as with any program:

```
LOAD "filename",1,1 (for tape)
LOAD "filename",8,1 (for disk)
```

To start the program, you enter a SYS command that transfers control from BASIC to machine language. The starting SYS number always appears in the appropriate article.

Using MLX

Type in and save MLX (you'll want to use it in the future). When you're ready to type in an ML program, run MLX. MLX asks you for two numbers: the starting address and the ending address. These numbers are given in the article accompanying the ML program.

You'll see a prompt corresponding to the starting address. The prompt is the current line you are entering from the listing. It increases by six each time you enter a line. That's because each line has seven numbers—six actual data numbers plus a *checksum number*. The checksum verifies that you typed the previous six numbers correctly. If you enter any of the six numbers wrong, or enter the checksum wrong, the computer rings a buzzer and prompts you to reenter the line. If you enter it correctly, a bell tone sounds and you continue to the next line.

MLX accepts only numbers as input. If you make a typing error, press the INST/DEL key; the entire number is deleted. You can press it as many times as necessary back to the start of the line. If you enter three-digit numbers as listed, the computer automatically prints the comma and goes on to accept the next number. If you enter less than three digits, you can press either the SPACE bar or RETURN key to advance to the next number. The checksum automati-

cally appears in inverse video for emphasis.

To simplify your typing, MLX redefines part of the keyboard as a numeric keypad:

U	I	O			7	8	9	
H	J	K	L	become	0	4	5	6
M	,	.				1	2	3

MLX Commands

When you finish typing an ML listing (assuming you type it all in one session) you can then save the completed program on tape or disk. Follow the screen instructions. If you get any errors while saving, you probably have a bad disk, or the disk is full, or you've made a typo when entering the MLX program itself.

You don't have to enter the whole ML program in one sitting. MLX lets you enter as much as you want, save it, and then reload the file from tape or disk later.

MLX recognizes these commands:

SHIFT-S: Save	SHIFT-N: New Address
SHIFT-S: Load	SHIFT-D: Display

When you enter a command, MLX jumps out of the line you've been typing, so we recommend you do it at a new prompt. Use the Save command to save what you've been working on. It will save on tape or disk, as if you've finished, but the tape or disk won't work, of course, until you finish the typing. Remember what address you stop at. The next time you run MLX, answer all the prompts as you did before, then insert the disk or tape. When you get to the entry prompt, press SHIFT-L to reload the partly completed file into memory. Then use the New Address command to resume typing.

To use the New Address command, press SHIFT-N and enter the address where you previously stopped. The prompt will change, and you can then continue typing. Always enter a New Address that matches up with one of the line numbers in the special listing, or else the checksum won't work. The Display command lets you display a section of your typing. After you press SHIFT-D, enter two addresses within the line number range of the listing. You can abort the listing by pressing any key.

What if you forgot where you stopped typing? Use the Display command to scan memory from the beginning to the end of the program. When you reach the end of your typing, the lines will contain a random pattern of numbers. When you see the end of your typing, press any key to stop the listing. Use the New Address command to continue typing from the proper location.

See program listing on page 186.

Bug-Swatter: Modifications And Corrections

● "Vocab Builder" (October) was written to run on both a VIC and 64, with either a disk or tape drive. Several tape users have written to say the program does not save or load test items.

There are two places in the program where the disk error channel is checked. When the program was tested, it worked with tape, but only because a disk drive was also connected to the computer. If you own a Datassette, but not a disk drive, delete lines 572, 575, 902, and 905. Then change the following lines:

```
570 OPEN1,1,1,N$
900 OPEN1,1,0,N$
```

● Both VIC and 64 versions of "Beekeeper" (July) work as listed, but they suffer from a subtle programming error. Reader Bob Lynch became proficient enough to reach the nineteenth level (a feat unmatched by our testers) and got an OUT OF MEMORY error.

This condition can be traced to line 410, where the swarm level is updated. A GOTO jumps out of the subroutine in lines 300-480. The GOSUBs build up on the stack until level 19, where the computer thinks it is nineteen subroutines into the program. The stack fills up and the game stops. If you think you can reach level 19, make the following changes (both versions).

First, at the end of line 410, change GOTO45 to RETURN. Then, LIST lines 150 and 210, add a colon and the following line (immediately after the GOSUB):

```
ON(I=4001+2)GOTO45,xxx
```

In place of xxx put the next line (160 or 220). Finally, LIST lines 100 and 270. In line 100, eliminate the GOTO after the GOSUB, add the ON-GOTO line above, with the number 120 in lieu of xxx. In line 270, delete GOTO50, add the ON-GOTO after the GOSUB, with the number 50 instead of xxx. These changes will allow you to go beyond swarm 19.

● The 64 version of "The Tomb" (October) works as listed, except the high score remains at zero. Line 4010 is the culprit, and can be fixed by deleting the less than (<) character. The line should read IF SC>PH THEN PH=SC. Thanks to Reader Jim Willman for this correction. **6**

NEW!

Universal Parallel Graphics Interface



- Built-in self-test with status report
- Optional RAM printer buffer
- Provides virtually total emulation of Commodore printers for compatibility with popular software
- ASCII conversion, total test, Emulate & transparent mode
- Fully intelligent interface that plugs into standard Commodore printer socket
- Exclusive graphic key-match function
- Switch selectable Commodore graphics mode for Epson, StarMicro, C.Itoh, Prowriter, Okidata, Seikosha, Banana, BMC, Panasonic, Mannesman Talley & others.

Micrografix MW-350 \$129.00
MW-302C Printer Interface also available at \$79.95



Dealer
inquiries invited.

Micro World Electronix, Inc.
3333 S. Wadsworth Blvd., # C105,
Lakewood, CO 80227
(303) 987-9532 or 987-2671

SATISFACTION GUARANTEED OR MONEY BACK

1984 TAX RETURN HELPER

Fast and easy
income tax preparation.

- Form 1040 and Schedules A,B,C, D,E,G,SE,W and Form 2441
- Plus TAX DBASE - a data base program for tax related records that can be directly used in any of the forms (disk only)
- Enter and modify data on a screen copy of the form.
- Works like a spreadsheet - all the lines affected by a change are instantly updated.
- Automatic tax computation.
- Forms can be printed or saved.
- Price is tax deductible.
Tape \$23 Disk \$33 (+ \$1.50 S&H). Specify C64 or VIC 20 (16K RAM).
- Previous users discount \$11 (disk), \$7 (tape).



KSOFT CO.
845 WELLNER RD.
NAPERVILLE, IL 60540
(312) 961-1250



Dealer inquiries welcome

DISK RIOT

BONUS: Purchase 10 or more boxes of disks and earn a 5% discount

5 1/4" DISKETTES

MAXELL	MD-1	17.99/10
	MD-100 (SS/DD)	28.99/10
	MD-2	27.99/10
	MD-200 (DS/DD)	42.99/10
VERBATIM	SS/DD	21.99/10
(DATA LIFE)	DS/DD	31.99/10
VERBATIM	SS/DD	19.99/10
(VEREX)	DS/DD	27.99/10
DYSAN (with FREE library case)	SS/DD	29.99/10
	SS/DD	32.99/10
	DS/DD	38.99/10
	DS/DD	42.99/10
IRISH	SS/DD	14.99/10
	DS/DD	22.99/10
IBM	DS/DD	32.99/10
ULTRA-MAGNETICS (Bonus Package) for Commodore 64	SS/DD	22.99/12
	DS/DD	32.99/12
ELEPHANT	SS/SD	15.99/10
	SS/DD	18.99/10
3M	SS/DD	18.99/10
	DS/DD	25.99/10

5 1/4" BULK DISKETTES
With Hub Rings & Envelopes
Certified Error-Free
SS/DD \$70.50 \$130.100
DS/DD \$95.50 \$180.100

Disk File for 50 5 1/4" Diskettes 12.99
Disk File for 75 5 1/4" Diskettes 15.99
File & File 50 with lock 27.99
File for 150 5 1/4" Diskettes 19.99
Library Case for 5 1/4" Diskettes 1.85
Available in Beige, Gray, Black, Red, or Blue
3M Head Cleaner for 5 1/4" Disk Drives 24.99
Verbatim Head Cleaner, 5 1/4" Drives 11.99

COMMODORE 64

Commodore 64	299.00	Easy Calc	54.99
New 1541 Disk	244.99	Manager	38.99
1520 Printer	209.00	Fetch 64	34.99
WP400 Printer	219.99	Loop	34.99
1700 Monitor	244.99	Superbase 64	84.99
RS-232 Interface	44.99	Virtual Basic	38.99
1900 Modem	54.99	Multicall 1.2.3	99.00
1800 Automodem	84.99	Paperclip	66.00
CP/W Modem	84.99	or 12/Spitpack	88.00
C74 Cassette	50.99	Mirage Prolog	88.99
HC Modem II	88.99	The Consultant	74.99
MS2 (Single)	349.99	Multiplex	84.99
MS3 (Double)	549.99	Typing Tutor III	39.99
Compuarc	CALL	Dr. Doctor	22.99
Super Expander	34.99	Summer Games	79.99
2.80 Pack	189.99	Flight Simulator II	59.99
COML	59.99	Print	44.99
ROM Task	59.99	Superwriter	31.99
NT Terminal	189.99	Baron & SAT	89.99
Programmer's Reference Guide	79.99		
All Above \$aves			

REPLACEMENT PARTS

Heavy Duty Power Supply 39.99
I/O Cable for Commodore 64 14.95
All Other Parts in Stock - Call for Details

JOYSTICKS

WICO Command Control	21.99/ea
WICO 3-Way	22.99/ea
Power Grip	21.99/ea
The Boss	17.99/ea
Kraft Joystick	12.99/ea
Trak Ball	34.99/ea
T.E. Joystick	24.99/ea
Atari Joystick (Original)	7.99/ea
Atari Paddles (Original)	12.49/set
Keala Pad for Commodore (ROM)	79.99
Keala Pad for Commodore (Disk)	99.99

CALL OUR ORDER DESK TOLL-FREE
1-800-255-5905

For information or to order
from NY, Alaska, Hawaii call 212-219-2333

BROADWAY
COMPUTER CORPORATION
423 Broadway, New York, NY 10013

Telecommunications Software

(Article on page 118.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

Requires MLX (see instructions in article).

Program 1: Tables Setup

2049 :011,008,010,000,158,050,238
2055 :048,054,049,000,000,000,158
2061 :024,169,170,105,022,133,124
2067 :253,169,008,105,053,133,228
2073 :254,162,000,142,102,008,181
2079 :169,170,133,251,169,008,163
2085 :133,252,169,000,168,145,136
2091 :251,230,251,166,251,224,136
2097 :000,208,002,230,252,166,139
2103 :251,228,253,208,235,166,116
2109 :252,228,253,208,229,169,120
2115 :001,162,008,160,001,032,175
2121 :186,255,169,006,162,103,186
2127 :160,008,032,189,255,169,124
2133 :109,133,251,169,008,133,120
2139 :252,166,253,164,254,169,069
2145 :251,032,216,255,000,000,083
2151 :084,065,066,076,069,083,034
2157 :001,008,049,058,085,080,134
2163 :048,049,044,080,044,087,211
2169 :000,104,002,104,000,115,190
2175 :001,115,255,255,001,000,242
2181 :001,000,001,000,002,000,137
2187 :000,121,002,121,000,133,004
2193 :001,133,000,139,003,139,048
2199 :001,000,000,001,000,000,153
2205 :049,000,000,000,000,000,206
2211 :048,000,000,000,000,000,211
2217 :049,000,013,013,013,013,014

Program 2: C/G Bulletin Board, Part 1

Note: See article before typing in. Part 2 will be published next month.

2049 :011,008,010,000,158,050,238
2055 :048,054,049,000,000,000,158
2061 :120,169,064,141,020,003,018
2067 :169,015,141,021,003,088,200
2073 :165,001,041,254,133,001,108
2079 :169,147,032,210,255,169,245
2085 :013,032,210,255,169,006,210
2091 :141,032,208,169,001,141,223
2097 :033,208,162,058,141,003,142
2103 :065,173,024,208,009,002,024
2109 :141,024,208,032,202,020,176
2115 :169,006,141,147,002,032,052
2121 :078,008,076,115,008,162,008
2127 :000,142,161,069,162,162,007

2133 :134,251,162,069,134,252,063
2139 :172,161,069,169,000,145,039
2145 :251,032,130,038,174,161,115
2151 :069,224,060,208,239,166,045
2157 :252,224,087,144,233,096,121
2163 :032,091,038,169,032,141,106
2169 :043,025,169,069,141,044,100
2175 :025,032,034,025,032,004,023
2181 :038,162,000,142,014,071,048
2187 :032,076,038,032,176,025,006
2193 :173,242,071,201,020,208,036
2199 :019,174,014,071,224,000,141
2205 :240,236,206,014,071,173,073
2211 :242,071,032,210,255,076,025
2217 :139,008,201,013,240,009,011
2223 :141,012,071,032,210,255,128
2229 :076,139,008,032,210,255,133
2235 :032,174,045,174,237,071,152
2241 :224,000,208,174,173,012,216
2247 :071,201,049,208,008,162,130
2253 :000,142,005,070,076,008,250
2259 :009,162,001,142,005,070,088
2265 :173,012,071,201,050,208,164
2271 :024,162,009,142,160,069,021
2277 :162,048,142,013,065,142,033
2283 :194,067,142,226,067,162,069
2289 :001,142,252,069,076,008,021
2295 :009,173,012,071,201,051,252
2301 :240,009,032,240,037,032,075
2307 :048,046,076,115,008,032,072
2313 :095,024,032,157,045,032,138
2319 :204,255,169,003,162,008,048
2325 :160,000,032,186,255,169,055
2331 :006,162,103,160,067,032,045
2337 :189,255,169,000,162,176,216
2343 :160,103,032,213,255,162,196
2349 :000,142,161,069,032,204,141
2355 :255,032,048,046,076,099,095
2361 :017,162,000,142,023,071,216
2367 :032,048,046,032,091,038,094
2373 :169,137,141,043,025,169,241
2379 :066,141,044,025,032,034,161
2385 :025,032,204,045,174,237,030
2391 :071,224,000,208,097,162,081
2397 :001,142,249,071,169,167,124
2403 :141,043,025,169,066,141,172
2409 :044,025,032,034,025,032,041
2415 :076,038,032,176,025,173,119
2421 :242,071,201,049,208,003,123
2427 :076,186,015,201,050,208,091
2433 :184,169,019,141,102,072,048
2439 :032,112,030,169,049,141,156
2445 :016,071,169,048,141,017,091
2451 :071,141,018,071,141,019,096
2457 :071,162,002,142,014,071,103
2463 :174,014,071,189,094,068,001
2469 :158,019,072,238,014,071,225
2475 :174,014,071,224,007,144,037
2481 :237,174,014,071,169,027,101
2487 :157,019,072,076,248,011,254
2493 :162,000,142,249,071,032,077
2499 :112,030,169,000,141,213,092
2505 :064,141,214,064,141,102,159
2511 :072,169,002,162,002,160,006
2517 :255,032,186,255,169,001,087
2523 :162,147,160,002,032,189,143
2529 :255,032,192,255,032,102,069
2535 :027,162,000,142,102,072,224
2541 :142,003,070,169,032,141,026
2547 :003,221,169,000,141,001,010

2553 : 221, 173, 001, 221, 041, 008, 146
2559 : 201, 000, 208, 247, 169, 032, 088
2565 : 141, 001, 221, 173, 003, 221, 253
2571 : 041, 251, 141, 003, 221, 173, 073
2577 : 001, 221, 041, 016, 201, 000, 241
2583 : 208, 239, 032, 204, 255, 162, 099
2589 : 002, 032, 198, 255, 032, 207, 243
2595 : 255, 201, 019, 208, 006, 141, 097
2601 : 102, 072, 076, 053, 010, 201, 043
2607 : 022, 208, 003, 141, 102, 072, 083
2613 : 032, 204, 255, 162, 002, 032, 228
2619 : 201, 255, 169, 002, 032, 210, 160
2625 : 255, 032, 210, 255, 174, 102, 069
2631 : 072, 224, 000, 240, 205, 162, 206
2637 : 000, 142, 003, 070, 032, 091, 159
2643 : 038, 160, 000, 132, 251, 132, 028
2649 : 252, 132, 253, 140, 150, 072, 064
2655 : 142, 060, 087, 132, 254, 032, 034
2661 : 064, 038, 162, 001, 142, 023, 019
2667 : 071, 162, 000, 138, 142, 178, 030
2673 : 002, 174, 178, 002, 157, 016, 130
2679 : 071, 157, 001, 072, 238, 178, 068
2685 : 002, 174, 178, 002, 224, 006, 199
2691 : 208, 237, 032, 112, 030, 169, 151
2697 : 174, 141, 043, 025, 169, 061, 238
2703 : 141, 044, 025, 032, 034, 025, 188
2709 : 032, 234, 020, 032, 091, 038, 084
2715 : 162, 000, 142, 014, 071, 032, 064
2721 : 102, 025, 032, 076, 038, 032, 210
2727 : 176, 025, 173, 242, 071, 201, 031
2733 : 020, 240, 066, 201, 013, 240, 185
2739 : 027, 174, 014, 071, 157, 016, 126
2745 : 071, 032, 189, 022, 238, 014, 239
2751 : 071, 174, 014, 071, 224, 005, 238
2757 : 144, 223, 162, 000, 142, 020, 120
2763 : 071, 076, 233, 010, 174, 014, 013
2769 : 071, 224, 000, 208, 003, 076, 023
2775 : 203, 025, 173, 016, 071, 201, 136
2781 : 049, 208, 009, 032, 091, 038, 136
2787 : 032, 095, 024, 076, 002, 011, 211
2793 : 238, 150, 072, 032, 240, 037, 234
2799 : 076, 149, 010, 174, 014, 071, 221
2805 : 224, 000, 240, 173, 206, 014, 078
2811 : 071, 032, 189, 022, 076, 166, 039
2817 : 010, 162, 000, 142, 178, 002, 239
2823 : 174, 178, 002, 189, 016, 071, 125
2829 : 201, 000, 240, 009, 157, 001, 109
2835 : 072, 238, 178, 002, 076, 007, 080
2841 : 011, 032, 213, 029, 174, 213, 185
2847 : 064, 224, 000, 208, 010, 174, 199
2853 : 214, 064, 224, 000, 208, 003, 238
2859 : 076, 233, 010, 032, 124, 030, 036
2865 : 032, 120, 029, 169, 001, 032, 176
2871 : 195, 255, 174, 250, 071, 224, 200
2877 : 000, 240, 019, 162, 042, 142, 154
2883 : 014, 071, 024, 162, 084, 142, 052
2889 : 015, 071, 162, 000, 142, 161, 112
2895 : 069, 076, 096, 011, 162, 000, 237
2901 : 142, 014, 071, 142, 161, 069, 172
2907 : 162, 042, 142, 015, 071, 174, 185
2913 : 014, 071, 172, 161, 069, 189, 005
2919 : 164, 069, 153, 006, 072, 238, 037
2925 : 014, 071, 238, 161, 069, 174, 068
2931 : 014, 071, 236, 015, 071, 208, 218
2937 : 230, 162, 000, 142, 150, 072, 109
2943 : 174, 249, 071, 224, 000, 240, 061
2949 : 001, 096, 174, 047, 072, 224, 235
2955 : 000, 240, 016, 169, 192, 141, 129
2961 : 043, 025, 169, 065, 141, 044, 120
2967 : 025, 032, 034, 025, 076, 232, 063

2973 : 009, 032, 091, 038, 032, 048, 151
2979 : 046, 032, 234, 020, 032, 235, 250
2985 : 023, 174, 090, 072, 224, 000, 240
2991 : 208, 045, 032, 119, 025, 173, 009
2997 : 090, 072, 201, 000, 208, 035, 019
3003 : 162, 000, 142, 150, 072, 032, 233
3009 : 062, 023, 032, 117, 023, 032, 226
3015 : 204, 255, 162, 004, 032, 201, 033
3021 : 255, 169, 013, 032, 210, 255, 115
3027 : 032, 204, 255, 169, 004, 032, 139
3033 : 195, 255, 076, 228, 011, 032, 246
3039 : 198, 023, 076, 158, 011, 032, 209
3045 : 188, 020, 174, 249, 071, 224, 131
3051 : 000, 208, 010, 174, 003, 070, 188
3057 : 224, 001, 208, 003, 076, 093, 078
3063 : 013, 032, 188, 028, 032, 091, 119
3069 : 038, 174, 002, 070, 224, 000, 249
3075 : 240, 003, 032, 220, 020, 174, 180
3081 : 001, 070, 224, 001, 208, 003, 004
3087 : 076, 252, 020, 174, 248, 071, 088
3093 : 224, 001, 208, 055, 032, 091, 120
3099 : 038, 162, 000, 142, 212, 080, 149
3105 : 162, 000, 236, 023, 071, 240, 253
3111 : 010, 162, 000, 142, 023, 071, 191
3117 : 162, 001, 142, 212, 080, 169, 043
3123 : 144, 141, 043, 025, 169, 068, 129
3129 : 141, 044, 025, 032, 034, 025, 102
3135 : 174, 212, 080, 224, 001, 208, 194
3141 : 010, 162, 000, 142, 212, 080, 163
3147 : 162, 001, 142, 023, 071, 032, 250
3153 : 162, 025, 169, 032, 141, 242, 084
3159 : 071, 032, 189, 022, 032, 004, 181
3165 : 038, 032, 176, 025, 173, 242, 011
3171 : 071, 141, 243, 071, 032, 189, 078
3177 : 022, 169, 013, 141, 242, 071, 251
3183 : 032, 189, 022, 162, 000, 142, 146
3189 : 239, 080, 173, 243, 071, 201, 100
3195 : 049, 208, 003, 076, 146, 030, 123
3201 : 174, 008, 070, 224, 000, 240, 077
3207 : 003, 076, 245, 012, 201, 050, 210
3213 : 208, 003, 076, 115, 046, 174, 251
3219 : 005, 070, 224, 000, 240, 092, 010
3225 : 201, 051, 208, 018, 162, 001, 026
3231 : 142, 239, 080, 174, 252, 069, 091
3237 : 224, 001, 208, 003, 032, 174, 039
3243 : 020, 076, 237, 057, 201, 052, 046
3249 : 208, 018, 162, 001, 142, 239, 179
3255 : 080, 174, 252, 069, 224, 001, 215
3261 : 208, 003, 032, 174, 020, 076, 190
3267 : 115, 046, 201, 053, 208, 020, 070
3273 : 174, 249, 071, 224, 000, 208, 103
3279 : 013, 174, 252, 069, 224, 001, 172
3285 : 208, 003, 032, 174, 020, 076, 214
3291 : 217, 038, 201, 054, 208, 020, 189
3297 : 174, 249, 071, 224, 000, 208, 127
3303 : 013, 174, 252, 069, 224, 001, 196
3309 : 208, 003, 032, 174, 020, 076, 238
3315 : 040, 042, 201, 055, 208, 008, 029
3321 : 162, 001, 142, 002, 070, 076, 190
3327 : 228, 011, 201, 056, 208, 081, 016
3333 : 174, 249, 071, 224, 000, 208, 163
3339 : 074, 174, 008, 070, 224, 000, 049
3345 : 208, 067, 169, 168, 141, 043, 045
3351 : 025, 169, 068, 141, 044, 025, 239
3357 : 032, 034, 025, 032, 004, 038, 194
3363 : 032, 176, 025, 173, 242, 071, 242
3369 : 201, 049, 208, 017, 032, 188, 224
3375 : 028, 032, 109, 024, 162, 000, 146
3381 : 142, 004, 070, 032, 204, 016, 009
3387 : 076, 228, 011, 201, 050, 240, 097

3393 :003,076,228,011,032,188,091
3399 :028,032,068,037,162,000,142
3405 :142,004,070,032,204,016,033
3411 :076,228,011,201,057,240,128
3417 :003,076,228,011,173,003,071
3423 :221,009,016,141,003,221,194
3429 :173,001,221,009,016,141,150
3435 :001,221,162,000,142,001,122
3441 :070,142,003,070,162,255,047
3447 :154,174,204,103,224,000,210
3453 :240,026,174,157,072,142,168
3459 :244,103,174,158,072,142,000
3465 :202,103,174,159,072,142,221
3471 :245,103,032,017,057,162,247
3477 :000,142,162,069,174,162,090
3483 :069,224,000,240,008,032,216
3489 :017,057,162,000,142,162,189
3495 :069,174,211,080,224,000,157
3501 :240,023,162,000,142,211,183
3507 :080,032,204,255,162,001,145
3513 :032,201,255,169,146,032,252
3519 :210,255,169,026,032,210,069
3525 :255,032,204,255,169,001,089
3531 :032,195,255,169,003,032,121
3537 :195,255,174,023,071,224,127
3543 :000,208,003,076,192,014,196
3549 :174,008,070,224,000,240,169
3555 :008,162,000,142,008,070,105
3561 :076,192,014,032,085,023,143
3567 :173,254,071,141,000,072,182
3573 :169,000,141,255,071,173,030
3579 :253,071,201,000,240,035,027
3585 :162,000,142,014,071,248,126
3591 :024,169,096,109,000,072,221
3597 :141,000,072,173,255,071,213
3603 :105,000,141,255,071,216,039
3609 :238,014,071,174,014,071,095
3615 :236,253,071,144,226,174,111
3621 :060,087,224,001,240,077,214
3627 :162,000,142,060,087,032,014
3633 :117,023,032,204,255,162,074
3639 :004,032,201,255,173,255,207
3645 :071,041,240,074,074,074,123
3651 :074,009,048,032,210,255,183
3657 :173,255,071,041,015,009,125
3663 :048,032,210,255,173,000,029
3669 :072,041,240,074,074,074,148
3675 :074,009,048,032,210,255,207
3681 :173,000,072,041,015,009,151
3687 :048,032,210,255,169,013,062
3693 :032,210,255,032,204,255,073
3699 :169,004,032,195,255,248,250
3705 :024,173,000,072,109,046,033
3711 :072,141,000,072,173,255,072
3717 :071,109,046,072,141,046,106
3723 :072,216,174,006,070,142,051
3729 :213,064,174,007,070,142,047
3735 :214,064,162,000,142,004,225
3741 :070,174,214,064,224,000,135
3747 :208,010,174,213,064,224,032
3753 :000,208,003,076,178,014,136
3759 :032,204,016,169,000,141,225
3765 :253,071,141,254,071,141,088
3771 :255,071,141,000,072,032,246
3777 :204,255,162,015,032,201,038
3783 :255,162,000,142,014,071,075
3789 :174,014,071,189,158,067,110
3795 :201,000,240,009,032,210,135
3801 :255,238,014,071,076,205,052
3807 :014,032,204,255,169,015,144

3813 :032,195,255,032,202,020,197
3819 :032,102,027,169,003,162,218
3825 :008,160,000,032,186,255,114
3831 :169,008,162,101,160,067,146
3837 :032,189,255,169,176,133,183
3843 :251,169,103,133,252,162,049
3849 :000,160,157,169,251,032,010
3855 :216,255,173,003,221,041,156
3861 :223,141,003,221,173,001,015
3867 :221,041,223,141,001,221,107
3873 :032,204,255,174,248,071,249
3879 :224,001,208,008,162,000,130
3885 :142,248,071,076,058,009,137
3891 :174,023,071,224,000,208,239
3897 :003,076,058,009,076,232,255
3903 :009,072,173,003,221,041,070
3909 :251,141,003,221,173,001,091
3915 :221,041,016,201,000,240,026
3921 :005,169,001,141,003,070,214
3927 :173,119,002,201,000,240,054
3933 :060,141,247,071,201,137,182
3939 :208,011,169,000,141,001,117
3945 :070,032,158,015,076,154,098
3951 :015,201,133,208,011,169,080
3957 :001,141,001,070,032,158,008
3963 :015,076,154,015,201,140,212
3969 :208,011,169,000,141,248,138
3975 :071,032,158,015,076,154,129
3981 :015,201,136,208,008,169,110
3987 :001,141,248,071,032,158,030
3993 :015,104,076,049,234,142,005
3999 :239,071,162,000,142,240,245
4005 :071,174,240,071,157,119,229
4011 :002,238,240,071,174,240,112
4017 :071,224,010,208,240,174,080
4023 :239,071,096,032,048,046,203
4029 :032,091,038,162,001,142,143
4035 :004,070,169,225,141,043,079
4041 :025,169,065,141,044,025,158
4047 :032,034,025,032,048,046,168
4053 :032,112,030,032,149,010,066
4059 :032,091,038,169,243,141,165
4065 :043,025,169,065,141,044,200
4071 :025,032,034,025,032,048,171
4077 :046,032,004,038,032,076,209
4083 :038,032,176,025,173,242,161
4089 :071,032,210,255,032,048,129
4095 :046,173,242,071,201,049,013
4101 :208,049,032,235,023,162,202
4107 :000,142,014,071,174,014,170
4113 :071,189,033,071,157,006,032
4119 :072,032,210,255,238,014,076
4125 :071,174,014,071,224,012,083
4131 :144,234,032,174,045,174,070
4137 :237,071,224,000,208,216,229
4143 :032,091,038,032,095,024,103
4149 :076,219,015,201,050,208,054
4155 :019,032,068,037,032,174,165
4161 :045,174,237,071,224,000,048
4167 :208,243,032,095,024,076,237
4173 :219,015,201,051,208,043,046
4179 :169,232,141,043,025,169,094
4185 :063,141,044,025,032,034,172
4191 :025,032,204,045,174,237,044
4197 :071,224,000,240,003,076,203
4203 :219,015,169,000,141,045,184
4209 :072,141,046,072,141,047,120
4215 :072,032,095,024,076,219,125
4221 :015,201,052,208,067,032,188
4227 :091,038,169,174,141,043,019

4233 :025,169,065,141,044,025,094
4239 :032,034,025,032,048,046,104
4245 :032,004,038,032,176,025,200
4251 :032,210,255,201,049,208,086
4257 :014,169,000,141,047,072,092
4263 :032,091,038,032,095,024,223
4269 :076,219,015,201,050,240,206
4275 :006,032,240,037,076,130,188
4281 :016,162,001,141,047,072,112
4287 :032,095,024,076,219,015,140
4293 :201,053,240,003,076,088,090
4299 :017,174,250,071,224,000,171
4305 :240,018,162,042,142,014,059
4311 :071,162,084,142,015,071,248
4317 :162,000,142,161,069,076,063
4323 :242,016,162,000,142,161,182
4329 :069,142,014,071,162,042,221
4335 :142,015,071,174,014,071,214
4341 :172,161,069,185,006,072,142
4347 :157,164,069,238,014,071,196
4353 :238,161,069,174,014,071,216
4359 :236,015,071,208,230,173,172
4365 :006,070,141,213,064,173,168
4371 :007,070,141,214,064,032,035
4377 :124,030,032,167,029,169,064
4383 :001,032,195,255,174,004,180
4389 :070,224,000,208,001,096,124
4395 :032,048,046,169,106,141,073
4401 :043,025,169,066,141,044,025
4407 :025,032,034,025,032,204,151
4413 :045,174,237,071,224,000,044
4419 :208,003,076,186,015,162,205
4425 :000,142,249,071,032,188,243
4431 :028,162,000,142,004,070,229
4437 :076,058,009,169,020,032,193
4443 :210,255,032,240,037,076,173
4449 :219,015,032,204,255,169,223
4455 :003,174,160,069,160,000,157
4461 :032,186,255,169,005,162,150
4467 :193,160,067,032,189,255,243
4473 :169,000,162,252,160,080,176
4479 :032,213,255,032,237,054,182
4485 :162,032,142,242,103,162,208
4491 :000,142,144,082,142,145,026
4497 :082,142,146,082,142,066,037
4503 :104,142,067,104,142,148,090
4509 :082,142,149,082,169,049,062
4515 :141,198,067,169,252,133,099
4521 :251,169,080,133,252,141,171
4527 :243,103,169,150,133,253,202
4533 :169,082,133,254,162,018,231
4539 :142,023,070,032,048,046,036
4545 :032,048,046,162,000,142,111
4551 :014,071,032,091,038,174,107
4557 :014,071,189,245,067,157,180
4563 :150,082,201,000,240,009,125
4569 :032,210,255,238,014,071,013
4575 :076,204,017,032,048,046,134
4581 :032,091,038,172,242,103,139
4587 :140,161,069,177,251,174,183
4593 :145,082,157,126,086,238,051
4599 :145,082,032,130,038,172,078
4605 :161,069,177,251,174,145,206
4611 :082,157,126,086,238,145,069
4617 :082,032,130,038,172,161,112
4623 :069,177,251,201,066,240,251
4629 :003,076,214,018,174,144,138
4635 :082,224,000,208,085,162,020
4641 :000,142,024,070,174,024,211
4647 :070,189,169,067,201,000,223

4653 :240,026,172,023,070,145,209
4659 :253,032,210,255,238,024,039
4665 :070,238,023,070,174,023,143
4671 :070,224,000,208,225,230,252
4677 :254,076,037,018,032,048,022
4683 :046,162,000,142,024,070,007
4689 :174,024,070,189,204,067,041
4695 :201,000,240,026,172,023,237
4701 :070,145,253,032,210,255,034
4707 :238,024,070,238,023,070,250
4713 :174,023,070,224,000,208,036
4719 :225,230,254,076,081,018,227
4725 :206,145,082,206,145,082,215
4731 :174,145,082,189,126,086,157
4737 :141,066,104,238,145,082,137
4743 :174,145,082,189,126,086,169
4749 :141,067,104,174,144,082,085
4755 :224,000,208,009,032,048,156
4761 :046,032,095,024,076,058,228
4767 :009,162,000,142,024,070,054
4773 :174,024,070,189,204,067,125
4779 :201,000,240,023,172,023,062
4785 :070,145,253,238,024,070,209
4791 :238,023,070,174,023,070,013
4797 :224,000,208,228,230,254,053
4803 :076,165,018,172,023,070,207
4809 :169,000,145,253,032,048,080
4815 :046,032,095,024,076,058,026
4821 :009,201,034,240,003,076,008
4827 :010,018,162,000,142,024,063
4833 :070,162,000,142,147,082,060
4839 :032,130,038,173,146,082,064
4845 :174,148,082,157,146,086,006
4851 :174,024,070,189,198,067,197
4857 :172,023,070,145,253,032,176
4863 :210,255,032,161,020,238,147
4869 :024,070,174,024,070,224,079
4875 :003,208,229,238,148,082,151
4881 :174,146,082,172,161,069,053
4887 :177,251,157,156,086,172,254
4893 :023,070,145,253,032,210,250
4899 :255,032,161,020,032,130,153
4905 :038,238,146,082,238,147,162
4911 :082,172,161,069,177,251,191
4917 :201,034,240,020,174,146,100
4923 :082,157,156,086,172,023,223
4929 :070,145,253,032,210,255,006
4935 :032,161,020,076,039,019,162
4941 :032,130,038,172,161,069,167
4947 :177,251,201,032,208,003,187
4953 :076,077,019,201,080,240,014
4959 :008,162,001,142,163,069,128
4965 :076,109,019,162,000,142,097
4971 :163,069,174,146,082,169,142
4977 :044,157,156,086,238,146,172
4983 :082,238,147,082,174,163,237
4989 :069,224,000,208,005,169,032
4995 :080,076,137,019,169,083,183
5001 :174,146,082,157,156,086,170
5007 :174,225,080,157,215,080,050
5013 :238,225,080,238,146,082,134
5019 :238,147,082,169,044,174,241
5025 :146,082,157,156,086,238,002
5031 :146,082,238,147,082,169,007
5037 :082,174,146,082,157,156,202
5043 :086,238,146,082,238,147,092
5049 :082,173,147,082,174,149,224
5055 :082,157,050,087,162,000,217
5061 :142,024,070,174,024,070,189
5067 :189,201,067,201,000,240,077

5073 :017,172,023,070,145,253,121
5079 :032,210,255,032,161,020,157
5085 :238,024,070,076,200,019,080
5091 :032,048,046,032,091,038,002
5097 :162,000,142,014,071,169,023
5103 :009,141,043,025,169,068,182
5109 :141,044,025,032,034,025,034
5115 :032,048,046,032,076,038,011
5121 :032,016,023,173,242,071,046
5127 :201,020,208,041,174,014,153
5133 :071,224,000,240,239,173,192
5139 :242,071,032,210,255,206,011
5145 :014,071,206,023,070,174,071
5151 :023,070,224,255,208,005,048
5157 :166,254,202,134,254,172,195
5163 :023,070,169,000,145,253,191
5169 :076,001,020,173,242,071,120
5175 :032,210,255,172,023,070,049
5181 :145,253,141,242,071,032,177
5187 :161,020,173,242,071,201,167
5193 :013,240,026,238,014,071,163
5199 :174,014,071,224,050,208,052
5205 :171,169,013,032,210,255,167
5211 :206,023,070,172,023,070,143
5217 :145,253,032,161,020,238,178
5223 :144,082,174,144,082,224,185
5229 :010,240,028,238,149,082,088
5235 :024,173,242,103,105,032,026
5241 :141,242,103,173,243,103,102
5247 :105,000,141,243,103,133,084
5253 :252,238,198,067,076,226,166
5259 :017,162,000,142,066,104,118
5265 :142,067,104,172,023,070,211
5271 :169,000,145,253,032,188,170
5277 :028,076,058,009,238,023,077
5283 :070,174,023,070,224,000,212
5289 :208,002,230,254,096,169,104
5295 :015,032,195,255,169,009,082
5301 :141,205,020,032,202,020,033
5307 :096,169,015,032,195,255,181
5313 :169,008,141,205,020,032,000
5319 :202,020,096,169,015,162,095
5325 :008,160,015,032,186,255,093
5331 :169,000,032,189,255,032,120
5337 :192,255,096,169,115,141,161
5343 :043,025,169,068,141,044,201
5349 :025,032,034,025,096,174,103
5355 :150,072,224,003,144,010,070
5361 :104,104,162,001,142,060,046
5367 :087,076,251,022,096,032,043
5373 :188,028,169,094,141,043,148
5379 :025,169,068,141,044,025,219
5385 :032,034,025,032,044,022,198
5391 :162,000,142,253,069,142,015
5397 :012,071,032,204,255,032,115
5403 :228,255,141,012,071,201,167
5409 :000,240,045,162,001,142,111
5415 :253,069,173,012,071,201,050
5421 :028,176,030,201,013,240,221
5427 :026,201,020,240,022,201,249
5433 :020,144,003,076,015,021,080
5439 :201,017,176,011,201,014,171
5445 :240,007,201,005,240,003,253
5451 :076,015,021,076,115,021,143
5457 :032,204,255,162,002,032,000
5463 :198,255,032,228,255,201,232
5469 :000,240,175,141,012,071,220
5475 :032,204,029,174,088,072,186
5481 :224,000,208,228,032,204,233
5487 :255,076,041,021,173,012,177

5493 :071,201,147,208,008,169,153
5499 :000,141,012,071,076,228,139
5505 :021,174,253,069,224,000,102
5511 :208,003,076,228,021,173,076
5517 :012,071,201,137,208,014,016
5523 :032,089,022,162,000,142,082
5529 :002,070,142,001,070,076,002
5535 :228,011,201,140,208,008,187
5541 :169,000,141,012,071,076,122
5547 :228,021,201,134,208,006,201
5553 :238,032,208,076,165,021,149
5559 :201,138,208,006,238,033,239
5565 :208,076,165,021,201,135,227
5571 :208,003,076,165,021,201,101
5577 :139,208,008,169,001,141,099
5583 :213,080,076,165,021,201,195
5589 :136,208,003,076,165,021,054
5595 :201,133,208,005,169,000,167
5601 :141,012,071,032,075,022,066
5607 :173,012,071,201,000,162,082
5613 :002,032,201,255,173,012,144
5619 :071,032,210,255,032,204,023
5625 :029,174,088,072,224,000,068
5631 :208,240,032,204,255,173,087
5637 :012,071,032,210,255,173,246
5643 :012,071,201,034,208,004,029
5649 :169,000,133,212,174,213,150
5655 :080,224,000,240,013,162,230
5661 :000,142,213,080,032,204,188
5667 :255,169,147,032,210,255,079
5673 :076,012,021,165,209,133,145
5679 :243,024,165,210,109,173,203
5685 :065,133,244,164,211,177,023
5691 :209,073,128,145,209,177,232
5697 :243,141,117,072,173,134,177
5703 :002,145,243,096,164,211,164
5709 :177,209,073,128,145,209,250
5715 :173,117,072,145,243,096,161
5721 :032,204,255,169,146,032,159
5727 :210,255,032,204,255,096,123
5733 :032,204,255,174,023,071,092
5739 :224,000,240,010,169,000,238
5745 :170,168,032,219,255,076,009
5751 :137,022,032,204,255,032,033
5757 :228,255,201,000,240,246,015
5763 :141,242,071,076,175,022,090
5769 :032,204,255,162,002,032,056
5775 :198,255,032,228,255,141,228
5781 :242,071,201,000,208,020,123
5787 :174,003,070,224,001,208,067
5793 :003,076,251,022,032,222,255
5799 :255,224,070,144,221,076,133
5805 :251,022,032,204,029,174,117
5811 :088,072,224,000,208,208,211
5817 :032,204,255,096,032,204,240
5823 :255,173,242,071,032,210,150
5829 :255,174,023,071,224,000,176
5835 :240,024,032,204,255,162,096
5841 :002,032,201,255,173,242,090
5847 :071,032,210,255,032,204,251
5853 :029,174,088,072,224,000,040
5859 :208,232,032,204,255,096,230
5865 :032,204,255,162,001,032,151
5871 :198,255,032,207,255,141,047
5877 :242,071,032,204,255,096,121
5883 :169,056,141,043,025,169,086
5889 :067,141,044,025,032,034,088
5895 :025,162,000,142,003,070,153
5901 :076,093,013,032,101,022,094
5907 :173,242,071,201,003,240,181

5913 :035,201,013,240,031,201,234
5919 :020,240,027,201,032,144,183
5925 :234,201,091,144,019,201,159
5931 :097,144,226,201,123,144,210
5937 :011,201,193,144,218,201,249
5943 :219,144,003,076,016,023,024
5949 :096,173,015,220,041,127,221
5955 :141,015,220,169,000,141,241
5961 :011,220,141,010,220,141,048
5967 :009,220,141,008,220,096,005
5973 :169,000,141,253,071,141,092
5979 :254,071,173,011,220,141,193
5985 :253,071,173,010,220,141,197
5991 :254,071,173,008,220,173,234
5997 :253,071,041,127,141,253,227
6003 :071,096,032,048,046,032,184
6009 :157,045,032,048,046,032,225
6015 :204,255,169,004,162,004,157
6021 :160,255,032,186,255,169,166
6027 :000,032,189,255,032,192,071
6033 :255,162,004,032,201,255,030
6039 :169,017,032,210,255,173,239
6045 :017,071,032,210,255,173,147
6051 :018,071,032,210,255,173,154
6057 :019,071,032,210,255,032,020
6063 :204,255,096,032,048,046,088
6069 :169,247,141,043,025,169,207
6075 :061,141,044,025,032,034,012
6081 :025,032,218,023,096,032,107
6087 :048,046,169,006,141,043,140
6093 :025,169,063,141,044,025,160
6099 :032,034,025,032,218,023,063
6105 :096,169,016,141,043,025,195
6111 :169,063,141,044,025,032,185
6117 :034,025,238,150,072,096,076
6123 :032,090,030,162,000,142,179
6129 :090,072,169,006,141,043,250
6135 :025,169,063,141,044,025,202
6141 :032,034,025,032,004,038,162
6147 :160,000,140,161,069,032,053
6153 :076,038,032,016,023,173,111
6159 :242,071,201,020,208,030,019
6165 :172,161,069,192,000,240,087
6171 :239,032,189,022,206,161,108
6177 :069,169,000,141,242,071,213
6183 :172,161,069,173,242,071,159
6189 :153,033,071,076,011,024,157
6195 :201,013,240,024,172,161,094
6201 :069,173,242,071,153,033,030
6207 :071,172,161,069,173,242,183
6213 :071,153,033,071,238,161,028
6219 :069,076,011,024,173,161,077
6225 :069,201,000,208,008,238,037
6231 :150,072,162,001,142,090,192
6237 :072,096,169,141,141,043,243
6243 :025,169,062,141,044,025,053
6249 :032,034,025,096,032,048,116
6255 :046,162,000,142,014,071,034
6261 :174,014,071,169,000,157,190
6267 :006,072,238,014,071,174,186
6273 :014,071,224,013,208,238,129
6279 :169,155,141,043,025,169,069
6285 :062,141,044,025,032,034,223
6291 :025,169,006,141,043,025,044
6297 :169,063,141,044,025,032,115
6303 :034,025,032,004,038,162,198
6309 :000,142,014,071,032,016,184
6315 :023,173,242,071,201,020,133
6321 :208,030,174,014,071,224,130
6327 :000,240,239,206,014,071,185

6333 :032,189,022,169,000,141,230
6339 :242,071,174,014,071,173,172
6345 :242,071,157,006,072,076,057
6351 :169,024,201,003,240,212,032
6357 :201,013,240,022,174,014,109
6363 :071,173,242,071,157,006,171
6369 :072,238,014,071,174,014,040
6375 :071,224,012,208,189,076,243
6381 :239,024,032,048,046,169,027
6387 :228,141,043,025,169,062,143
6393 :141,044,025,032,034,025,038
6399 :032,048,046,032,235,023,159
6405 :032,119,025,173,090,072,004
6411 :240,012,032,048,046,032,165
6417 :240,037,032,048,046,076,240
6423 :109,024,032,048,046,162,188
6429 :001,142,004,070,096,162,248
6435 :000,142,015,071,174,015,196
6441 :071,189,174,061,141,242,151
6447 :071,201,000,240,049,174,014
6453 :023,071,224,000,240,024,123
6459 :032,204,255,162,002,032,234
6465 :201,255,173,242,071,032,015
6471 :210,255,032,204,029,174,207
6477 :088,072,224,000,208,232,133
6483 :032,204,255,173,242,071,036
6489 :032,210,255,032,204,255,053
6495 :238,015,071,076,039,025,047
6501 :096,169,247,141,043,025,054
6507 :169,061,141,044,025,032,067
6513 :034,025,032,004,038,096,086
6519 :160,255,140,161,069,162,042
6525 :000,142,090,072,238,161,060
6531 :069,172,161,069,185,006,025
6537 :072,192,012,240,014,172,071
6543 :161,069,217,033,071,240,166
6549 :235,169,001,141,090,072,089
6555 :096,169,000,141,090,072,211
6561 :096,169,047,141,043,025,170
6567 :169,063,141,044,025,032,129
6573 :034,025,096,032,101,022,227
6579 :173,242,071,201,020,240,102
6585 :016,201,013,240,012,201,100
6591 :003,240,008,201,048,144,067
6597 :234,201,058,176,230,096,168
6603 :169,002,141,043,025,169,240
6609 :062,141,044,025,032,034,035
6615 :025,162,000,142,014,071,117
6621 :142,023,070,142,024,070,180
6627 :162,001,142,008,070,162,004
6633 :000,142,014,071,174,024,146
6639 :070,224,000,208,006,032,011
6645 :000,027,076,037,026,224,123
6651 :001,208,006,032,019,027,032
6657 :076,037,026,224,002,208,062
6663 :006,032,038,027,076,037,223
6669 :026,224,003,208,006,032,000
6675 :057,027,076,037,026,224,210
6681 :004,208,006,032,076,027,122
6687 :076,037,026,076,185,026,201
6693 :032,016,023,173,242,071,082
6699 :201,020,208,033,174,014,181
6705 :071,224,000,240,239,032,087
6711 :189,022,206,014,071,169,214
6717 :000,141,242,071,174,014,191
6723 :071,173,242,071,157,049,062
6729 :071,076,037,026,076,251,098
6735 :022,201,003,208,006,032,039
6741 :089,045,076,232,009,201,225
6747 :013,240,022,174,014,071,113

6753 :173,242,071,157,049,071,092
6759 :032,189,022,238,014,071,157
6765 :174,014,071,224,030,208,062
6771 :177,174,014,071,169,013,221
6777 :157,049,071,162,000,142,190
6783 :014,071,032,174,045,174,125
6789 :237,071,240,006,032,048,255
6795 :046,076,232,025,174,023,203
6801 :070,172,014,071,185,049,194
6807 :071,157,079,071,141,242,144
6813 :071,238,014,071,238,023,044
6819 :070,173,242,071,201,013,165
6825 :208,228,162,000,142,014,155
6831 :071,238,024,070,032,048,146
6837 :046,076,232,025,169,048,009
6843 :141,017,071,141,018,071,134
6849 :141,019,071,032,117,023,084
6855 :032,204,255,162,004,032,120
6861 :201,255,162,000,142,014,211
6867 :071,169,017,032,210,255,197
6873 :174,014,071,189,079,071,047
6879 :032,210,255,238,014,071,019
6885 :174,014,071,236,023,070,049
6891 :144,236,169,013,032,210,015
6897 :255,032,204,255,169,004,136
6903 :032,195,255,032,095,024,112
6909 :076,228,011,032,091,038,217
6915 :032,048,046,169,243,141,170
6921 :043,025,169,066,141,044,241
6927 :025,076,092,027,032,091,102
6933 :038,032,048,046,169,249,091
6939 :141,043,025,169,066,141,100
6945 :044,025,076,092,027,032,073
6951 :091,038,032,048,046,169,207
6957 :009,141,043,025,169,067,243
6963 :141,044,025,076,092,027,200
6969 :032,091,038,032,048,046,088
6975 :169,027,141,043,025,169,125
6981 :067,141,044,025,076,092,002
6987 :027,032,091,038,032,048,087
6993 :046,169,038,141,043,025,031
6999 :169,067,141,044,025,032,053
7005 :034,025,032,004,038,032,002
7011 :076,038,096,162,000,142,101
7017 :227,080,142,015,071,032,160
7023 :204,255,162,015,032,198,209
7029 :255,032,228,255,172,015,050
7035 :071,153,058,072,238,015,218
7041 :071,201,013,208,240,169,007
7047 :000,172,015,071,153,058,092
7053 :072,173,058,072,201,050,255
7059 :144,048,201,052,144,004,228
7065 :201,054,144,040,162,001,243
7071 :142,227,080,162,000,142,144
7077 :015,071,032,204,255,169,143
7083 :013,032,210,255,174,015,102
7089 :071,189,058,072,141,049,245
7095 :072,238,015,071,032,210,053
7101 :255,173,049,072,201,013,184
7107 :208,234,032,204,255,096,200
7113 :162,000,142,213,064,142,156
7119 :214,064,173,168,002,201,005
7125 :000,240,070,032,182,028,253
7131 :032,226,028,032,226,028,023
7137 :141,213,064,173,167,002,217
7143 :141,214,064,169,000,141,192
7149 :167,002,173,168,002,032,013
7155 :182,028,032,226,028,024,251
7161 :109,213,064,141,213,064,029
7167 :173,167,002,109,214,064,216

7173 :141,214,064,024,173,168,021
7179 :002,010,010,024,109,213,123
7185 :064,141,213,064,173,214,118
7191 :064,105,000,141,214,064,099
7197 :024,173,169,002,240,043,168
7203 :010,010,010,141,168,002,120
7209 :173,169,002,010,024,109,016
7215 :168,002,141,168,002,169,185
7221 :000,109,214,064,141,214,027
7227 :064,024,173,168,002,109,087
7233 :213,064,141,213,064,169,161
7239 :000,109,214,064,141,214,045
7245 :064,173,170,002,024,109,107
7251 :213,064,141,213,064,141,151
7257 :251,071,173,214,064,105,199
7263 :000,141,214,064,141,252,139
7269 :071,169,000,141,250,071,035
7275 :173,213,064,106,176,008,079
7281 :169,001,141,250,071,076,053
7287 :138,028,024,173,251,071,036
7293 :105,001,141,251,071,173,099
7299 :252,071,105,000,141,252,184
7305 :071,173,251,071,201,000,136
7311 :208,012,173,252,071,201,036
7317 :000,208,005,169,002,141,162
7323 :251,071,078,252,071,110,220
7329 :251,071,173,251,071,141,095
7335 :213,064,141,006,070,173,066
7341 :252,071,141,214,064,141,032
7347 :007,070,096,234,010,010,094
7353 :010,010,096,032,204,255,024
7359 :169,147,032,210,255,173,153
7365 :024,208,009,002,141,024,093
7371 :208,169,006,141,032,208,199
7377 :169,001,141,033,208,032,025
7383 :091,038,169,010,141,242,138
7389 :071,032,244,036,096,234,166
7395 :010,046,167,002,096,234,014
7401 :010,046,057,072,046,056,008
7407 :072,096,162,000,142,014,213
7413 :071,142,023,070,142,090,015
7419 :072,174,014,071,189,230,233
7425 :103,141,242,071,238,014,042
7431 :071,173,242,071,201,000,253
7437 :208,237,174,023,070,189,146
7443 :251,103,141,242,071,238,041
7449 :023,070,173,242,071,201,037
7455 :000,208,237,174,014,071,223
7461 :236,023,070,176,003,076,109
7467 :108,029,174,014,071,236,163
7473 :023,070,240,003,076,114,063
7479 :029,162,000,142,014,071,217
7485 :174,014,071,189,230,103,074
7491 :141,242,071,174,014,071,012
7497 :189,251,103,205,242,071,110
7503 :176,003,076,114,029,174,139
7509 :014,071,189,251,103,205,150
7515 :242,071,208,013,238,014,109
7521 :071,173,242,071,201,000,087
7527 :240,009,076,061,029,162,168
7533 :001,142,090,072,096,162,160
7539 :000,142,090,072,096,032,035
7545 :032,030,032,032,030,160,181
7551 :000,140,180,002,162,001,100
7557 :032,198,255,032,207,255,088
7563 :172,180,002,153,164,069,111
7569 :238,180,002,032,195,029,053
7575 :173,088,072,201,064,208,189
7581 :234,160,000,140,180,002,105
7587 :032,102,027,096,032,032,228

7593	:030,032,032,030,162,001,200	8013	:069,032,176,025,173,242,026
7599	:032,201,255,160,000,185,240	8019	:071,201,020,208,035,174,024
7605	:164,069,032,210,255,200,087	8025	:014,071,224,005,176,239,050
7611	:192,084,208,245,032,102,026	8031	:174,014,071,169,000,157,168
7617	:027,096,032,183,255,041,059	8037	:049,072,206,023,070,174,183
7623	:064,141,088,072,096,032,180	8043	:023,070,169,000,157,251,009
7629	:183,255,041,002,141,088,147	8049	:103,238,014,071,032,189,248
7635	:072,096,162,000,142,213,128	8055	:022,076,078,031,201,013,028
7641	:064,142,214,064,142,181,000	8061	:240,048,201,048,144,203,241
7647	:002,138,174,181,002,157,109	8067	:201,058,176,199,032,189,218
7653	:167,002,238,181,002,174,225	8073	:022,206,014,071,174,014,126
7659	:181,002,224,014,144,240,016	8079	:071,224,255,240,021,174,104
7665	:173,001,072,041,015,201,232	8085	:014,071,173,242,071,157,109
7671	:001,240,008,032,178,023,217	8091	:049,072,174,023,070,157,188
7677	:104,104,076,149,010,162,090	8097	:251,103,238,023,070,076,154
7683	:001,142,181,002,174,181,172	8103	:078,031,032,240,037,076,149
7689	:002,189,001,072,201,000,218	8109	:146,030,032,189,022,174,254
7695	:240,011,041,015,157,167,134	8115	:014,071,224,005,208,011,200
7701	:002,238,181,002,076,007,015	8121	:162,000,142,246,103,142,212
7707	:030,032,201,027,096,162,063	8127	:247,103,076,225,032,174,024
7713	:015,032,201,255,160,000,184	8133	:014,071,224,000,208,060,006
7719	:140,180,002,172,180,002,203	8139	:173,053,072,201,054,144,132
7725	:185,211,064,032,210,255,234	8145	:053,240,003,076,169,031,013
7731	:160,004,204,180,002,240,073	8151	:173,052,072,201,053,144,142
7737	:006,238,180,002,076,042,089	8157	:041,240,003,076,169,031,013
7743	:030,160,000,140,180,002,063	8163	:173,051,072,201,053,144,153
7749	:032,102,027,096,238,161,213	8169	:029,240,003,076,169,031,013
7755	:069,174,161,069,189,049,018	8175	:173,050,072,201,051,144,162
7761	:072,041,015,133,253,141,224	8181	:017,240,003,076,169,031,013
7767	:242,071,096,169,000,141,038	8187	:173,049,072,201,053,144,175
7773	:014,071,174,014,071,157,082	8193	:005,240,003,076,169,031,013
7779	:033,071,238,014,071,174,188	8199	:032,241,028,174,090,072,132
7785	:014,071,224,013,208,240,107	8205	:224,000,240,011,032,240,248
7791	:096,162,000,138,157,001,153	8211	:037,162,000,142,090,072,010
7797	:072,232,224,047,208,248,124	8217	:076,146,030,238,161,069,233
7803	:096,169,001,162,008,160,207	8223	:174,161,069,189,049,072,233
7809	:002,032,186,255,169,005,010	8229	:201,000,240,243,041,015,009
7815	:162,041,160,063,032,189,014	8235	:141,056,072,174,161,069,204
7821	:255,032,192,255,096,169,116	8241	:224,004,240,084,238,161,232
7827	:092,141,043,025,169,064,169	8247	:069,174,161,069,189,049,254
7833	:141,044,025,032,034,025,198	8253	:072,041,015,010,141,054,138
7839	:032,048,046,032,004,038,103	8259	:072,010,010,024,109,056,092
7845	:032,176,025,032,189,022,129	8265	:072,109,054,072,141,056,065
7851	:173,242,071,201,049,240,123	8271	:072,174,161,069,224,004,015
7857	:034,162,001,142,105,072,181	8277	:240,050,032,073,030,032,030
7863	:169,137,141,043,025,169,099	8283	:159,056,174,161,069,224,166
7869	:064,141,044,025,032,034,017	8289	:004,240,037,032,073,030,001
7875	:025,169,033,141,043,025,119	8295	:032,201,056,032,220,056,188
7881	:169,064,141,044,025,032,164	8301	:174,161,069,224,004,240,213
7887	:034,025,076,225,030,169,254	8307	:021,032,073,030,162,010,187
7893	:017,141,043,025,169,064,160	8313	:142,025,070,032,201,056,135
7899	:141,044,025,032,034,025,008	8319	:206,025,070,174,025,070,185
7905	:169,224,141,043,025,169,228	8325	:224,000,208,243,173,199,156
7911	:103,141,044,025,032,034,098	8331	:103,205,057,072,144,018,226
7917	:025,169,062,141,043,025,190	8337	:240,003,076,169,031,173,069
7923	:169,064,141,044,025,032,206	8343	:198,103,205,056,072,144,161
7929	:034,025,169,230,141,043,123	8349	:005,240,003,076,169,031,169
7935	:025,169,103,141,044,025,250	8355	:056,173,056,072,237,198,187
7941	:032,034,025,169,013,032,054	8361	:103,141,246,103,173,057,224
7947	:048,046,032,048,046,169,144	8367	:072,237,199,103,141,247,150
7953	:067,141,043,025,169,064,014	8373	:103,024,169,115,109,247,180
7959	:141,044,025,032,034,025,068	8379	:103,141,005,104,173,246,191
7965	:162,000,134,253,134,254,198	8385	:103,141,004,104,024,173,230
7971	:142,023,070,142,056,072,028	8391	:246,103,141,002,104,173,200
7977	:142,057,072,142,014,071,027	8397	:247,103,141,003,104,014,049
7983	:174,014,071,169,000,157,120	8403	:002,104,046,003,104,024,238
7989	:251,103,238,014,071,174,136	8409	:169,104,109,003,104,141,079
7995	:014,071,224,006,144,238,244	8415	:003,104,032,091,038,032,011
8001	:032,064,038,162,005,142,252	8421	:048,046,169,220,141,043,128
8007	:014,071,162,255,142,161,108	8427	:025,169,064,141,044,025,191

8433 :032,034,025,169,251,141,125
8439 :043,025,169,103,141,044,004
8445 :025,032,034,025,032,048,193
8451 :046,032,237,054,169,068,097
8457 :133,251,173,003,104,133,038
8463 :252,172,002,104,140,161,078
8469 :069,177,251,141,213,064,168
8475 :032,130,038,172,161,069,117
8481 :177,251,141,214,064,032,144
8487 :237,054,169,252,133,251,111
8493 :173,005,104,133,252,172,116
8499 :004,104,140,161,069,177,194
8505 :251,141,094,072,032,238,117
8511 :045,174,010,070,224,000,074
8517 :240,080,169,161,133,251,079
8523 :141,143,029,169,072,133,250
8529 :252,141,144,029,032,120,031
8535 :029,172,094,072,169,255,110
8541 :145,251,032,032,030,032,103
8547 :032,030,032,204,255,162,046
8553 :001,032,201,255,160,000,242
8559 :140,161,069,172,161,069,115
8565 :177,251,032,210,255,032,050
8571 :130,038,174,161,069,224,151
8577 :253,144,238,169,001,032,198
8583 :195,255,032,037,046,162,094
8589 :000,142,010,070,032,095,234
8595 :024,076,154,033,032,105,059
8601 :034,169,140,141,043,025,193
8607 :169,065,141,044,025,032,123
8613 :034,025,032,004,038,032,074
8619 :101,022,173,242,071,201,213
8625 :082,240,004,201,114,208,002
8631 :011,162,000,142,105,072,163
8637 :032,188,028,076,146,030,177
8643 :201,077,240,004,201,109,003
8649 :208,008,162,000,142,105,058
8655 :072,076,228,011,201,063,090
8661 :208,019,032,188,028,169,089
8667 :077,141,043,025,169,065,227
8673 :141,044,025,032,034,025,014
8679 :076,154,033,201,013,240,180
8685 :066,174,023,071,224,000,027
8691 :208,050,201,075,208,046,007
8697 :162,001,142,010,070,162,028
8703 :000,142,161,069,142,014,015
8709 :071,162,004,142,023,070,221
8715 :174,023,070,189,251,103,053
8721 :172,014,071,153,049,072,036
8727 :238,014,071,206,023,070,133
8733 :174,014,071,224,004,208,212
8739 :231,076,061,033,032,188,144
8745 :028,032,240,037,076,154,096
8751 :033,032,107,056,032,241,036
8757 :028,174,090,072,224,000,129
8763 :240,011,032,240,037,162,013
8769 :000,142,090,072,076,146,079
8775 :030,032,032,037,032,188,166
8781 :028,174,196,103,236,246,036
8787 :103,176,016,174,247,103,134
8793 :236,197,103,144,008,162,171
8799 :000,142,105,072,076,146,124
8805 :030,076,182,032,162,000,071
8811 :142,108,072,142,115,072,246
8817 :142,236,071,142,103,072,111
8823 :032,032,030,032,032,030,051
8829 :032,233,022,173,242,071,130
8835 :141,012,071,162,001,236,242
8841 :108,072,208,003,076,201,037
8847 :035,174,115,072,236,094,101

8853 :072,176,006,238,115,072,060
8859 :076,125,034,162,001,142,183
8865 :108,072,173,012,071,141,226
8871 :103,072,032,173,037,173,245
8877 :012,071,201,255,208,019,171
8883 :169,230,141,043,025,169,188
8889 :066,141,044,025,032,034,015
8895 :025,032,048,046,076,184,090
8901 :036,032,233,022,173,242,167
8907 :071,141,012,071,174,105,009
8913 :072,224,000,208,027,174,146
8919 :023,071,224,000,240,008,013
8925 :169,007,141,242,071,032,115
8931 :244,036,173,012,071,141,136
8937 :242,071,141,250,080,076,069
8943 :017,035,032,233,022,173,239
8949 :242,071,201,000,240,246,221
8955 :032,173,037,032,233,022,012
8961 :173,242,071,201,000,240,160
8967 :246,032,173,037,032,091,106
8973 :038,076,195,035,174,023,042
8979 :071,224,000,240,003,032,077
8985 :244,036,173,242,071,201,224
8991 :048,208,014,173,024,208,194
8997 :041,253,141,024,208,032,224
9003 :173,037,076,059,035,173,084
9009 :024,208,009,002,141,024,201
9015 :208,032,173,037,032,233,002
9021 :022,173,242,071,174,102,077
9027 :072,224,022,208,017,173,015
9033 :242,071,041,015,201,008,139
9039 :176,003,076,089,035,169,115
9045 :049,141,242,071,174,023,017
9051 :071,224,000,240,006,173,037
9057 :242,071,032,244,036,173,127
9063 :242,071,041,015,141,032,133
9069 :208,032,173,037,032,233,056
9075 :022,173,242,071,201,000,056
9081 :240,246,174,102,072,224,155
9087 :022,208,017,173,242,071,092
9093 :041,015,201,008,176,003,065
9099 :076,147,035,169,049,141,244
9105 :242,071,174,023,071,224,182
9111 :000,240,006,173,242,071,115
9117 :032,244,036,173,242,071,187
9123 :041,015,141,033,208,032,121
9129 :173,037,173,250,080,201,059
9135 :048,208,017,173,103,072,028
9141 :201,019,208,010,173,102,126
9147 :072,201,022,208,003,076,001
9153 :193,036,032,013,038,076,069
9159 :125,034,173,242,071,201,021
9165 :026,208,006,032,173,037,175
9171 :076,184,036,173,242,071,225
9177 :201,027,208,067,174,236,106
9183 :071,224,000,208,017,032,007
9189 :048,046,032,030,038,162,073
9195 :001,142,236,071,032,173,122
9201 :037,076,125,034,032,048,081
9207 :046,174,236,071,224,001,231
9213 :240,021,162,000,142,236,030
9219 :071,032,173,037,174,105,083
9225 :072,224,000,208,003,076,080
9231 :125,034,076,184,036,032,246
9237 :047,038,238,236,071,032,171
9243 :173,037,076,125,034,162,122
9249 :000,142,000,070,173,242,148
9255 :071,201,018,208,008,162,195
9261 :001,142,255,069,076,169,245
9267 :036,201,146,208,008,162,044


```

9273 :000,142,255,069,076,169,000
9279 :036,173,242,071,201,013,031
9285 :208,036,174,255,069,224,011
9291 :000,240,021,169,146,141,024
9297 :242,071,032,189,022,169,038
9303 :013,141,242,071,032,189,007
9309 :022,169,018,141,242,071,244
9315 :162,000,142,000,070,076,037
9321 :169,036,174,102,072,224,114
9327 :022,208,035,173,242,071,094
9333 :201,022,208,008,169,000,213
9339 :141,242,071,076,169,036,090
9345 :201,129,240,008,201,149,033
9351 :144,032,201,156,176,028,104
9357 :169,144,141,242,071,076,216
9363 :169,036,173,242,071,201,015
9369 :022,208,013,169,013,141,207
9375 :242,071,162,001,142,000,009
9381 :070,076,071,036,173,242,065
9387 :071,141,012,071,032,189,175
9393 :022,032,173,037,076,125,130
9399 :034,032,204,255,169,001,110
9405 :032,195,255,096,169,039,207
9411 :141,043,025,169,065,141,011
9417 :044,025,032,034,025,032,137
9423 :204,045,174,237,071,224,138
9429 :001,208,011,165,078,141,049
9435 :242,071,032,189,022,076,083
9441 :184,036,165,089,141,242,058
9447 :071,032,189,022,173,012,218
9453 :071,141,242,071,076,195,009
9459 :035,032,204,255,174,023,198
9465 :071,224,000,208,009,173,166
9471 :242,071,032,210,255,076,117
9477 :028,037,162,002,032,201,211
9483 :255,173,242,071,032,210,226
9489 :255,032,204,029,174,088,031
9495 :072,224,000,208,216,032,007
9501 :204,255,096,238,246,103,147
9507 :174,246,103,224,000,208,222
9513 :003,238,247,103,096,169,129
9519 :000,141,015,071,174,015,207
9525 :071,157,019,072,238,015,113
9531 :071,174,015,071,224,026,128
9537 :144,240,096,032,046,037,148
9543 :169,212,141,043,025,169,062
9549 :065,141,044,025,032,034,162
9555 :025,032,004,038,162,000,088
9561 :142,015,071,032,016,023,132
9567 :173,242,071,201,013,208,235
9573 :008,169,027,141,242,071,247
9579 :076,138,037,201,020,208,019
9585 :024,174,015,071,224,000,109
9591 :240,227,032,189,022,206,011
9597 :015,071,174,015,071,169,128
9603 :000,157,019,072,076,092,035
9609 :037,032,189,022,174,015,094
9615 :071,173,242,071,157,019,108
9621 :072,201,027,240,013,238,172
9627 :015,071,174,015,071,224,213
9633 :026,176,003,076,092,037,059
9639 :162,001,142,004,070,096,130
9645 :238,094,072,174,094,072,149
9651 :224,253,208,056,162,000,058
9657 :142,094,072,032,204,255,216
9663 :238,213,064,174,213,064,133
9669 :224,000,208,003,238,214,060
9675 :064,174,214,064,224,001,176
9681 :208,017,174,213,064,224,085
9687 :145,144,010,162,001,142,051

```

```

9693 :213,064,162,000,142,214,248
9699 :064,032,032,030,032,032,193
9705 :030,162,001,032,198,255,143
9711 :096,032,048,046,169,204,066
9717 :141,043,025,169,064,141,060
9723 :044,025,032,034,025,032,187
9729 :218,023,096,169,062,141,198
9735 :242,071,032,189,022,096,147
9741 :032,091,038,169,020,141,248
9747 :043,025,169,065,141,044,250
9753 :025,032,034,025,096,032,013

```

MLX

(Article on page 175.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

MLX—64 Version

```

10 REM LINES CHANGED FROM MLX VERSION 2.0
   0 ARE 750,765,770 AND 860           :rem 50
20 REM LINE CHANGED FROM MLX VERSION 2.01
   IS 300                               :rem 147
100 PRINT"[CLR]{6}";CHR$(142);CHR$(8);:PO
    KE53281,1:POKE53280,1               :rem 67
101 POKE 788,52:REM DISABLE RUN/STOP
                                           :rem 119
110 PRINT"[RVS]{39 SPACES}";           :rem 176
120 PRINT"[RVS]{14 SPACES}{RIGHT}{OFF}{*}
    £{RVS}{RIGHT}{RIGHT}{2 SPACES}{*}
    {OFF}{*}£{RVS}£{RVS}{14 SPACES}";
                                           :rem 250
130 PRINT"[RVS]{14 SPACES}{RIGHT}{G}
    {RIGHT}{2 RIGHT}{OFF}£{RVS}£{*}
    {OFF}{*}{RVS}{14 SPACES}";       :rem 35
140 PRINT"[RVS]{41 SPACES}"           :rem 120
200 PRINT"{2 DOWN}{PUR}{BLK} MACHINE LANG
    UAGE EDITOR VERSION 2.02{5 DOWN}"
                                           :rem 238
210 PRINT"[5]{2 UP}STARTING ADDRESS?
    {8 SPACES}{9 LEFT}";             :rem 143
215 INPUTS:F=1-F:C$=CHR$(31+119*F)
                                           :rem 166
220 IFS<256OR(S>40960ANDS<49152)ORS>53247
    THENGOSUB3000:GOTO210             :rem 235
225 PRINT:PRINT:PRINT                 :rem 180
230 PRINT"[5]{2 UP}ENDING ADDRESS?
    {8 SPACES}{9 LEFT}";:INPUTE:F=1-F:C$=
    CHR$(31+119*F)                   :rem 20
240 IFE<256OR(E>40960ANDE<49152)ORE>53247
    THENGOSUB3000:GOTO230             :rem 183
250 IFE<STHENPRINTC$;"{RVS}ENDING < START
    {2 SPACES}":GOSUB1000:GOTO 230
                                           :rem 176
260 PRINT:PRINT:PRINT                 :rem 179
300 PRINT"[CLR]";CHR$(14):AD=S       :rem 56
310 A=1:PRINTRIGHT$("0000"+MID$(STR$(AD),
    2),5);":":                       :rem 33
315 FORJ=ATO6                         :rem 33
320 GOSUB570:IFN=-1THENJ=J+N:GOTO320
                                           :rem 228

```



```

390 IFN=-211 THEN 710 :rem 62
400 IFN=-204 THEN 790 :rem 64
410 IFN=-206 THEN PRINT:INPUT "{DOWN}ENTER N
EW ADDRESS";ZZ :rem 44
415 IFN=-206 THEN IFZZ<SORZZ> E THEN PRINT"
{RVS}OUT OF RANGE":GOSUB1000:GOTO410
:rem 225
417 IFN=-206 THEN AD=ZZ:PRINT:GOTO310
:rem 238
420 IF N<>-196 THEN 480 :rem 133
430 PRINT:INPUT "DISPLAY:FROM";F:PRINT,"TO
";:INPUTT :rem 234
440 IFF<SORF>EORT<SORT> E THEN PRINT"AT LEAS
T";S;{"LEFT}, NOT MORE THAN";E:GOTO43
0 :rem 159
450 FORI=FTOTSTEP6:PRINT:PRINTRIGHT$("000
0"+MID$(STR$(I),2),5);":": :rem 30
451 FORK=0TO5:N=PEEK(I+K):PRINTRIGHT$("00
"+MID$(STR$(N),2),3);":": :rem 66
460 GETAS:IFAS>" THEN PRINT:PRINT:GOTO310
:rem 25
470 NEXTK:PRINTCHR$(20);:NEXTI:PRINT:PRIN
T:GOTO310 :rem 50
480 IFN<0 THEN PRINT:GOTO310 :rem 168
490 A(J)=N:NEXTJ :rem 199
500 CKSUM=AD-INT(AD/256)*256:FORI=1TO6:CK
SUM=(CKSUM+A(I))AND255:NEXT :rem 200
510 PRINTCHR$(18);:GOSUB570:PRINTCHR$(146
); :rem 94
511 IFN=-1 THEN A=6:GOTO315 :rem 254
515 PRINTCHR$(20):IFN=CKSUM THEN 530
:rem 122
520 PRINT:PRINT"LINE ENTERED WRONG : RE-E
NTER":PRINT:GOSUB1000:GOTO310:rem 176
530 GOSUB2000 :rem 218
540 FORI=1TO6:POKEAD+I-1,A(I):NEXT:POKE54
272,0:POKE54273,0 :rem 227
550 AD=AD+6:IF AD<E THEN 310 :rem 212
560 GOTO 710 :rem 108
570 N=0:Z=0 :rem 88
580 PRINT"["; :rem 81
581 GETAS:IFAS="" THEN 581 :rem 95
582 AV=- (AS="M")-2*(AS=",")-3*(AS=".")-4*
(AS="J")-5*(AS="K")-6*(AS="L"):rem 41
583 AV=AV-7*(AS="U")-8*(AS="I")-9*(AS="O"
):IFAS="H" THEN AS="" :rem 134
584 IFAV>0 THEN AS=CHR$(48+AV) :rem 134
585 PRINTCHR$(20);:A=ASC(AS):IFA=13ORA=44
ORA=32 THEN 670 :rem 229
590 IFA>128 THEN --A:RETURN :rem 137
600 IFA<>20 THEN 630 :rem 10
610 GOSUB690:IFI=1ANDT=44 THEN --1:PRINT"
{OFF}{LEFT}{LEFT}";:GOTO690 :rem 62
620 GOTO570 :rem 109
630 IFA<48ORA>57 THEN 580 :rem 105
640 PRINTA;:N=N*10+A-48 :rem 106
650 IFN>255 THEN A=20:GOSUB1000:GOTO600
:rem 229
660 Z=Z+1:IFZ<3 THEN 580 :rem 71
670 IFZ=0 THEN GOSUB1000:GOTO570 :rem 114
680 PRINT",";:RETURN :rem 240
690 S%=PEEK(209)+256*PEEK(210)+PEEK(211)
:rem 149
691 FORI=1TO3:T=PEEK(S%-I) :rem 67
695 IFT<>44ANDT<>58 THEN POKES%-I,32:NEXT
:rem 205
700 PRINTLEFT$(" {3 LEFT}",I-1);:RETURN
:rem 7
710 PRINT"{CLR}{RVS}*** SAVE ***{3 DOWN}"
:rem 236
715 PRINT"{2 DOWN}(PRESS {RVS}RETURN{OFF})
ALONE TO CANCEL SAVE){DOWN}":rem 106
720 FS="" :INPUT "{DOWN} FILENAME";FS:IFFS=
"" THEN PRINT:PRINT:GOTO310 :rem 71
730 PRINT:PRINT"{2 DOWN}{RVS}T{OFF}APE OR
{RVS}D{OFF}ISK: (T/D)" :rem 228
740 GETAS:IFAS<>"T"ANDAS<>"D" THEN 740
:rem 36
750 DV=1-7*(AS="D"):IFDV=8 THEN FS="" :+FS:
OPEN15,8,15,"S"+FS:CLOSE15 :rem 212
760 T$=F$:ZK=PEEK(53)+256*PEEK(54)-LEN(T$
):POKE782,ZK/256 :rem 3
762 POKE781,ZK-PEEK(782)*256:POKE780,LEN(
T$):SYS65469 :rem 109
763 POKE780,1:POKE781,DV:POKE782,1:SYS654
66 :rem 69
765 K=S:POKE254,K/256:POKE253,K-PEEK(254)
*256:POKE780,253 :rem 17
766 K=E+1:POKE782,K/256:POKE781,K-PEEK(78
2)*256:SYS65496 :rem 235
770 IF(PEEK(783)AND1)OR(191ANDST) THEN 780
:rem 111
775 PRINT"{DOWN}DONE.{DOWN}":GOTO310
:rem 113
780 PRINT"{DOWN}ERROR ON SAVE.{2 SPACES}T
RY AGAIN.":IFDV=1 THEN 720 :rem 171
781 OPEN15,8,15:INPUT#15,E1$,E2$:PRINT E1$
;E2$:CLOSE15:GOTO720 :rem 103
790 PRINT"{CLR}{RVS}*** LOAD ***{2 DOWN}"
:rem 212
795 PRINT"{2 DOWN}(PRESS {RVS}RETURN{OFF})
ALONE TO CANCEL LOAD)" :rem 82
800 FS="" :INPUT "{2 DOWN} FILENAME";FS:IFF
S="" THEN PRINT:GOTO310 :rem 144
810 PRINT:PRINT"{2 DOWN}{RVS}T{OFF}APE OR
{RVS}D{OFF}ISK: (T/D)" :rem 227
820 GETAS:IFAS<>"T"ANDAS<>"D" THEN 820
:rem 34
830 DV=1-7*(AS="D"):IFDV=8 THEN FS="" :+FS
:rem 157
840 T$=F$:ZK=PEEK(53)+256*PEEK(54)-LEN(T$
):POKE782,ZK/256 :rem 2
841 POKE781,ZK-PEEK(782)*256:POKE780,LEN(
T$):SYS65469 :rem 107
845 POKE780,1:POKE781,DV:POKE782,1:SYS654
66 :rem 70
850 POKE780,0:SYS65493 :rem 11
860 IF(PEEK(783)AND1)OR(191ANDST) THEN 870
:rem 111
865 PRINT"{DOWN}DONE.":GOTO310 :rem 96
870 PRINT"{DOWN}ERROR ON LOAD.{2 SPACES}T
RY AGAIN.{DOWN}":IFDV=1 THEN 800
:rem 172
880 OPEN15,8,15:INPUT#15,E1$,E2$:PRINT E1$
;E2$:CLOSE15:GOTO800 :rem 102
1000 REM BUZZER :rem 135
1001 POKE54296,15:POKE54277,45:POKE54278,
165 :rem 207
1002 POKE54276,33:POKE 54273,6:POKE54272,
5 :rem 42
1003 FORT=1TO200:NEXT:POKE54276,32:POKE54
273,0:POKE54272,0:RETURN :rem 202
2000 REM BELL SOUND :rem 78
2001 POKE54296,15:POKE54277,0:POKE54278,2
47 :rem 152
2002 POKE 54276,17:POKE54273,40:POKE54272
,0 :rem 86
2003 FORT=1TO100:NEXT:POKE54276,16:RETURN
:rem 57
3000 PRINTCS;"{RVS}NOT ZERO PAGE OR ROM":
GOTO1000 :rem 89

```


Cosmic Combat

(Article on page 92.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

Program 1: Cosmic Combat—VIC Loader

```
1 POKE36879,105:POKE56,28:POKE52,28:PRINT
  "{CLR}{WHT}" :rem 166
2 FORT=7168TO7271:READN:POKET,N:NEXT
  :rem 72
3 FORT=7424TO7431:POKET,0:NEXT :rem 128
4 DATA24,24,24,24,189,255,255,129,129,153
  ,189,231,255,189,153,129 :rem 208
5 DATA0,238,136,232,40,238,0,255 :rem 78
6 DATA0,238,170,174,172,234,0,255,0,228,1
  30,239,130,228,0,224 :rem 218
7 DATA0,234,138,238,42,234,0,255,0,187,17
  0,187,160,163,0,255 :rem 183
8 DATA0,136,4,190,132,136,0,128,8,8,8,8
  ,8,8,8 :rem 57
9 DATA128,64,32,16,8,4,2,1,1,2,4,8,16,32,
  64,128 :rem 39
10 DATA0,0,0,255,0,0,0,0,0,255,0,255,0,25
  5,0,255,0 :rem 135
11 DATA127,99,99,99,103,103,103,127,12,12
  ,12,12,28,28,28,28 :rem 138
12 DATA127,3,3,127,96,96,96,127,126,6,6,1
  26,7,7,7,127 :rem 111
13 DATA96,102,102,127,6,6,6,6,127,96,96,1
  27,3,3,3,127 :rem 94
14 DATA127,96,96,127,99,99,99,127,127,3,3
  ,7,14,12,12,12 :rem 218
15 DATA63,35,35,63,99,99,99,127,127,99,99
  ,127,3,3,3,127 :rem 241
16 FORT=7551TO7631:READC:POKET,C:NEXT
  :rem 99
17 PRINT"{WHT} NOW LOADING PART II":FORT=
  1TO4:PRINT:NEXT :rem 243
19 S$="LO"+CHR$(34)+"CC"+CHR$(34)+" ,8:"+C
  HR$(131) :rem 89
20 REM CHANGE ,8 TO ,1 IN LINE 19 IF USIN
  G TAPE :rem 184
21 FORI=1TOLEN(S$):POKE630+I,ASC(MID$(S$,
  I)):NEXT:POKE198,I:END :rem 90
```

Program 2: Cosmic Combat—VIC Main Program

```
1 MT$="ATTACK FORCE":GOTO93 :rem 125
2 POKEZ+CL,.:POKEZ,32:Z=FNF(SL)+SK+Z:POKE
  Z+CL,2:POKEZ,1:RETURN :rem 33
3 POKECL+EL,2:POKEEL,1:POKECL+EL,2:POKEE1
  ,1:POKECL+ET,2:POKEET,1:POKEL+CL,5:POKE
  L,.:rem 237
4 RETURN :rem 20
5 M=CL+T:POKEM-23,7:POKET-23,9:POKEM+23,7
  :POKET+23,9:POKEM-21,7:POKET-21,10
  :rem 10
6 POKEM+21,7:POKET+21,10:POKEM-22,7:POKET
  -22,8:POKEM+22,7:POKET+22,8:RETURN
  :rem 73
```

```
7 DIMJS(2,2):POKE37139,0:DD=37154:PA=3713
  7:PB=37152:CL=30720:FQ=36877:CM=36869:S
  B=36879 :rem 201
8 FORI=0TO2:FORJ=0TO2:READJS(J,I):NEXTJ,I
  :DATA-1,0,1,-1,0,1,-1,0,1 :rem 131
9 POKECM,255:POKEDD,127:POKESB,8:S1=36876
  :V=36878:S2=36874 :rem 199
10 DEFFNF(T)=INT(RND(1)*T)+1:DEFFNK(T)=PE
  EK(EL)+PEEK(ET)+PEEK(E1) :rem 138
11 DEFFNX(T)=((PAND16)=T)-((PEEK(PB)AND12
  8)=.):DEFFNY(T)=-((PAND32)=T) :rem 44
13 PRINT"{CLR}{2 RIGHT}BCD"SC"{HOME}"TAB(
  13)"EFG"2-DE:L=8130:K=L:C=L:POKECL+L,5
  :POKEL,.:rem 196
14 POKEV,15:FORT=1TO812:NEXT :rem 22
15 EL=7728:POKECL+EL,2:POKEEL,1:E1=7734:P
  OKEE1+CL,2:POKEE1,1:ET=7741:POKECL+ET,
  2 :rem 103
16 POKEET,1:A=A+3 :rem 227
17 P=PEEK(PA):X=FNX(.):FR=FN(.):IFX=.GOT
  O23 :rem 219
19 K=K+X:IFK=8119ORX=8142GOTO23 :rem 122
21 L=L+X:POKEL+CL,5:POKEL,.:POKEC+CL,.:PO
  KEC,32:C=L :rem 157
23 K=L:POKES1,.:IFFR=.THENIFW=.GOTO29
  :rem 112
25 IFW=1THENPOKES1,.:FORT=FTOF-330STEP-22
  :POKET+CL,.:POKET,32:NEXT:W=.:GOTO29
  :rem 218
27 IFW=.THENF=L-22:POKES1,198:FORT=FTOF-3
  30STEP-22:POKET+CL,6:POKET,8:NEXT:W=1
  :rem 231
29 IFFNK(>3GOTO43 :rem 105
31 IFQ=1GOTO39 :rem 87
33 IFQ=2GOTO49 :rem 91
35 Z=EL:GOSUB2:EL=Z:IFEL>8120THENED=EL:GO
  TO69 :rem 169
37 Q=1:GOTO17 :rem 4
39 Z=E1:GOSUB2:E1=Z:IFEL>8120THENED=E1:GO
  TO69 :rem 65
41 Q=2:GOTO17 :rem 0
43 IFPEEK(EL)>1THENED=EL:GOTO53 :rem 205
45 IFPEEK(E1)>1THENED=E1:GOTO53 :rem 153
47 IFPEEK(ET)>1THENED=ET:GOTO53 :rem 225
49 Z=ET:GOSUB2:ET=Z:IFET>8120THENED=ET:GO
  TO69 :rem 206
51 Q=.:GOTO17 :rem 253
53 T=ED:POKET+CL,2:POKET,1:GOSUB5:POKECL+
  T-1,7:POKET-1,11:POKECL+T+1,7:POKET+1,
  11 :rem 30
55 FORT=250TO150STEP-3:POKES1,T:NEXT:POKE
  S1,.:IFXM=.THENIFSC>5000THENDE=DE-1:XM
  =1 :rem 212
57 SC=SC+100:HE=HE+100:IFHE>2000THENKK=KK
  +1:HE=.:GOSUB107 :rem 172
59 A=A+1:IFA>24THENA=.:GOTO87 :rem 244
61 IFEL=EDTHENEL=FNF(7)+7727 :rem 174
63 IFEL=EDTHENEL=FNF(7)+7734 :rem 120
65 IFET=EDTHENET=FNF(14)+7727 :rem 240
67 PRINT"{CLR}{2 RIGHT}BCD"SC"{HOME}"TAB(
  13)"EFG"2-DE:GOSUB3:GOTO17 :rem 19
69 FORT=-3TO3:IFT+ED>8119ANDT+ED<8142THEN
  POKECL+T+ED,3:POKET+ED,12 :rem 100
71 NEXT:POKES1,.:IFSC>.THENSC=SC-20:HE=HE
  -20 :rem 0
73 POKEFQ,150:FORN=15TO3STEP-2:POKEV,N:FO
  RT=1TO99:NEXTT,N:POKEFQ,.:POKEV,15
  :rem 152
75 IFL>ED-4ANDL<ED+4GOTO79 :rem 91
77 GOTO61 :rem 14
79 DE=DE+1:T=L:GOSUB5 :rem 33
```



```

81 POKES2,235:FORT=1TO863:NEXT:POKES2,228
   :FORT=1TO1245:NEXT           :rem 4
83 POKES2,.:IFDE=3THENGOTO103   :rem 55
85 GOTO13                         :rem 10
87 AW=AW+1                       :rem 56
89 POKESB,105:PRINT"{CLR}":POKECM,240
   :rem 80
91 LG=LEN(STR$(AW))+LEN(MT$):GL=LG/2:PRIN
   T"{CLR}{9 DOWN}"TAB(11-GL)MT$AW
   :rem 108
92 FORT=1TO2687:NEXT:POKECM,255:POKESB,8:
   GOTO 13                       :rem 1
93 POKE36879,105:PRINT"{CLR}{WHT}"TAB(92)
   "COSMIC COMBAT"SPC(98)"SKILL LEVEL"SPC
   (34)"1-2-3-4-5"             :rem 212
95 FORT=7724TO7742:POKET,32:POKET+88,32:P
   OKET+3,160:POKET+91,160:GETK$:IFK$<>"
   GOTO99                       :rem 133
97 NEXT:FORT=7745TO7727STEP-1:POKET,32:PO
   KET+88,32:POKET-3,160:POKET+85,160:NEX
   T:GOTO95                     :rem 213
99 KK=VAL(K$):IFKK=0ORKK>5THENNEXT
   :rem 204
101 GOSUB107:PRINT"{CLR}":GOTO7  :rem 242
103 POKEDD,255:FORT=1TO2647:NEXT:POKECM,2
   40:PRINT"{CLR}"SPC(94)"GAME OVER
   :rem 90
105 FORT=1TO2647:NEXT:CLR:GOTO93  :rem 40
107 IFKK<3THENSK=21-KK:SL=(KK*2)+1:rem 17
109 IFKK=3THENSK=42:SL=3         :rem 232
111 IFKK=4THENSK=41:SL=5       :rem 227
113 IFKK>4THENSK=64:SL=3      :rem 233
115 RETURN                     :rem 119

```

```

49344 :208,008,169,001,141,014,221
49350 :192,076,203,192,096,173,106
49356 :016,208,041,001,208,011,177
49362 :173,016,208,041,239,141,004
49368 :016,208,076,229,192,173,086
49374 :016,208,009,016,141,016,116
49380 :208,173,001,208,233,022,049
49386 :141,009,208,173,000,208,205
49392 :141,008,208,169,001,141,140
49398 :014,192,076,023,193,169,145
49404 :033,141,004,212,174,073,121
49410 :192,202,142,073,192,142,177
49416 :001,212,173,009,208,056,155
49422 :233,002,141,009,208,201,040
49428 :030,144,017,173,030,208,110
49434 :141,003,192,041,016,240,147
49440 :006,032,068,193,076,040,191
49446 :193,096,169,196,141,252,061
49452 :007,169,200,141,073,192,058
49458 :169,000,141,001,212,141,202
49464 :000,212,141,009,208,141,255
49470 :008,208,141,014,192,096,209
49476 :173,003,192,041,014,141,120
49482 :003,192,032,128,193,208,062
49488 :001,096,141,008,192,010,016
49494 :141,010,192,172,008,192,033
49500 :169,197,145,251,160,015,005
49506 :032,152,193,032,003,197,195
49512 :173,003,192,073,255,045,077
49518 :016,208,141,016,208,172,103
49524 :008,192,152,024,105,192,021
49530 :145,251,032,161,193,096,232

```

```

49536 :201,002,208,003,169,001,200
49542 :096,201,004,208,003,169,047
49548 :002,096,201,008,208,003,146
49554 :169,003,096,169,000,096,167
49560 :162,255,202,208,253,136,088
49566 :208,248,096,160,001,177,024
49572 :253,105,005,145,253,201,102
49578 :010,144,019,056,233,010,130
49584 :145,253,200,192,007,240,189
49590 :009,177,253,105,001,145,104
49596 :253,076,169,193,173,022,050
49602 :192,105,048,141,017,004,189
49608 :173,023,192,105,048,141,114
49614 :016,004,141,016,004,173,048
49620 :024,192,105,048,141,015,225
49626 :004,173,025,192,105,048,253
49632 :141,014,004,173,026,192,006
49638 :105,048,141,013,004,096,125
49644 :032,003,194,009,030,141,133
49650 :011,192,032,003,194,041,203
49656 :031,141,012,192,096,032,240
49662 :003,194,041,003,096,169,248
49668 :255,141,015,212,169,128,156
49674 :141,018,212,173,027,212,025
49680 :096,032,001,196,172,027,028
49686 :192,136,032,003,194,041,108
49692 :031,201,031,208,014,032,033
49698 :003,194,024,105,001,041,146
49704 :003,170,202,138,153,074,012
49710 :192,185,074,192,141,077,139
49716 :192,173,027,192,010,141,019
49722 :010,192,168,173,077,192,102
49728 :201,001,240,007,201,002,204
49734 :240,055,076,174,194,177,218
49740 :247,056,233,001,170,144,159
49746 :003,076,102,194,145,247,081

```

Program 3:

Cosmic Combat—64 Version

Requires MLX (see instructions in article).

```

49152 :076,086,196,000,015,015,132
49158 :001,000,000,000,000,000,007
49164 :000,004,000,001,024,060,101
49170 :000,015,001,254,000,000,032
49176 :000,000,000,000,083,067,174
49182 :079,082,069,032,058,032,126
49188 :000,083,072,073,080,083,171
49194 :032,058,032,000,065,084,057
49200 :084,065,067,075,032,032,147
49206 :000,000,000,032,032,032,150
49212 :032,032,032,032,032,032,252
49218 :032,032,032,032,032,032,002
49224 :000,000,000,000,000,000,072
49230 :173,000,220,041,015,201,216
49236 :015,240,008,201,011,240,031
49242 :007,201,007,240,045,076,154
49248 :182,192,173,000,208,056,139
49254 :233,001,144,003,076,118,165
49260 :192,141,000,208,206,016,103
49266 :208,076,182,192,170,173,091
49272 :016,208,041,001,240,003,117
49278 :142,000,208,236,016,192,152
49284 :144,048,142,000,208,076,238
49290 :182,192,173,000,208,024,149
49296 :105,001,176,003,076,160,153
49302 :192,141,000,208,238,016,177
49308 :208,076,182,192,170,173,133
49314 :016,208,041,001,208,006,130
49320 :142,000,208,076,182,192,200
49326 :236,017,192,176,003,142,172
49332 :000,208,173,014,192,208,207
49338 :015,173,000,220,041,016,139

```


49752 :173,018,192,073,255,045,076
 49758 :016,208,141,016,208,076,247
 49764 :174,194,173,016,208,045,142
 49770 :018,192,240,006,138,145,077
 49776 :247,076,174,194,236,016,031
 49782 :192,144,053,138,145,247,013
 49788 :076,174,194,177,247,024,248
 49794 :105,001,170,176,003,076,149
 49800 :152,194,145,247,173,016,039
 49806 :208,013,018,192,141,016,218
 49812 :208,076,174,194,173,016,221
 49818 :208,045,018,192,208,006,063
 49824 :138,145,247,076,174,194,110
 49830 :236,017,192,176,003,138,160
 49836 :145,247,177,249,024,105,095
 49842 :001,145,249,201,230,144,124
 49848 :003,076,059,195,177,249,175
 49854 :201,060,176,001,096,173,129
 49860 :030,208,041,015,208,001,187
 49866 :096,141,003,192,041,001,164
 49872 :240,004,032,059,195,096,066
 49878 :173,003,192,041,002,240,097
 49884 :005,169,001,032,251,194,104
 49890 :173,003,192,041,004,240,111
 49896 :005,169,002,032,251,194,117
 49902 :173,003,192,041,008,240,127
 49908 :005,169,003,032,251,194,130
 49914 :096,141,008,192,010,141,070
 49920 :010,192,172,008,192,169,231
 49926 :197,145,251,169,129,141,014
 49932 :011,212,160,020,032,152,087
 49938 :193,169,128,141,011,212,104
 49944 :160,020,032,152,193,032,101
 49950 :003,197,169,001,174,008,070
 49956 :192,010,202,208,252,073,205
 49962 :255,045,016,208,141,016,211
 49968 :208,173,008,192,168,024,053
 49974 :105,192,145,251,096,172,247
 49980 :027,192,169,199,145,251,019
 49986 :169,129,141,011,212,152,112
 49992 :010,168,177,247,056,233,195
 49998 :012,145,247,176,011,173,074
 50004 :018,192,073,255,045,016,171
 50010 :208,141,016,208,173,018,086
 50016 :192,141,029,208,160,020,078
 50022 :032,152,193,173,030,208,122
 50028 :041,001,240,003,032,157,070
 50034 :195,160,030,032,152,193,108
 50040 :169,128,141,011,212,032,045
 50046 :003,197,169,255,077,018,077
 50052 :192,045,016,208,141,016,238
 50058 :208,172,027,192,152,024,145
 50064 :105,192,145,251,032,032,133
 50070 :196,169,000,141,029,208,125
 50076 :096,169,000,141,014,192,000
 50082 :141,001,212,141,000,212,101
 50088 :141,004,212,141,008,208,114
 50094 :141,009,208,169,017,045,251
 50100 :021,208,141,021,208,169,180
 50106 :198,141,248,007,160,255,171
 50112 :032,152,193,169,000,141,111
 50118 :021,208,141,016,208,169,193
 50124 :180,141,000,208,169,230,108
 50130 :141,001,208,169,192,141,038
 50136 :248,007,032,235,195,032,197
 50142 :014,196,173,013,192,240,026
 50148 :005,169,031,141,021,208,035
 50154 :096,160,002,032,236,193,185
 50160 :173,012,192,145,249,173,160
 50166 :011,192,145,247,200,200,217
 50172 :192,008,208,237,096,169,138
 50178 :001,174,027,192,010,202,096
 50184 :208,252,141,018,192,096,147
 50190 :206,013,192,173,013,192,035
 50196 :024,105,048,141,034,004,120
 50202 :169,001,141,034,216,096,171
 50208 :032,063,196,173,003,192,179
 50214 :208,014,160,001,177,253,083
 50220 :240,009,170,202,138,145,180
 50226 :253,032,192,193,096,169,217
 50232 :009,145,253,200,076,042,013
 50238 :196,160,001,177,253,208,033
 50244 :011,200,192,006,208,247,164
 50250 :169,001,141,003,192,096,164
 50256 :169,000,141,003,192,096,169
 50262 :032,035,197,173,141,002,154
 50268 :208,251,238,027,192,173,157
 50274 :027,192,201,004,208,005,223
 50280 :169,001,141,027,192,032,154
 50286 :078,192,173,014,192,240,231
 50292 :008,032,251,192,173,004,008
 50298 :192,240,019,032,023,197,057
 50304 :032,017,194,173,004,192,228
 50310 :048,008,173,013,192,208,008
 50316 :204,076,232,200,169,000,253
 50322 :141,009,208,141,008,208,093
 50328 :141,004,212,141,011,212,105
 50334 :141,000,212,141,001,212,097
 50340 :169,001,141,003,192,032,190
 50346 :165,200,206,007,192,206,122
 50352 :007,192,206,007,192,169,181
 50358 :000,141,014,192,141,073,231
 50364 :192,141,021,208,141,027,150
 50370 :192,160,060,032,152,193,215
 50376 :173,005,192,024,105,003,190
 50382 :141,004,192,141,005,192,113
 50388 :238,006,192,032,235,195,086
 50394 :169,180,141,000,208,169,061
 50400 :230,141,001,208,169,254,203
 50406 :045,016,208,141,016,208,096
 50412 :169,031,141,021,208,169,207
 50418 :010,160,020,032,152,193,041
 50424 :170,202,138,208,246,032,220
 50430 :044,200,076,089,196,032,123
 50436 :236,193,172,010,192,173,212
 50442 :012,192,145,249,173,011,024
 50448 :192,145,247,206,004,192,234
 50454 :096,174,007,192,160,007,146
 50460 :136,208,253,202,208,248,003
 50466 :096,169,000,141,030,208,166
 50472 :141,004,212,141,011,212,249
 50478 :141,022,192,141,023,192,245
 50484 :141,024,192,141,025,192,255
 50490 :141,026,192,141,056,192,038
 50496 :141,055,192,141,007,212,044
 50502 :141,032,208,141,033,208,065
 50508 :133,247,032,203,199,169,035
 50514 :006,141,037,208,169,009,140
 50520 :141,038,208,169,230,141,247
 50526 :013,208,141,015,208,160,071
 50532 :000,169,001,153,000,216,127
 50538 :200,192,006,208,248,160,096
 50544 :000,169,192,153,248,007,113
 50550 :024,105,001,200,192,009,137
 50556 :208,245,169,031,141,028,178
 50562 :208,141,021,208,169,180,033

50568 :141,000,208,169,230,141,001
50574 :001,208,169,075,141,007,231
50580 :192,169,004,141,013,192,091
50586 :169,032,141,004,192,141,065
50592 :005,192,169,007,141,039,201
50598 :208,169,002,141,040,208,166
50604 :169,004,141,041,208,169,136
50610 :005,141,042,208,169,007,238
50616 :141,043,208,169,048,141,166
50622 :018,004,169,017,141,005,032
50628 :212,169,241,141,006,212,153
50634 :169,200,141,001,212,141,042
50640 :000,212,169,015,141,024,001
50646 :212,169,031,141,012,212,223
50652 :169,250,141,013,212,169,150
50658 :015,141,008,212,032,235,101
50664 :195,169,255,141,073,192,233
50670 :169,001,141,044,208,169,202
50676 :208,133,248,169,001,133,112
50682 :249,169,208,133,250,169,148
50688 :248,133,251,169,007,133,173
50694 :252,169,021,133,253,169,235
50700 :192,133,254,032,048,198,101
50706 :032,104,198,032,044,200,116
50712 :032,014,196,096,169,001,020
50718 :141,000,216,141,001,216,233
50724 :141,002,216,141,003,216,243
50730 :141,004,216,141,005,216,253
50736 :169,147,032,210,255,024,117
50742 :160,005,162,000,032,240,141
50748 :255,169,028,160,192,032,128
50754 :030,171,024,160,026,162,127
50760 :000,032,240,255,169,037,037
50766 :160,192,032,030,171,169,064
50772 :048,141,017,004,141,016,195
50778 :004,141,015,004,141,014,153
50784 :004,141,013,004,141,018,161
50790 :004,096,169,005,133,105,102
50796 :169,216,133,106,160,000,124
50802 :169,001,145,105,200,192,158
50808 :030,208,249,169,240,133,125
50814 :105,160,000,169,001,145,194
50820 :105,200,192,012,208,249,074
50826 :096,000,000,000,000,032,010
50832 :000,000,032,000,000,032,208
50838 :000,000,032,000,000,032,214
50844 :000,000,032,000,004,084,020
50850 :064,004,084,064,004,084,210
50856 :064,006,086,064,010,086,228
50862 :128,042,086,160,012,000,090
50868 :192,063,003,240,255,207,116
50874 :252,000,000,000,000,000,182
50880 :000,000,000,000,000,000,192
50886 :000,000,000,000,000,063,005
50892 :251,255,014,170,172,015,057
50898 :170,188,003,234,240,000,021
50904 :234,192,000,234,192,000,044
50910 :251,192,021,123,085,005,131
50916 :123,084,001,123,080,000,127
50922 :059,000,000,063,000,000,100
50928 :008,000,000,008,000,000,000
50934 :008,000,000,000,000,000,254
50940 :000,000,000,000,000,000,252
50946 :000,000,000,000,000,000,002
50952 :000,000,000,000,000,000,008
50958 :000,000,000,000,000,000,014
50964 :000,016,000,000,016,000,052
50970 :000,016,000,000,016,000,058

50976 :000,016,000,000,016,000,064
50982 :000,016,000,000,016,000,070
50988 :000,016,000,000,016,000,076
50994 :000,016,000,000,016,000,082
51000 :000,016,000,000,016,000,088
51006 :000,000,000,000,000,000,062
51012 :000,000,000,000,000,000,068
51018 :000,064,000,001,016,000,155
51024 :004,016,000,004,004,000,108
51030 :016,001,000,064,001,000,168
51036 :064,000,065,000,000,065,030
51042 :000,000,000,000,000,020,118
51048 :000,085,020,085,000,020,058
51054 :000,000,000,000,000,065,175
51060 :000,000,065,000,001,000,182
51066 :064,001,000,064,004,000,255
51072 :016,016,000,004,016,000,180
51078 :004,064,000,001,000,000,203
51084 :000,000,000,000,000,000,140
51090 :004,000,001,005,064,005,225
51096 :004,080,001,021,080,017,099
51102 :016,000,001,005,017,065,006
51108 :021,081,080,004,081,016,191
51114 :021,004,081,069,005,016,110
51120 :016,020,005,017,016,001,251
51126 :017,000,000,001,000,000,200
51132 :020,000,000,069,000,000,021
51138 :020,000,000,000,000,000,214
51144 :000,000,000,160,063,185,096
51150 :139,198,153,000,048,136,112
51156 :016,247,160,063,185,203,062
51162 :198,153,064,048,153,128,194
51168 :048,153,192,048,136,016,049
51174 :241,160,063,185,011,199,065
51180 :153,000,049,136,016,247,069
51186 :160,063,185,075,199,153,053
51192 :064,049,136,016,247,160,152
51198 :063,185,139,199,153,128,097
51204 :049,136,016,247,162,003,105
51210 :160,000,169,170,032,036,065
51216 :200,169,000,162,003,032,070
51222 :036,200,192,064,176,007,185
51228 :162,003,169,170,076,014,110
51234 :200,096,153,192,049,200,156
51240 :202,208,249,096,024,160,211
51246 :015,162,010,032,240,255,248
51252 :169,046,160,192,032,030,169
51258 :171,032,083,200,160,255,191
51264 :032,152,193,024,160,015,128
51270 :162,010,032,240,255,169,170
51276 :057,160,192,032,030,171,206
51282 :096,173,055,192,024,105,215
51288 :001,201,010,144,005,238,175
51294 :056,192,169,000,141,055,195
51300 :192,173,056,192,024,105,074
51306 :048,141,167,005,173,055,183
51312 :192,024,105,048,141,168,022
51318 :005,169,001,141,167,217,050
51324 :141,168,217,160,200,032,018
51330 :152,193,096,152,160,002,117
51336 :032,152,193,168,173,003,089
51342 :192,009,000,141,003,192,167
51348 :177,249,201,030,144,010,191
51354 :170,202,138,145,249,169,203
51360 :001,141,003,192,096,173,254
51366 :003,192,208,001,096,169,067
51372 :000,141,003,192,160,002,158
51378 :032,133,200,200,200,032,207

51384 :133,200,200,200,032,133,058
 51390 :200,076,165,200,071,065,199
 51396 :077,069,032,079,086,069,096
 51402 :082,000,080,082,069,083,086
 51408 :083,032,084,082,073,071,121
 51414 :071,069,082,032,084,079,119
 51420 :032,080,076,065,089,032,082
 51426 :065,071,065,073,078,000,066
 51432 :169,000,141,021,208,024,027
 51438 :160,015,162,010,032,240,089
 51444 :255,169,194,160,200,032,230
 51450 :030,171,024,160,006,162,035
 51456 :013,032,240,255,169,204,145
 51462 :160,200,032,030,171,173,004
 51468 :000,220,041,016,208,249,234
 51474 :076,086,196,013,013,013,159

320 POKE 38884,2:POKE 8164,78:POKE 38888,
 2:POKE 8168,77 :rem 188
 330 PRINT "{BLK}{HOME}{DOWN}{8 RIGHT}DIFF
 ICULTY" :rem 246
 340 PRINT "{8 RIGHT}LEVEL:" :rem 2
 350 PRINT "{DOWN}{11 RIGHT}";10-DL:rem 18
 360 PRINT "{DOWN}{8 RIGHT}LETTERS" :rem 134
 370 PRINT "{8 RIGHT}REMAINING:" :rem 39
 380 PRINT "{DOWN}{11 RIGHT}";LR :rem 149
 390 PRINT "{DOWN}{8 RIGHT}SCORE:" :rem 28
 400 PRINT "{3 DOWN}{8 RIGHT}HIGH SCORE:" :rem 86
 410 PRINT "{DOWN}{11 RIGHT}";HS :rem 140
 420 IF BT<>9999 THEN POKE BT+30718,4:POKE
 BT-2,62 :rem 141
 470 FOR I=38402 TO 38886 STEP 22 :rem 93
 480 POKE I,6 :rem 118
 490 NEXT I :rem 37
 500 LE=INT(RND(1)*26+1):LC=LE+64 :rem 31
 510 FOR J=1 TO 26 :rem 64
 520 POKE B,J :rem 126
 530 FORT=1TO20:NEXT :rem 191
 540 NEXT J :rem 34
 550 FOR I=1 TO LE :rem 108
 560 POKE B,I :rem 129
 570 NEXT I :rem 36
 580 POKE B,32:A\$="":CN=0:POKE V,15:POKE 19
 8,0 :rem 175
 590 FOR I=7704 TO 8166 STEP 22 :rem 245
 600 POKE S,220-CN :rem 150
 610 POKE I,LE :rem 204
 620 FOR J=1 TO DL :rem 106
 630 IF A\$="" THEN GET A\$:rem 130
 640 NEXT J :rem 35
 650 IF A\$="" THEN 680 :rem 221
 660 IF ASC(A\$)=LC THEN 820 :rem 77
 670 A\$="" :rem 131
 680 POKE I,32 :rem 167
 690 CN=CN+3 :rem 92
 700 NEXT I :rem 31
 710 POKE S,0:POKE V,0 :rem 145
 720 FORT=1TO100:NEXT :rem 239
 730 LR=LR-1 :rem 113
 740 PRINT "{HOME}{9 DOWN}{11 RIGHT}
 {6 SPACES}" :rem 87
 750 PRINT "{HOME}{9 DOWN}{11 RIGHT}";LR :rem 49
 760 IF LR=0 THEN 1010 :rem 40
 770 GOTO 500 :rem 108
 780 REM :rem 131
 820 POKE I+30722,5:POKE I+2,31:POKE S,0:P
 OKE V,0:POKE V,15:POKE N,175 :rem 63
 830 FOR K=1 TO 30 :rem 65
 840 POKE I,81 :rem 169
 850 FORT=1TO20:NEXT :rem 196
 860 POKE I,87 :rem 177
 870 FORT=1TO20:NEXT :rem 198
 880 NEXT K :rem 42
 890 POKE I,32:POKE N,0:POKE V,0 :rem 216
 900 IF I<BT THEN BT=I :rem 142
 910 TM=TM+(I-7682)/22:SC=SC+1:LR=LR-1 :rem 133
 920 PRINT "{HOME}{9 DOWN}{11 RIGHT}
 {6 SPACES}" :rem 87
 930 PRINT "{HOME}{9 DOWN}{11 RIGHT}";LR :rem 49
 940 PRINT "{3 DOWN}{11 RIGHT}";SC:rem 177
 950 IF LR=0 THEN 1010 :rem 41
 960 GOTO 500 :rem 109
 1010 FORT=1TO750:NEXT :rem 35

Letter Attack

(Article on page 70.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

Program 1: Letter Attack—VIC Version

10 POKE36879,26 :rem 53
 20 HS=0:BT=9999:V=36878:S=36875:N=36877:A
 =30720:B=7682 :rem 39
 30 PRINT "{CLR}{10 DOWN}{4 RIGHT}LETTER A
 TTACK!" :rem 142
 50 FORT=1TO1500:NEXT :rem 240
 100 PRINT "{CLR}":SC=0:TM=0:POKE 198,0
 :rem 225
 110 PRINT "{5 DOWN}{2 SPACES}CHOOSE DIFFI
 CULTY" :rem 108
 120 PRINT "{DOWN}{4 SPACES}LEVEL ({RVS}1
 {OFF} - {RVS}9{OFF})" :rem 29
 130 DL\$="":GET DL\$:IF DL\$="" THEN 130 :rem 88
 150 IF DL\$<"1" OR DL\$>"9" THEN 130:rem 93
 160 DL=VAL(DL\$):DL=10-DL:POKE 198,0
 :rem 216
 170 PRINT "{2 DOWN}{2 SPACES}HOW MANY LET
 TERS" :rem 209
 180 PRINT "{DOWN}{2 SPACES}WOULD YOU LIKE
 ?" :rem 103
 190 PRINT "{DOWN}{6 SPACES}{RVS}1{OFF}0 -
 {RVS}9{OFF}0" :rem 187
 200 NL\$="":GET NL\$:IF NL\$="" THEN 200 :rem 114
 210 PRINT NL\$:rem 222
 220 IF NL\$<"1" OR NL\$>"9" THEN 200 :rem 109
 230 NL=VAL(NL\$):NL=NL*10:LR=NL :rem 67
 270 PRINT "{CLR}" :rem 253
 280 POKE 38400,2:POKE 7680,77:POKE 38404,
 2:POKE 7684,78 :rem 165
 290 FOR I=7703 TO 8143 STEP 22 :rem 236
 300 POKE I+A,2:POKE I,101:POKE I+A+2,2:PO
 KE I+2,103 :rem 237
 310 NEXT I :rem 28


```

1020 PRINT "{CLR}{2 DOWN}SCORE:";SC :rem 2
      :rem 208
1030 IF SC>HS THEN HS=SC :rem 95
1040 PRINT "{2 DOWN}HIGH SCORE:";HS :rem 100
1050 PRINT "{2 DOWN}HIGHEST POSSIBLE" :rem 38
1060 PRINT "SCORE:";NL :rem 35
1070 ER=(SC/NL)*100 :rem 7
1080 PRINT "{2 DOWN}EFFICIENCY" :rem 145
1090 PRINT "RATING:";ER;"%" :rem 16
1100 IF SC=0 THEN AT=0:GOTO 1120 :rem 188
1110 AT=INT(TM/SC) :rem 55
1120 PRINT "{2 DOWN}AVERAGE TIME:";AT :rem 235
1130 PRINT "({RVS}1{OFF} - GOOD {RVS}22 :rem 14
      {OFF} -BAD)"
1140 PRINT "{2 DOWN}WOULD YOU LIKE TO" :rem 9
1150 PRINT "PLAY AGAIN? (Y OR N)" :rem 6
1160 POKE 198,0 :rem 245
1170 A$="":GET A$:IF A$="" THEN 1170 :rem 213
1180 IF A$="Y" THEN 100 :rem 88
1185 IFA$<>"N"THEN1170 :rem 199
1190 PRINT "{CLR}":END :rem 64

```

Program 2: Letter Attack—64 Version

```

10 POKE53280,2:POKE 53281,1 :rem 185
20 HS=0:BT=9999:V=54296:S=54273:N=128:A=5 :rem 120
  4272:B=1027:TAB$="{10 RIGHT}"
22 FOR I=ATO+24:POKEI,0:NEXT :rem 14
25 POKE 54277,100:POKE 54278,100 :rem 140
30 PRINT "{CLR}{10 DOWN}{13 RIGHT}LETTER :rem 147
  {SPACE}ATTACK!"
50 FORT=1TO1000:NEXT :rem 235
100 PRINT "{CLR}":SC=0:TM=0:POKE 198,0 :rem 225
110 PRINT "{4 DOWN}"TAB$"CHOOSE DIFFICULT :rem 154
  Y"
120 PRINT TAB$"LEVEL ({RVS}1{OFF} - {RVS} :rem 7
  9{OFF})"
130 DL$="":GET DL$:IF DL$="" THEN 130 :rem 88
140 IF DL$<"1" OR DL$>"9" THEN 130:rem 92
150 PRINT TAB$ DL$ :rem 210
160 DL=VAL(DL$):DL=10-DL:POKE 198,0 :rem 216
170 PRINT TAB$"{2 DOWN}HOW MANY LETTERS" :rem 204
180 PRINT TAB$"WOULD YOU LIKE?" :rem 81
190 PRINT TAB$"{DOWN}{RVS}1{OFF}0 - {RVS} :rem 182
  9{OFF}0"
200 NL$="":GET NL$:IF NL$="" THEN 200 :rem 114
210 IF NL$<"1" OR NL$>"9" THEN 200 :rem 108
220 PRINT NL$ :rem 223
230 NL=VAL(NL$):NL=NL*10:LR=NL :rem 67
270 PRINT "{CLR}" :rem 253
280 POKE 55296,2:POKE 1024,77:POKE 55302, :rem 138
  2:POKE 1030,78
290 FOR I=1065 TO 1945 STEP 40 :rem 234
300 POKE I+A,2:POKE I,101:POKE I+A+4,2:PO :rem 241
  KE I+4,103
310 NEXT I :rem 28
320 POKE 56256,2:POKE 1984,78:POKE 56262, :rem 166
  2:POKE 1990,77
330 PRINT "{BLK}{HOME}{DOWN}{8 RIGHT}DIFF :rem 246
  ICULTY"
340 PRINT "{8 RIGHT}LEVEL:" :rem 2
350 PRINT "{DOWN}{11 RIGHT}";10-DL:rem 18
360 PRINT "{DOWN}{8 RIGHT}LETTERS" :rem 134
370 PRINT "{8 RIGHT}REMAINING:" :rem 39
380 PRINT "{DOWN}{11 RIGHT}";LR :rem 149
390 PRINT "{DOWN}{8 RIGHT}SCORE:" :rem 28
400 PRINT "{3 DOWN}{8 RIGHT}HIGH SCORE:" :rem 86
410 PRINT "{DOWN}{11 RIGHT}";HS :rem 140
420 IF BT<>9999 THEN POKE BT+54269,4:POKE :rem 149
  BT-3,62
470 FOR I=55299 TO 56259 STEP 40 :rem 100
480 POKE I,6 :rem 118
490 NEXT I :rem 37
500 LE=INT(RND(1)*26+1):LC=LE+64 :rem 31
510 FOR J=1 TO 26 :rem 64
520 POKE B,J :rem 126
530 FORT=1TO20:NEXT :rem 191
540 NEXT J :rem 34
550 FOR I=1 TO LE :rem 108
560 POKE B,I :rem 129
570 NEXT I :rem 36
580 POKE B,32:A$="":CN=0:POKEV,15:POKE 19 :rem 175
  8,0
585 POKE 54276,17 :rem 109
590 FOR I=1027 TO 1988 STEP 40 :rem 242
600 POKE S,220-CN :rem 150
610 POKE I,LE :rem 204
620 FOR J=1 TO DL :rem 106
630 IF A$="" THEN GET A$ :rem 130
640 NEXT J :rem 35
650 IF A$="" THEN 680 :rem 221
660 IF ASC(A$)=LC THEN 820 :rem 77
670 A$="" :rem 131
680 POKE I,32 :rem 167
690 CN=CN+3 :rem 92
700 NEXT I :rem 31
710 POKE 54276,16 :rem 98
720 FORT=1TO100:NEXT :rem 239
730 LR=LR-1 :rem 113
740 PRINT "{HOME}{9 DOWN}{11 RIGHT} :rem 87
  {6 SPACES}"
750 PRINT "{HOME}{9 DOWN}{11 RIGHT}";LR :rem 49
760 IF LR=0 THEN 1010 :rem 40
770 GOTO 500 :rem 108
820 POKE I+A+3,5:POKE I+3,31:POKE S,20:PO :rem 177
  KE V,15:POKE 54276,129
830 FOR K=1 TO 30 :rem 65
840 POKE I,81 :rem 169
850 FORT=1TO20:NEXT :rem 196
860 POKE I,87 :rem 177
870 FORT=1TO20:NEXT :rem 198
880 NEXT K :rem 42
890 POKE I,32:POKE 54276,128 :rem 226
900 IF I<BT THEN BT=I :rem 142
910 TM=TM+(I-1026)/40:SC=SC+1:LR=LR-1 :rem 119
920 PRINT "{HOME}{9 DOWN}{11 RIGHT} :rem 87
  {6 SPACES}"
930 PRINT "{HOME}{9 DOWN}{11 RIGHT}";LR :rem 49
940 PRINT "{3 DOWN}{11 RIGHT}";SC:rem 177
950 IF LR=0 THEN 1010 :rem 41
960 GOTO 500 :rem 109
1010 FORT=1TO750:NEXT :rem 35
1020 PRINT "{CLR}{2 DOWN}"TAB$"SCORE:";SC :rem 15
1030 IF SC>HS THEN HS=SC :rem 95
1040 PRINT TAB$"{2 DOWN}HIGH SCORE:";HS :rem 95

```



```

1050 PRINT TAB$"{2 DOWN}HIGHEST POSSIBLE"
      :rem 33
1060 PRINT TAB$"SCORE:";NL
      :rem 30
1070 ER=(SC/NL)*100
      :rem 7
1080 PRINT TAB$"{2 DOWN}EFFICIENCY"
      :rem 140
1090 PRINT TAB$"RATING:";ER;"%"
      :rem 11
1100 IF SC=0 THEN AT=0:GOTO 1120
1110 AT=INT(TM/SC)
      :rem 55
1120 PRINT TAB$"{2 DOWN}AVERAGE TIME:";AT
      :rem 230
1130 PRINT TAB$"({RVS}1{OFF} - GOOD {RVS}
22{OFF} -BAD)"
      :rem 9
1140 PRINT TAB$"{2 DOWN}WOULD YOU LIKE TO
"
      :rem 4
1150 PRINT TAB$"PLAY AGAIN? (Y OR N)"
      :rem 1
1160 POKE 198,0
      :rem 245
1170 A$="":GET A$:IF A$="" THEN
      :rem 213
1180 IF A$="Y" THEN 100
      :rem 88
1181 IFA$<>"N"THEN1170
      :rem 195
1190 PRINT"{CLR}":END
      :rem 64

```

Machine Language For Beginners

(Article on page 108.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

Program 2: 64 Easydir

```

830 JSR 979
833 JSR 65484
836 JSR 65484
839 LDX #1
841 JSR 65478
844 JSR 65508
847 JSR 65508
850 LDY #29
852 JSR 65508
855 JSR 65490
858 DEY
859 BNE 852
861 LDA #13
863 JSR 65490
866 JMP 896
869 JSR 959
872 JSR 65508
875 CMP #13
877 BEQ 935
879 CMP #34
881 BNE 872
883 JSR 65508
886 CMP #34
888 BEQ 896
890 JSR 65490
893 JMP 883
896 JSR 65508
899 BEQ 914

```

```

901 CMP #42
903 BNE 896
905 JSR 65490
908 JSR 65490
911 JMP 896
914 JSR 65508
917 JSR 65508
920 JSR 65508
923 STA 1013
926 JSR 65508
929 STA 1012
932 JMP 869
935 LDA #70
937 JSR 65490
940 LDA #82
942 JSR 65490
945 LDA #69
947 JSR 65490
950 LDA #1
952 JSR 65475
955 JSR 65484
958 RTS
959 LDA #32
961 JSR 65490
964 LDA 1012
967 LDX 1013
970 JSR 48589
973 LDA #45

```

```

975 JSR 65490
978 RTS
979 JSR 65484
982 LDA #1
984 STA 184
986 LDA #8
988 STA 186
990 LDA #0
992 STA 185
994 LDA #2

```

```

996 STA 183
998 LDA #242
1000 STA 167
1002 LDA #3
1004 STA 188
1006 JSR 57793
1009 RTS
1010 BIT 48
1012 BRK
1013 BRK

```

Program 2a: VIC Substitutions

```

970 JSR 56781
1006 JSR 57790

```

Program 3: BASIC Loader For Easydir

```

800 FOR ADRES=830TO1011:READ DATTA
810 POKE ADRES,DATTA:NEXT ADRES
830 DATA 32, 211, 3, 32, 204, 255
836 DATA 32, 204, 255, 162, 1, 32
842 DATA 198, 255, 32, 228, 255, 32
848 DATA 228, 255, 160, 29, 32, 228
854 DATA 255, 32, 210, 255, 136, 208
860 DATA 247, 169, 13, 32, 210, 255
866 DATA 76, 128, 3, 32, 191, 3
872 DATA 32, 228, 255, 201, 13, 240
878 DATA 56, 201, 34, 208, 245, 32
884 DATA 228, 255, 201, 34, 240, 6
890 DATA 32, 210, 255, 76, 115, 3
896 DATA 32, 228, 255, 240, 13, 201
902 DATA 42, 208, 247, 32, 210, 255
908 DATA 32, 210, 255, 76, 128, 3
914 DATA 32, 228, 255, 32, 228, 255
920 DATA 32, 228, 255, 141, 245, 3
926 DATA 32, 228, 255, 141, 244, 3
932 DATA 76, 101, 3, 169, 70, 32
938 DATA 210, 255, 169, 82, 32, 210
944 DATA 255, 169, 69, 32, 210, 255
950 DATA 169, 1, 32, 195, 255, 32
956 DATA 204, 255, 96, 169, 32, 32
962 DATA 210, 255, 173, 244, 3, 174
968 DATA 245, 3, 32, 205, 189, 169
974 DATA 45, 32, 210, 255, 96, 32
980 DATA 204, 255, 169, 1, 133, 184
986 DATA 169, 8, 133, 186, 169, 0
992 DATA 133, 185, 169, 2, 133, 183
998 DATA 169, 242, 133, 187, 169, 3
1004 DATA 133, 188, 32, 193, 225, 96
1010 DATA 36, 48

```

Program 3a: VIC Substitutions

```

968 DATA 245, 3, 32, 205, 221, 169
1004 DATA 133, 188, 32, 190, 225, 96

```

Program 4: Direct Machine Language Save Routine

```

10 REM MACHINE LANGUAGE SAVE TO DISK
20 OPEN1,8,1,"0:NAME"
30 INPUT "ML PROGRAM'S STARTING ADDRESS"
;SA
40 INPUT "ITS ENDING ADDRESS";EA:EA=EA+1
:POKE780,253
50 SH=SA/256:SH%=SH:S1=SH-SH%:SL%=S1*256
60 EH=EA/256:EH%=EH:E1=EH-EH%:EL%=E1*256
70 POKE253,SL%:POKE254,SH%:POKE781,EL%:P
OKE782,EH%:SYS 65496:CLOSE1

```


Auto Line

(Article on page 130.)

Program 1: Auto Line—64 Version

```
10 SA=49152:REM CHANGE STARTING ADDRESS T
  O RELOCATE :rem 95
20 FORI=SATOSA+103:READA:X=X+A:POKEI,A:NE
  XT :rem 27
30 SB=SA+29:POKESA+7,INT(SB/256):POKESA+2
  ,SB-INT(SB/256)*256 :rem 51
40 SC=SA+88:POKESA+23,INT(SC/256):POKESA+
  18,SC-INT(SC/256)*256 :rem 162
50 IFX<>11563THENPRINT"ERROR IN DATA STAT
  EMENTS.":STOP :rem 183
60 IN=10:POKESA+46,IN:REM INCREMENT CHANG
  E :rem 89
70 PRINT"{CLR}{RVS}SYS"STR$(SA)" TO RUN
  {OFF}":NEW :rem 112
80 DATA 120,169,29,141,2,3,169 :rem 195
90 DATA 192,141,3,3,169,0,133 :rem 138
100 DATA 20,133,21,169,88,141,20 :rem 23
110 DATA 3,169,192,141,21,3,88 :rem 191
120 DATA 96,173,21,3,201,234,208 :rem 27
130 DATA 6,32,138,255,76,131,164 :rem 38
140 DATA 165,20,24,105,10,133,99 :rem 27
150 DATA 165,21,105,0,133,98,162 :rem 30
160 DATA 144,56,32,73,188,32,221 :rem 39
170 DATA 189,162,0,189,1,1,240 :rem 191
180 DATA 6,157,119,2,232,208,245 :rem 39
190 DATA 169,32,157,119,2,232,134 :rem 90
200 DATA 198,76,131,164,32,225,255
  :rem 141
210 DATA 208,8,32,138,255,169,13 :rem 40
220 DATA 32,210,255,76,49,234 :rem 145
```

Program 2: Auto Line—VIC Version

Note: If using expansion memory, change line 10 as described in the article.

```
10 POKE56,30:POKE55,0:REM POINTERS TO NOR
  MAL TOP OF MEMORY ON VIC :rem 151
20 PRINT"{CLR}PLACE AT TOP MEMORY,":PRINT
  "OR IN CASSETTE BUFFER" :rem 17
30 INPUT"({RVS}T{OFF})/({RVS}C{OFF})":A$:IF
  A$<>"T"ANDA$<>"C"THEN30 :rem 65
40 IF A$="C" THEN SA=828:GOTO70 :rem 152
50 T=PEEK(55)+PEEK(56)*256:T=T-104:POKE56
  ,INT(T/256):POKE55,T-INT(T/256)*256:SA
  =T :rem 232
60 POKE52,INT(T/256):POKE51,T-INT(T/256)*
  256 :rem 35
70 FORI=SATOSA+103:READA:X=X+A:POKEI,A:NE
  XT :rem 32
80 SB=SA+29:POKESA+7,INT(SB/256):POKESA+2
  ,SB-INT(SB/256)*256 :rem 56
90 SC=SA+88:POKESA+23,INT(SC/256):POKESA+
  18,SC-INT(SC/256)*256 :rem 167
100 IF X<>11575 THEN PRINT"ERROR IN DATA
  {SPACE}STATEMENTS.":END :rem 119
110 IN=10:POKESA+46,IN:REM INCREMENT CHAN
  GE :rem 133
120 PRINT"{CLR}{RVS}SYS"STR$(SA)" TO RUN
  {OFF}":NEW :rem 156
130 DATA 120,169,89,141,2,3,169 :rem 245
140 DATA 3,141,3,3,169,0,133 :rem 77
```

```
150 DATA 20,133,21,169,148,141,20 :rem 73
160 DATA 3,169,3,141,21,3,88 :rem 91
170 DATA 96,173,21,3,201,234,208 :rem 32
180 DATA 6,32,138,255,76,131,196 :rem 48
190 DATA 165,20,24,105,10,133,99 :rem 32
200 DATA 165,21,105,0,133,98,162 :rem 26
210 DATA 144,56,32,73,220,32,221 :rem 22
220 DATA 221,162,0,189,1,1,240 :rem 174
230 DATA 6,157,119,2,232,208,245 :rem 35
240 DATA 169,32,157,119,2,232,134 :rem 86
250 DATA 198,76,131,196,32,225,255
  :rem 151
260 DATA 208,8,32,138,255,169,13 :rem 45
270 DATA 32,210,255,76,191,234 :rem 196
```

Power Basic

(Article on page 158.)

Program 1: Time Clock—VIC Version

```
10 PRINT"{CLR}{RVS}PLEASE WAIT" :rem 198
20 FORI=828TO1002:READA:X=X+A:POKEI,A:NEX
  T :rem 153
30 IF X<>21647 THEN PRINT"ERROR IN DATA S
  TATEMENTS.":END :rem 74
40 SYS828:FR=1004:Z1=1 :rem 12
50 PRINT"{CLR}{4 SPACES}{4 DOWN}CHOOSE:
  {DOWN}" :rem 25
60 PRINT"{4 SPACES}{RVS}{BLK}F1{OFF}{BLU}
  :STOP CLOCK" :rem 237
70 PRINT"{DOWN}{4 SPACES}{RVS}{BLK}F3
  {OFF}{BLU}:START CLOCK" :rem 73
80 PRINT"{DOWN}{4 SPACES}{RVS}{BLK}F5
  {OFF}{BLU}:CLEAR CLOCK" :rem 37
90 PRINT"{DOWN}{4 SPACES}{RVS}{BLK}F7
  {OFF}{BLU}:SET TIME" :rem 112
100 GETA$:IFA$<CHR$(133)ORA$>CHR$(136)THE
  N100 :rem 25
110 ON ASC(A$)-132 GOTO120,170,180,130
  :rem 148
120 POKEFR,Z1:GOTO100 :rem 21
130 POKEFR,Z1:INPUT"{CLR}{2 DOWN}HOURS? 0
  0{4 LEFT}":H$:IFLEN(H$)<>2THEN130
  :rem 244
140 INPUT"MINUTES? 00{4 LEFT}":M$:IF LEN(
  M$)<>2 THEN 140 :rem 39
150 INPUT"SECONDS? 00{4 LEFT}":S$:IF LEN(
  S$)<>2 THEN 150 :rem 31
160 T$=H$+M$+S$+"00":FORI=1TO8:POKE1005+I
  ,ASC(MID$(T$,I)):NEXT:GOTO50 :rem 252
170 POKEFR,.:GOTO100 :rem 189
180 POKEFR,Z1:SYS853:GOTO100 :rem 244
190 DATA 173,20,3,141,233,3,173 :rem 232
200 DATA 21,3,141,234,3,120,169 :rem 223
210 DATA 100,141,20,3,169,3,141 :rem 218
220 DATA 21,3,169,0,141,236,3 :rem 128
230 DATA 169,48,162,9,157,237,3 :rem 1
240 DATA 202,208,250,88,96,173,236
  :rem 146
250 DATA 3,208,53,162,8,24,189 :rem 199
260 DATA 237,3,105,1,141,235,3 :rem 179
270 DATA 201,58,208,5,169,48,141 :rem 44
280 DATA 235,3,138,41,1,240,12 :rem 180
290 DATA 173,235,3,201,54,208,5 :rem 240
300 DATA 169,48,141,235,3,173,235 :rem 89
```



```

310 DATA 3,157,237,3,202,240,7 :rem 182
320 DATA 201,48,208,249,76,107,3 :rem 39
330 DATA 173,238,3,201,50,208,15 :rem 27
340 DATA 173,239,3,201,52,208,8 :rem 241
350 DATA 169,48,141,238,3,141,239 :rem 96
360 DATA 3,162,8,160,12,169,9 :rem 146
370 DATA 133,253,133,251,173,136,2
      :rem 131
380 DATA 133,252,165,244,41,254,133
      :rem 186
390 DATA 254,173,134,2,145,253,189
      :rem 148
400 DATA 237,3,9,128,145,251,138 :rem 39
410 DATA 41,1,240,10,136,169,58 :rem 235
420 DATA 145,251,173,134,2,145,253
      :rem 131
430 DATA 136,202,208,225,76,49,234
      :rem 141

```

```

450 DATA 4,173,134,2,141,37,216 :rem 237
460 DATA 173,11,220,48,5,169,1 :rem 191
470 DATA 76,117,192,169,16,141,39 :rem 104
480 DATA 4,173,134,2,141,39,216 :rem 242
490 DATA 76,49,234,0,256 :rem 167
500 RETURN :rem 117

```

3-D Labyrinth

(Article on page 96.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

Program 2: Time Clock—64 Version

```

100 Y=PEEK(49269):IFY<>141THENGOSUB270
      :rem 37
110 POKE56335,0:PRINT"{CLR}{WHT}":INPUT"A
    M OR PM ({RVS}A{OFF})/{RVS}P{OFF}";A$
      :rem 153
120 IF A$<>"A" AND A$<>"P" THEN 110
      :rem 141
130 B=0:IF A$="P" THEN B=128 :rem 139
140 INPUT"{3 DOWN}TIME (HHMMSS FORMAT)";T
    $ :rem 104
150 IF LEN(T$)<>6 THEN 140 :rem 65
160 IF VAL(LEFT$(T$,2))>12 THEN 250
      :rem 55
170 IF VAL(MID$(T$,3,2))>59 OR VAL(MID$(T
    $,5,2))>59 THEN 250 :rem 88
180 FORA=1TO5STEP2:D=VAL(MID$(T$,A,1)):D=
    D*16+VAL(MID$(T$,A+1,1)) :rem 209
190 POKE49154-(A-1)/2,D:NEXTA :rem 120
200 IF LEFT$(T$,2)="12" THEN B=128-B
      :rem 51
210 POKE49154,PEEK(49154)AND127:POKE49154
    ,PEEK(49154)ORB :rem 219
220 PRINT"{3 DOWN}{6 SPACES}PRESS ANY KEY
    TO START CLOCK" :rem 147
230 GET A$:IF A$="" THEN 230 :rem 77
240 PRINT"{CLR}":SYS49155:END :rem 76
250 PRINT"{DOWN}ERROR IN INPUT.":FORI=1TO
    1000:NEXT:GOTO140 :rem 21
260 REM ML LOADER :rem 204
270 I=49155 :rem 39
280 READ A:IF A=256 THEN 300 :rem 157
290 POKE I,A:I=I+1:X=X+A:GOTO 280:rem 133
300 IF X<>13794 THEN PRINT"ERROR IN DATA
    {SPACE}STATEMENTS.":END :rem 126
310 DATA 162,3,189,255 :rem 60
320 DATA 191,157,8,220,202,208,247
      :rem 134
330 DATA 169,0,141,8,220,120,169 :rem 29
340 DATA 32,141,20,3,169,192,141 :rem 27
350 DATA 21,3,88,96,169,58,141 :rem 210
360 DATA 29,4,173,134,2,141,29 :rem 192
370 DATA 216,162,3,160,0,189,8 :rem 194
380 DATA 220,41,112,74,74,74,74 :rem 246
390 DATA 24,105,176,153,30,4,173 :rem 35
400 DATA 134,2,153,30,216,200,189 :rem 73
410 DATA 8,220,41,15,24,105,176 :rem 232
420 DATA 153,30,4,173,134,2,153 :rem 230
430 DATA 30,216,200,202,208,213,173
      :rem 166
440 DATA 8,220,24,105,176,141,37 :rem 32

```

```

1 X=PEEK(648)*256:SYS 65517:GP=PEEK(781):
  IFGP=40THENC$=CHR$(13) :rem 230
2 DIM M$(17,17):O$="{DOWN}[2 SPACES]{RVS}
  PRESS ANY KEY":IFGP<>40THENPOKE36879,11
  0 :rem 229
3 FORJ=1TO17:FOR I=2TO16:M$(I,J)=1:M$(17,
  J)=1:M$(I,17)=1:M$(I,1)=1:NEXTI,J
      :rem 172
4 FORI=3TO16STEP2:FORJ=3TO16STEP2:M$(I,J)
  =1:NEXTJ,I:AJ=0:Q$="N" :rem 177
5 FORK=1TO37:I=INT(RND(1)*15)+2:J=INT(RND
  (1)*15)+2:M$(I,J)=1:NEXT:Q=1:B=2:C=2
      :rem 244
6 FORI=1TO26:READW:READY:M$(W,Y)=0:NEXT:R
  ESTORE:TI$="000000":E=0:D=-1:AI=D
      :rem 62
7 POKE198,0:PRINT"{CLR}{WHT}"TAB(10)Q$:IF
  M$(B+E,C+D)=1THEN32 :rem 35
8 PRINT"{HOME}{DOWN}M{DOWN}M{DOWN}M
  {DOWN}M{DOWN}M{DOWN}M{DOWN}M{DOWN}M
  {DOWN}M{DOWN}M{DOWN}M{DOWN}M{DOWN}M
  {DOWN}M{DOWN}M{DOWN}M{DOWN}M{DOWN}M
  {DOWN}M{DOWN}M" :rem 116
9 PRINT"_{UP}N{UP}N{UP}N{UP}N{UP}N
  {UP}N{UP}N{UP}N{UP}N{UP}N{UP}N{UP}N
  INTTAB(13)"{UP}N{UP}N{UP}N{UP}N{UP}N
  {UP}N{UP}N{UP}N{HOME}" :rem 224
10 IF M$(B+AI,C+AJ)=0THENGOSUB58 :rem 88
11 IFM$(B-AI,C-AJ)=0THENGOSUB60 :rem 86
12 IFM$(B+2*E,C+2*D)=1THEN38 :rem 5
13 IFM$(B+2*E+AI,C+2*D+AJ)=0THENGOSUB52
      :rem 236
14 IFM$(B+2*E-AI,C+2*D-AJ)=0THENGOSUB54
      :rem 243
15 IFM$(B+3*E,C+3*D)=1THEN40 :rem 3
16 IFM$(B+4*E,C+4*D)=1THEN45 :rem 11
17 IFM$(B+4*E+AI,C+4*D+AJ)=0THENGOSUB56
      :rem 248
18 IFM$(B+4*E-AI,C+4*D-AJ)=0THENGOSUB57
      :rem 254
19 IFM$(B+5*E,C+5*D)=1THEN47 :rem 18
20 GOSUB48:GETQ$:IFQ$=""THEN20 :rem 45
21 IFQ$="Q"THENPRINT"{CLR}":ZS=1:GOSUB63:
  GOTO76 :rem 36
22 IFQ$="N"THENE=0:D=-1:AI=-1:AJ=0:GOTO7
      :rem 108
23 IFQ$="S"THENE=0:D=1:AI=1:AJ=0:GOTO7
      :rem 24
24 IFQ$="E"THENE=1:D=0:AI=0:AJ=-1:GOTO7
      :rem 56

```



```

70 FORI=0TOW-1:SAYT$(I):NEXT:FORI=0TOW-1:
  T$(I)="":NEXT:W=0:RETURN :rem 155
80 POKE49457,76:POKE49458,174:POKE49459,1
  67:REM AVERT ILLEGAL QTY ERROR:rem 224
90 FORK=1TO10:READC:C$(K)=CHR$(C):NEXT:RE
  M EDITING COMMANDS :rem 162
100 FORI=1TO40:READH$(I),EQ$(I):NEXT:REM
  HOMONYMS & EQUIVALENTS :rem 55
110 FORI=1TO3:READH1$(I):NEXT:FORI=1TO6:R
  EADE1$(I):NEXT:REM 2-PART EQUIVALENTS
  :rem 197
120 POKE53281,1:POKE53280,6:POKE53272,23:
  REM SCREEN COLORS & LOWERCASE:rem 103
130 PRINT"{CLR}{8 DOWN}{7 RIGHT}{RVS}
  {RED}{7 RIGHT}FINGER TALK{8 RIGHT}"
  :rem 19
140 PRINT"{5 DOWN}":INPUT"{12 RIGHT}{RVS}
  {GRN}RATE (1-10){RIGHT}{OFF}";RT$(
  :rem 197
150 RT=VAL(RT$):IFRT<1ORRT>10THEN130
  :rem 252
160 PRINT "{4 DOWN}{PUR}{9 RIGHT}SAY EACH
  LETTER (Y/N) ?" :rem 1
170 GETA$:IFA$="ORAS<>"Y"ANDAS<>"N"THEN1
  70 :rem 180
180 PL=-(A$="Y") :rem 47
190 GOSUB380 :rem 181
200 PRINT"{P}{LEFT}";:RATE(RT):RT=(RT=10)
  *10+RT:POKE1024,RT+48:POKE55296,0
  :rem 190
210 GETA$:IFA$="THEN210 :rem 73
220 IFPOS(0)>78THENA$=CHR$(13) :rem 202
230 PRINT "{LEFT}";:T=0:FORI=1TO10:IFA$=C
  $(I)THENT=I:I=10 :rem 171
240 NEXTI:IFT=3ORT=8THENPRINTC$(8):GOSUB3
  80 :rem 22
250 IFT=2ORT=4ORT=7THENPRINTA$;:IFT=4ANDL
  EN(K$)>0THENK$=MID$(K$,1,LEN(K$)-1)
  :rem 161
260 IFT<>0THEN200 :rem 230
270 IFA$=CHR$(133)THENRT=RT+1+(RT=10)*10:
  GOTO200 :rem 23
280 IFA$>CHR$(192)ANDAS<CHR$(218)THENPRIN
  TA$;:A$=CHR$(ASC(A$)-128):GOTO360
  :rem 6
290 IFA$<>CHR$(32)THEN320 :rem 132
300 IFK$=""THENPRINTA$;:GOTO200 :rem 115
310 GOSUB20:PRINTA$;:SAYK$:T$(W)=K$:K$=""
  :W=W+1:GOTO200 :rem 41
320 IFA$<>CHR$(13)THEN350 :rem 128
330 IFK$=""THENPRINTA$;:GOSUB70:GOTO200
  :rem 151
340 GOSUB20:T$(W)=K$:K$="" :W=W+1:PRINTA$;
  :GOSUB70:GOTO200 :rem 183
350 PRINTA$; :rem 197
360 K$=K$+A$:IFPL=1THEN:SAYA$ :rem 210
370 GOTO200 :rem 101
380 PRINT"{CLR}{RVS}{GRN}{4 SPACES}LET YO
  UR {RED} FINGERS {CYN} DO THE {RED} T
  ALKING {OFF}{WHT}{BLU}":RETURN
  :rem 150
390 DATA 17,18,19,20,29,145,146,147,148,1
  57 :rem 85
400 REM 17=CD 18=RVS 19=HM 20=DEL 29=CR 1
  45=CU 146=ROFF 147=CLR 148=INST 157=C
  L :rem 225
410 DATA AD,ADD,BEE,B,SEE,C,SEA,C,GEE,G,G
  RAY,GREY,EYE,I,INN,IN,JAY,J :rem 139
420 DATA MOOR,MORE,KNOT,NOT,ORE,OR,OAR,OR
  ,PEA,P,QUEUE,Q,TEA,T,TEE,T,TIE,TY
  :rem 46

```

```

430 DATA EWE,U,EWES,USE,WEE,WE :rem 97
440 DATA #,NUMBER,&,AND,',APOSTROPHE,*,TI
  MES,+,PLUS,-,MINUS :rem 123
450 DATA 0,ZERO,1,ONE,2,TWO,3,THREE,4,FOU
  R,5,FIVE,6,SIX,7,SEVEN,8,EIGHT:rem 83
460 DATA 9,NINE,=,EQUALS,?,QUESTION,@,AT
  :rem 223
470 DATA /,<,>,DIVIDED,LESS,MORE,BY,THAN,
  THAN :rem 18

```

Cassette Index

(Article on page 88.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

```

1 SYS65517 :rem 56
2 IFPEEK(781)=40THENMT$="{WHT}":GOTO4
  :rem 153
3 MT$="{BLU}" :rem 152
4 PRINTMT$:PRINT"{CLR}{10 DOWN}{4 RIGHT}
  {RVS}CASSETTE INDEX" :rem 40
5 FORQ=1TO2000:NEXT :rem 185
6 PRINT"{CLR}{2 DOWN}{3 RIGHT}{RVS}CASSE
  TE INDEX{OFF}":PRINT"{DOWN} TO USE THIS
  INDEX:" :rem 33
7 PRINT"{DOWN}{RIGHT}1 RESET CASSETTE"
  :rem 70
8 PRINT"{3 SPACES}COUNTER TO 000" :rem 92
9 PRINT"{DOWN}{RIGHT}2 FIND PROGRAM AND"
  :rem 118
10 PRINT"{3 SPACES}LOCATION" :rem 139
11 PRINT"{5 SPACES}(NEXT PAGE)" :rem 224
12 PRINT"{DOWN}{RIGHT}3 ADVANCE TAPE USIN
  G" :rem 55
13 PRINT"{3 SPACES}F.FWD, TO LOCATION"
  :rem 178
14 PRINT"{3 SPACES}DESIRED" :rem 54
15 PRINT"{DOWN}{RIGHT}4 STOP TAPE & FOLLO
  W" :rem 2
16 PRINT"{3 SPACES}{RVS}LOAD{OFF} INSTRU
  CTIONS:PRINT"{DOWN} {RVS}PRESS A KEY T
  O BEGIN{OFF}" :rem 48
17 GETAN$:IFAN$="GOTO17 :rem 153
18 PRINT"{CLR}{2 DOWN}{3 RIGHT}{RVS}CASSE
  TTE INDEX{OFF}":PRINT"{DOWN}THIS CASSE
  TTE HAS" :rem 74
19 PRINT"THE FOLLOWING PROGRAMS" :rem 56
20 PRINT"AT THE APPROXIMATE":PRINT"COUNT
  E R READING SHOWN:{DOWN}" :rem 242
21 READA$:READB$ :rem 160
22 PRINTA$TAB(14)B$ :rem 73
23 FORX=1TO8 :rem 237
24 READA$ :rem 231
25 IFA$="-1"GOTO33 :rem 217
26 READB$ :rem 234
27 IFB$="-1"GOTO33 :rem 220
28 PRINTTAB(1)A$TAB(16)B$ :rem 170
29 NEXTX :rem 2
30 PRINT:PRINT"PRESS KEY TO CONTINUE"
  :rem 121
31 GETP$:IFP$="GOTO31 :rem 19

```



```

32 IFA$<>"-1"GOTO18:IFB$<>"-1"GOTO18      :rem 4
33 PRINT:PRINT"[BLK]{2 SPACES}** END OF I   :rem 223
   NDEX **"MT$
34 PRINT"[HOME]{20 DOWN}SHOW AGAIN (Y/N)"   :rem 31
   ;:INPUTAN$
35 IFAN$="Y"THENGOTO38                       :rem 87
36 IFAN$<>"N"THENGOTO34                     :rem 134
37 END                                         :rem 65
38 RESTORE:GOTO18                             :rem 107
39 DATAPROGRAM NAME,COUNTER,DUMMY NAME01,   :rem 240
   000,DUMMY NAME02,000,DUMMY NAME03,000
40 DATADUMMY NAME04,000,DUMMY NAME05,000,   :rem 60
   DUMMY NAME06,000,DUMMY NAME07,000
41 DATADUMMY NAME08,000,PROGRAM NAME,COUN   :rem 245
   TER,DUMMY NAME09,000,DUMMY NAME10,000
42 DATADUMMY NAME11,000,DUMMY NAME12,000,   :rem 54
   DUMMY NAME13,000,DUMMY NAME14,000
43 DATADUMMY NAME15,000,DUMMY NAME16,000,   :rem 250
   PROGRAM NAME,COUNTER,DUMMY NAME17,000
44 DATADUMMY NAME18,000,DUMMY NAME19,000,   :rem 204
   DUMMY NAME20,000,DUMMY NAME21,000,-1

```

```

250 GOSUB410:PRINT UP$;TAB(30);NB:rem 205
260 GOSUB2490:CLOSE FP                       :rem 45
270 NEXTS1                                    :rem 92
280 PRINT"TO RESTORE FILES LOAD THIS";      :rem 56
290 PRINT" PROGRAM FROM THE BACKUP TAPE"    :rem 121
300 GOSUB 860                                :rem 177
310 FORSL=K1TO20:NEXT                       :rem 81
320 GOTO 2480                                :rem 156
330 PRINT"Q QUIT, SPACE CONTINUE":rem 248
340 GETI$:IFI$="GOTO340"                   :rem 107
350 IFI$<>"Q"GOTO370                         :rem 118
360 CLOSEFP:AN$="A":GOSUB410:GOTO2480     :rem 228
370 PRINT UP$ "{23 SPACES}" UP$           :rem 253
380 PRINT CHR$(18) " P TO PAUSE" CHR$(146  :rem 41
   ) UP$:GOTO80
390 PRINT#1,"024F";MID$(NA$+SP$,K1,16);MI  :rem 165
   D$(TY$,K1,K1);MID$(LN$+SP$,K1,K3);
400 NB=NB+24:RETURN                         :rem 156
410 PRINT#1,"005E";AN$:NB=NB+8:PRINT#1,C0  :rem 96
   $;C0$;C0$;:CLOSE1:RETURN
420 EN=LEN(DT$)                             :rem 82
430 IFASC(MID$(DT$,EN,1))<>160THENRETURN    :rem 149
440 DT$=LEFT$(DT$,EN-K1):GOTO420          :rem 94
450 GOSUB1110                                :rem 220
460 FOR S1=K1TONF                            :rem 245
470 BK=K0:NA$=NA$(S1):TY$=TY$(S1):rem 128
480 OPEN 1,1,0:NB=NB+300:GOSUB840 :rem 99
490 FM$="":PRINT:PRINT UP$ CHR$(18) " FOU  :rem 19
   ND" CHR$(146) " ";
500 IFRC$<>"F"THENCLOSE1:GOTO480 :rem 198
510 FORX=K1TO16:GET#1,I$:FM$=FM$+I$:NEXT   :rem 149
520 PRINT FM$:GET#1,A$,A$,A$,A$ :rem 141
530 IFFM$=NA$GOTO580                        :rem 164
540 GOSUB840:IFRC$="N"THENCLOSE1:GOSUB152  :rem 109
   0:GOTO480
550 NB=NB+LN:FORX=K1TOLN-K4:GET#K1,A$:NEX  :rem 240
   T:GOSUB840
560 IFRC$<>"D"GOTO550                       :rem 123
570 CLOSE1:GOTO480                          :rem 82
580 X=LEN(NA$):IFMID$(NA$,X,K1)=" "THENNA  :rem 147
   $=MID$(NA$,K1,X-K1):GOTO580
590 OPENFP,8,FP,"@0:"+NA$+CO$+TY$+"W"    :rem 83
600 GOSUB840:IFRC$="D"GOTO640 :rem 204
610 IFRC$="E"GOTO760                        :rem 123
620 IFRC$="N"THENGOSUB1510:GOTO470:rem 51
630 PRINT " EXPECTED D OR E":GOTO2480     :rem 39
640 BK=BK+K1:PRINT UP$;TAB(24);BK:rem 185
650 L=0                                       :rem 84
660 L=L+K1:IFL>LN-K4GOTO600 :rem 128
670 GET#1,A$:A$=MID$(A$+C0$,K1,K1):A=ASC(  :rem 73
   A$)
680 IFA<230THENPRINT#FP,A$;:GOTO660      :rem 143
690 IFA=230THENGET#1,A$:L=L+K1:A$=MID$(A$  :rem 232
   +C0$,K1,K1):PRINT#FP,A$;:GOTO660
700 IFA=231THEN730                          :rem 3
710 IFA=232 OR A=245 THEN750 :rem 193
720 PRINT#FP,A$;:GOTO660 :rem 186
730 GET#1,A$,A1$:L=L+K2:A1$=MID$(A1$+C0$,  :rem 220
   K1,K1)
740 FORX=K1TOASC(A$):PRINT#FP,A1$;NEXT:G  :rem 200
   OTO660

```

Disk/Tape Backup

(Article on page 164.)

```

10 SYS65517:IFPEEK(781)=40THENMT$="{WHT}"  :rem 56
   :GOTO30
20 MT$="{BLU}"                               :rem 199
30 GOSUB1580:IFBR$="R"THEN450 :rem 205
40 FORS1=K1TONF:GOSUB930 :rem 21
50 GET#FP,A$:A$=MID$(A$+C0$,K1,K1):ZT=ST   :rem 253
60 BK=BK+K1:PRINT UP$;TAB(17);BK:R$=""    :rem 184
70 GETI$:IFI$<>"GOTO330" :rem 119
80 LB$=A$:LB=ASC(LB$):NE=K1 :rem 33
90 IFZTTHENGOSUB150:GOSUB220:GOTO250     :rem 67
100 GET#FP,A$:A$=MID$(A$+C0$,K1,K1):ZT=ST  :rem 41
110 IFLEN(R$)>CMTHENGOSUB150:GOSUB220:GOT  :rem 1
   O60
120 IFLB$<>A$THEN140 :rem 119
130 IFNE<250THENNE=NE+K1:GOTO90 :rem 158
140 GOSUB150:GOTO80 :rem 134
150 IFNE>K1GOTO190 :rem 69
160 IFLB<CSTHENR$=R$+LB$:RETURN :rem 213
170 IFLB<233 OR LB=245THENR$=R$+CHR$(230)  :rem 241
   +LB$:RETURN
180 R$=R$+LB$:RETURN :rem 185
190 IFLB=SPTHENR$=R$+CS$+CHR$(NE):RETURN   :rem 254
200 IFLB=DATHENR$=R$+CHR$(245)+CHR$(NE):R  :rem 11
   ETURN
210 R$=R$+CHR$(231)+CHR$(NE)+LB$:RETURN    :rem 214
220 L$=MID$(STR$(LEN(R$)+K4),K2) :rem 247
230 PRINT#1,MID$(L$+SP$,K1,K3);"D";R$;    :rem 84
240 NB=NB+LEN(R$)+4:RETURN :rem 61

```



```

750 GET#1,A1$:L=L+K1:FORX=K1TOASC(A1$):PR
INT#FP,CHR$(A-200);:NEXT:GOTO660
:rem 156
760 GOSUB2490:CLOSE1:CLOSE FP :rem 19
770 IF A$<>"A"GOTO820 :rem 100
780 PRINT " FILE'" NA$ "' IS INCOMPLETE
:rem 63
790 PRINT"Q TO QUIT, SPACE TO CONTINUE
:rem 38
800 GETA$:IFA$="GOTO800 :rem 93
810 IFA$="Q"GOTO2480 :rem 102
820 NEXT S1:GOSUB860 :rem 181
830 FORSL=K1TO20:NEXT:GOTO2480 :rem 153
840 GET#1,L1$,L2$,L3$,RC$ :rem 31
850 LN=VAL(L1$+L2$+L3$):NB=NB+LN:RETURN
:rem 90
860 TT=VAL(MID$(TI$,K1,K2))*3600+VAL(MID$(
TI$,K3,K2))*60 :rem 93
870 TT=TT+INT(NB/25):HH=INT(TT/3600)
:rem 156
880 MM=INT((TT-HH*3600)/60) :rem 241
890 HH$=MID$(STR$(HH),2):IFLEN(HH$)<2THEN
HH$="0"+HH$ :rem 203
900 MM$=MID$(STR$(MM),2):IFLEN(MM$)<2THEN
MM$="0"+MM$ :rem 245
910 TI$=HH$+MM$+"00":PRINT "ESTIMATED TIM
E=";TI$ :rem 23
920 RETURN :rem 123
930 NA$=NA$(S1):TY$=TY$(S1) :rem 2
940 IFNB+LN(S1)*(BD+5)+BH<TB GOTOL050
:rem 61
950 OPEN 1,1,1,NA$:GOSUB390 :rem 240
960 PRINT#1,"004N";:CLOSE1 :rem 238
970 PRINT " LOAD ANOTHER CASSETTE"
:rem 254
980 PRINT "{3 SPACES}TYPE Q TO QUIT,"
:rem 23
990 PRINT "{2 SPACES}SPACE TO CONTINUE"
:rem 231
1000 GETA$:IF A$="" THEN1000 :rem 165
1010 IF A$="Q" GOTO2480 :rem 143
1020 PRINT " TAPE SIZE (MIN) ";TM;MID$(BS
$,1,LEN(STR$(TM))+2); :rem 173
1030 INPUT TM$:IFTM$=""THENTM$=STR$(TM)
:rem 104
1040 TB=VAL(TM$)*BM:GOSUB860:NB=K0:rem 36
1050 PRINT SP$;CR$ :rem 14
1060 PRINT"{4 SPACES}{UP}{RVS}P TO PAUSE
{OFF}":PRINTUP$ UP$ :rem 151
1070 PRINTNA$:BK=K0 :rem 135
1080 LN$=MID$(STR$(LN(S1)),K2) :rem 153
1090 OPEN FP,8,FP,"0:"+NA$+CO$+TY$+",R"
:rem 58
1100 OPEN 1,1,1,NA$:NB=NB+BH:GOSUB390:RET
URN :rem 122
1110 PRINT "{DOWN} FORMAT DISK (N OR Y)"
:rem 50
1120 INPUT " ";A$ :rem 56
1130 IFA$<>"Y"GOTO1200 :rem 204
1140 ND$="":PRINT "{DOWN} DISK NAME";
:rem 160
1150 INPUTND$:IFND$=""GOTO1200 :rem 9
1160 ID$="":PRINT " DISK ID{2 SPACES}";
:rem 248
1170 INPUTID$:IFID$=""GOTO1200 :rem 1
1180 PRINT#15,"N0:";ND$;";";ID$ :rem 144
1190 GOSUB 2490:IFELTHEN2490 :rem 87
1200 PRINT " OPEN DTB.ID.FILE" :rem 169
1210 OPEN 1,1,0,"DTB.ID.FILE" :rem 51
1220 NB=NB+300 :rem 224
1230 GOSUB840 :rem 226
1240 GET#1,A$ :rem 140
1250 IFA$<>VN$ THENPRINT " VERSION ERROR"
:GOTO2480 :rem 239
1260 PRINT "{CLR}{DOWN} FROM DISK:";
:rem 18
1270 FORX=1TO20:GET#1,A$:PRINT A$;:NEXT
:rem 91
1280 PRINT:PRINT "BACKED UP ON{2 SPACES}D
ATE:"; :rem 210
1290 FORX=1TO8 :GET#1,A$:PRINT A$;:NEXT
:rem 51
1300 PRINT " TIME:"; :rem 57
1310 FORX=1TO6 :GET#1,A$:PRINT A$;:NEXT
:rem 42
1320 PRINT :rem 83
1330 NF=0 :rem 200
1340 GOSUB840 :rem 228
1350 IFRC$="F" THEN1380 :rem 211
1360 IFRC$="E" THEN CLOSE1:RETURN:rem 200
1370 PRINT " REC CD ERROR":GOTO2480
:rem 200
1380 NA$="":FORX=1TO16:GET#1,A$:PRINTA$;
:rem 87
1390 NA$=NA$+A$:NEXT :rem 121
1400 GET#1,TY$:PRINT " TY$" "; :rem 81
1410 GET#1,A$,A2$,A3$:PRINT A$;A2$;A3$;
:rem 30
1420 PRINT:IFAF$="Y"THEN1480 :rem 158
1430 PRINT UP$:PRINT"BKUP Y OR N";
:rem 222
1440 YN$="":INPUT YN$ :rem 170
1450 IFMID$(YN$+"Y",K1,K1)="Y"GOTOL480
:rem 107
1460 IF YN$="N"GOTOL340 :rem 245
1470 GOTOL430 :rem 205
1480 NF=NF+K1 :rem 217
1490 NA$(NF)=NA$:TY$(NF)=TY$:GOTOL340
:rem 143
1500 RETURN :rem 166
1510 CLOSEFP:CLOSE1 :rem 180
1520 PRINT" LOAD CONTINUATION TAPE"
:rem 126
1530 PRINT" TYPE Q TO QUIT" :rem 19
1540 PRINT"{6 SPACES}SPACE TO CONTINUE"
:rem 15
1550 GETA$:IFA$=""GOTO1550 :rem 195
1560 IFA$="Q"GOTO2480 :rem 153
1570 GOSUB860:NB=0:RETURN :rem 60
1580 DIM LN(150),NA$(150),T$(4),TY$(150)
:rem 252
1590 BH=300:BD=256:BK=0:BM=840:BO=53280:C
M=250:CS=230:DA=45:DIR=8:FP=5:rem 24
1600 K0=0:K1=1:K2=2:K3=3:K4=4 :rem 75
1610 NB=0:NC=0:NE=0:NF=0:PS=8000:SP=32:TB
=0:TM=60 :rem 142
1620 AF$="":AN$="N":BR$="":FORX=1TO40:BS$
=BS$+CHR$(157):NEXT :rem 142
1630 C0$=CHR$(0):CB$="":CO$="":CS$=CHR$(
232) :rem 59
1640 DA$="":DN$="":FM$="":RC$="":SP$="
{9 SPACES}":SP$=SP$+SP$+SP$:UP$=CHR$(
145) :rem 227
1650 VN$="2" :rem 71
1660 OPEN15,8,15:POKE BO,0 :rem 177
1670 PRINTMT$:PRINTCHR$(147):PRINT"
{2 SPACES}DISK TO TAPE BACKUP
{2 DOWN}" :rem 176
1680 T$(K0)="DEL":T$(1)="SEQ":T$(2)="PRG"
:T$(3)="USR":T$(4)="REL" :rem 242
1690 PRINT"BACKUP OR RESTORE":INPUT"(B OR
R)";BR$ :rem 163

```



```

1700 BR$=MID$(BR$+" ",1,1) :rem 237
1710 IF BR$<>"B" AND BR$<>"R" GOTO2480 :rem 66
:rem 178
1720 PRINT"{DOWN}PROCESS ALL FILES":INPUT :rem 11
"(Y OR N");AF$ :rem 88
1730 AF$=MID$(AF$+"Y",1,1) :rem 47
1740 IF AF$<>"Y" AND AF$<>"N" GOTO2480 :rem 113
:rem 174
1750 IF BR$="R"THEN1890 :rem 115
1760 PRINT "{DOWN}TAPE SIZE (MIN) ";TM;MI :rem 115
D$(BS$,1,LEN(STR$(TM))+2); :rem 172
1770 INPUT TM$:IFTM$=""THENTM$=STR$(TM) :rem 27
:rem 115
1780 TM=VAL(TM$):TB=TM*BM :rem 157
1790 OPEN 3,8,3,"0:SYS DATE,S,R" :rem 224
1800 INPUT#15,E1,E2$,E3,E4 :rem 226
1810 IF E1 THEN D$="00/00/00":GOTO1830 :rem 104
:rem 164
1820 INPUT#3,D$ :rem 213
1830 CLOSE3 :rem 86
1840 PRINT "{DOWN} MM/DD/YY "; :rem 144
1850 INPUT DA$:IF DA$="" THEN DA$=D$ :rem 180
:rem 119
1860 IF D$=DA$ GOTO1890 :rem 180
1870 DA$=MID$(DA$+"{8 SPACES}",1,8):OPEN :rem 176
{SPACE}3,8,3,"0:SYS DATE,S,W": :rem 103
:rem 179
1880 GOSUB2490:PRINT#3,DA$:CLOSE3:rem 245
1890 T$=TI$ :rem 33
1900 PRINT "{DOWN} HHMM{5 SPACES}? "T$;MI :rem 246
D$(BS$,1,LEN(T$)+2); :rem 120
1910 INPUT T$:TI$=MID$(T$+"000000",1,6) :rem 59
:rem 32
1920 IF BR$="R"THENRETURN :rem 117
1930 PRINT"{CLR}{2 SPACES}READING DIRECTO :rem 117
RY{DOWN}":OPEN DIR,8,DIR,"$" :rem 117
1940 FOR L=K1 TO 142:GET#DIR,A$:NEXT :rem 117
:rem 26
1950 DN$="":FORL=K1TO16:GET#DIR,A$ :rem 117
:rem 227
1960 DN$=DN$+A$:NEXT:PRINT "{CLR} DISK:"D :rem 117
N$; :rem 118
1970 DT$=DN$:GOSUB420:DN$=DT$ :rem 185
1980 GET#DIR,A$,A$,I1$,I2$,A$,O1$,O2$ :rem 157
:rem 157
1990 PRINT" ID: ";I1$;I2$;:PRINT" OS: ";O1$ :rem 84
;O2${DOWN}" :rem 84
2000 FOR L=K1TO89:GET#DIR,A$:NEXT:rem 232
2010 NF=0 :rem 196
2020 RB=DIR:R$="" :rem 165
2030 FORR=K1TO254:GET#RB,A$:R$=R$+MID$(A$ :rem 239
+C0$,K1,K1):NEXT:ZS=ST :rem 192
2040 B=K0 :rem 129
2050 PRINT"{CLR} DISK:"DN$; :rem 129
2060 PRINTTAB(23)"ID: ";I1$;I2$;:PRINT" OS :rem 214
: ";O1$;O2${DOWN}" :rem 214
2070 FOR P=K1 TO 8 :rem 148
2080 T=ASC(MID$(R$,B+K1)):IFT=K0THENT=128 :rem 141
:rem 141
2090 L=ASC(MID$(R$,B+29)):H=ASC(MID$(R$,B :rem 237
+30)) :rem 237
2100 L=(L+256*H):IFL=K0THEN2200 :rem 227
2110 N$=MID$(R$,B+K4,16) :rem 227
2120 TY$=T$(T-128):IF TY$="DEL"THEN2200 :rem 155
:rem 155
2130 DT$=N$:GOSUB420:N$=DT$ :rem 38
2140 PRINT L;TAB(4);TY$;"{2 SPACES}";N$ :rem 111
:rem 111
2150 IFAF$="Y" THEN PRINT:GOTO2180 :rem 214
:rem 214
2160 PRINT" Y/N ? Y";MID$(BS$,1,3); :rem 135

```

Word Guess

(Article on page 66.)

BEFORE TYPING...

Before typing in programs, please refer to "How To Type COMPUTE!'s Gazette Programs," "A Beginner's Guide To Typing In Programs," and "The Automatic Proofreader" that appear before the Program Listings.

Program 1: Word Guess—64 Version

```

9 N=100:GT=30 :rem 202
10 GOSUB877 :rem 135

```



```

15 POKE53280,2:POKE53281,1:PRINT"{CLR}[7]
   " :rem 246
17 V=54296:W=54276:A=54277:H=54273:L=5427
   2:S=54278 :rem 251
20 DIM LE$(10),MI$(15),DI$(10),WU(N),WD$(
   N),AL$(27) :rem 103
25 FORI=1TON:READWD$(I):WU(I)=0:NEXT
   :rem 11
26 FORI=1TO27:READAL$(I):NEXT :rem 44
28 GOSUB503 :rem 130
30 RN=INT(N*RND(1))+1 :rem 182
35 IFWU(RN)=1THEN110 :rem 195
40 WU(RN)=1 :rem 111
50 LN=LEN(WD$(RN)) :rem 28
55 FORI=1TOLN:GN$=MID$(WD$(RN),I,1):LE$(I
   )=GN$:NEXT :rem 62
80 PRINT"{CLR}{2 DOWN}";TAB(13);"GUESS TH
   IS WORD" :rem 47
85 V1=1205-LN:V2=1285-LN :rem 86
90 FORI=1TOLN:POKEV1,32:POKEV2,67:POKEV1+
   L,0:POKEV2+L,0:V1=V1+2:V2=V2+2:NEXT
   :rem 21
102 PRINT"{HOME}{7 DOWN}ENTER YOUR GUESS
   {SPACE}" :rem 66
104 PRINT"{HOME}{10 DOWN}LETTERS GUESSED
   {SPACE}SO FAR:" :rem 11
106 IT=TI/60 :rem 163
107 TL=TI-TV=TL-60:TU=GT*60 :rem 177
108 GETGS$:IFGS$<>"THEN112 :rem 63
109 GOSUB310:IFTU=0THENG$=CHR$(45):GOTO1
   15 :rem 124
110 IFGS$=""THEN108 :rem 40
112 IFLEN(G$)>1THEN108 :rem 72
113 IFASC(G$)<65ORASC(G$)>90THEN108
   :rem 167
115 GU=GU+1 :rem 104
120 MI$(GU)=GS$ :rem 53
125 FORI=1TOLN :rem 115
130 IFLE$(I)=DI$(I)THEN145 :rem 195
140 IFGS$=LE$(I)THENDI$(I)=GS$:GOSUB610
   :rem 52
145 NEXTI :rem 34
160 FORJ=1TO27 :rem 66
170 IFMI$(GU)=AL$(J)THEN177 :rem 37
173 NEXTJ :rem 36
177 V3=1525-LN-5+GU*2-2 :rem 221
178 IFJ=27THENJ=45 :rem 62
180 POKEV3,J:POKEV3+L,0 :rem 140
185 GL=0:GL=LN+5-GU :rem 107
190 PRINT"{HOME}{15 DOWN}GUESSES LEFT:
   {8 SPACES}{6 LEFT}";GL :rem 125
195 AG=1 :rem 149
200 FORI=1TOLN:IFDI$(I)<>LE$(I)THENAG=0
   :rem 110
202 NEXTI :rem 28
204 IFAG=0ANDGL>0THEN107 :rem 181
206 ET=TI/60:FT=INT(ET-IT):TM=INT(FT/60):
   TS=FT-(TM*60) :rem 58
208 BA$=STR$(TS):SA$=MID$(BA$,2,2)
   :rem 116
210 IFTS<10THENSA$=""MID$(BA$,2,1)
   :rem 218
214 PRINT"{HOME}{15 DOWN}";TAB(20);"GUESS
   TIME";TM;CHR$(58);SA$ :rem 61
215 IFGL=0ANDAG=0THENGOSUB705 :rem 58
220 IFAG=1THENGOSUB810 :rem 97
225 PRINT"{HOME}{21 DOWN}{BLK}F3 TO QUIT"
   :rem 209
230 PRINT"F5 TO GO TO A DIFFERENT WORD[7]
   " :rem 107
235 GETAC$:IFAC$=""THEN235 :rem 221
240 IFAC$="{F5}"THEN28 :rem 110
245 IFAC$="{F3}"THEN PRINT"{CLR}":END
   :rem 125
250 GOTO235 :rem 106
310 TV=TV+60 :rem 182
320 TM=TI-TV :rem 231
330 IFTM<60THEN320 :rem 44
340 TU=(GT*60-TV+TL)/60 :rem 48
350 B$=STR$(TU) :rem 82
360 S$=MID$(B$,2,2) :rem 190
370 IFTU<10THENS$=""0"+MID$(B$,2,1):rem 97
380 PRINT"{HOME}{7 DOWN}";TAB(24);"TIME :
   ";S$ :rem 89
390 RETURN :rem 124
503 SP$="" :rem 224
505 FORI=1TO10:LE$(I)=SP$:MI$(I)=SP$:DI$(
   I)=SP$:PK(I)=32:PM(I)=32:NEXT:rem 129
510 FORI=1TO15:MI$(I)=SP$:NEXT :rem 121
530 GU=0 :rem 161
540 RETURN :rem 121
610 FORJ=1TO26 :rem 65
620 IFDI$(I)=AL$(J)THEN625 :rem 199
623 NEXTJ :rem 36
625 V1=1205-LN+I*2-2 :rem 31
630 POKEV1,J:POKEV1+L,0 :rem 160
635 POKEV,15:POKEW,33:POKEA,32:POKES,240
   :rem 192
640 FORT=1TO10:POKEH,68:POKEL,149:NEXT
   :rem 138
645 POKEH,0:POKEL,0:POKEW,0 :rem 159
650 FORT=1TO150:NEXT :rem 246
655 RETURN :rem 128
705 PRINT"{HOME}{18 DOWN}{8 SPACES}SORRY,
   YOU MISSED THE WORD" :rem 92
710 PRINT"{8 SPACES}IT WAS ";WD$(RN)
   :rem 220
715 POKEV,15:POKEW,33:POKEA,32:POKES,240
   :rem 191
720 FORT=1TO200:POKEH,6:POKEL,16:NEXT
   :rem 75
725 POKEH,0:POKEL,0:POKEW,0 :rem 158
730 RETURN :rem 122
810 PRINT"{HOME}{18 DOWN}{8 SPACES}*** CO
   NGRATULATIONS ***" :rem 40
815 POKEV,15:POKEW,33:POKEA,32:POKES,240
   :rem 192
820 FORT=1TO25:POKEH,68:POKEL,149:NEXT
   :rem 144
825 POKEH,0:POKEL,0 :rem 131
830 FORT=1TO100:POKEH,68:POKEL,149:NEXT
   :rem 187
835 POKEH,0:POKEL,0:POKEW,0 :rem 160
850 RETURN :rem 125
877 POKE53281,15:POKE53280,10 :rem 98
880 PRINT"{CLR}{8 DOWN}{10 SPACES}{BLK}W
   {SPACE}O R D - G U E S S" :rem 12
890 PRINT:PRINT:PRINT"{10 SPACES}INSTRUCT
   IONS (Y/N)" :rem 220
895 GETAB$:IFAB$=""THEN895 :rem 243
897 IFAB$<>"Y"THEN975 :rem 201
905 POKE53281,13:POKE53280,3 :rem 42
910 PRINTCHR$(144);" {CLR}{15 SPACES}WORD-
   GUESS":PRINT :rem 219
915 PRINT"{3 SPACES}THE OBJECT OF WORD-GU
   ESS IS TO DE-" :rem 130
920 PRINT"TERMINATE THE LETTERS THAT MAKE U
   P A WORD." :rem 35
922 PRINT"{3 SPACES}THE WORD CAN BE UP TO
   10 CHARACTERS" :rem 109
924 PRINT"LONG.{2 SPACES}YOU HAVE 5 MORE

```



```

[SPACE]GUESSES THAN THE" :rem 130
926 PRINT"LENGTH OF THE WORD TO DETERMINE
ALL THE" :rem 224
928 PRINT"LETTERS." :rem 197
932 PRINT"{3 SPACES}YOU HAVE";GT;"SECONDS
TO MAKE A GUESS." :rem 171
934 PRINT"IF THE LETTER IS IN THE WORD, I
T WILL" :rem 2
936 PRINT"SHOW IN ITS PROPER SLOT. ALL LE
TTERS" :rem 127
938 PRINT"USED WILL BE DISPLAYED FOR REFE
RENCE." :rem 168
940 PRINT"{3 SPACES}MULTIPLE OCCURENCES O
F THE SAME" :rem 96
942 PRINT"LETTER WILL BE SHOWN IN ALL APP
ROPRIATE" :rem 69
944 PRINT"SLOTS.":PRINT :rem 252
946 PRINT"{3 SPACES}AFTER GUESSING A WORD
,PRESS:" :rem 187
948 PRINT"{5 SPACES}{RVS}F3{OFF} TO QUIT"
:PRINTTAB(8)"OR" :rem 133
950 PRINT"{5 SPACES}{RVS}F5{OFF} TO GUESS
ANOTHER WORD" :rem 5
952 PRINT:PRINTTAB(15);"GOOD LUCK!"
:rem 122
954 PRINTTAB(8);"PRESS ANY KEY TO START"
:rem 157
956 GETAD$:IFAD$=""THEN956 :rem 243
975 RETURN :rem 133
1000 DATA DEGREE,DIVISION,SCROD,NAIVE,THI
NKER :rem 159
1005 DATA WATER,LIGHT,REGIME,REVAMP,HYMN
:rem 75
1010 DATA REGENCY,SYMPATHY,COUPON,PLANT,S
POTLIGHT :rem 41
1015 DATA EXPRESS,AARDVARK,RUBBER,EMINENC
E,BOOMERANG :rem 167
1020 DATA POETIC,EARTHQUAKE,MAIL,PARALYZE
,HEAT :rem 233
1025 DATA LAPSE,NITROGEN,GLASS,IDIOT,MEMO
RY :rem 57
1030 DATA FLOWER,COMPUTER,LANDMARK,MESSAG
E,CLARITY :rem 51
1035 DATA AMAZING,HARMONY,GALLON,JELLYFIS
H,FLAME :rem 132
1040 DATA ENVIOUS,DOORBELL,DESTINY,DAISY,
CORSAGE :rem 169
1045 DATA CANARY,BOYCOTT,OFFER,BENEFICIAL
,ARMADILLO :rem 63
1050 DATA ANGELIC,MONTH,BALMY,MARGARINE,L
ODGE :rem 127
1055 DATA ORIGINAL,OXYGEN,SKIING,PLASMA,P
REMATURE :rem 252
1060 DATA SPECIAL,REGARD,REFUGEE,SHAKE,WA
TERCRESS :rem 185
1065 DATA SALOON,WASHABLE,WHATEVER,YOLK,W
INDOW :rem 38
1070 DATA ACTION,ZENITH,YELLOW,TRICYCLE,Y
AM :rem 68
1075 DATA FETCH,PRICE,CHEMICAL,DOWNWIND,H
IBERNATE :rem 166
1080 DATA COUNTERACT,CLOVERLEAF,EARTHQUAK
E,FLEXIBLE,QUEEN :rem 34
1085 DATA PRECEDENT,ORANGE,CONSTRUCT,UNIC
ORN,IMPORTANT :rem 143
1090 DATA MEDALIST,YOURSELF,NOVICE,GEOGRA
PHY,EXPENSIVE :rem 129
1100 DATA MONITOR,HEADACHE,TELEVISION,TAX
,LANGUAGE :rem 10
2000 DATA A,B,C,D,E,F,G,H,I,J,K,L,M
:rem 135

```

```

2010 DATA N,O,P,Q,R,S,T,U,V,W,X,Y,Z,-
:rem 138

```

Program 2: Word Guess—VIC Version

Note: 8K or more expansion required.

```

9 N=100:GT=30 :rem 202
10 GOSUB880 :rem 129
15 POKE36879,26:PRINT"{CLR}" :rem 216
17 V=36878:H=36876:L=33792 :rem 163
20 DIMLE$(10),MI$(15),DI$(10),WU(N),WD$(N
),AL$(27) :rem 103
25 FORI=1TON:READ WD$(I):WU(I)=0:NEXT
:rem 11
26 FORI=1TO27:READ AL$(I):NEXT :rem 44
28 GOSUB503 :rem 130
30 RN=INT(N*RND(1))+1 :rem 182
35 IF WU(RN)=1 THEN 110 :rem 195
40 WU(RN)=1 :rem 111
50 LN=LEN(WD$(RN)):REM FIND LENGTH OF WOR
D :rem 238
55 FOR I=1TOLN:GN$=MID$(WD$(RN),I,1):LE$(
I)=GN$:NEXT :rem 62
80 PRINT "{CLR}{2 DOWN}{BLU}{4 SPACES}GUE
SS THIS WORD" :rem 8
85 V1=4196-LN:V2=4240-LN :rem 92
90 FOR I=1TOLN:POKEV1,32:POKEV2,67:POKEV1
+L,0:POKEV2+L,0:V1=V1+2:V2=V2+2:NEXT
:rem 21
102 PRINT "{HOME}{8 DOWN}ENTER YOUR GUESS
" :rem 83
104 PRINT "{HOME}{11 DOWN}LETTERS GUESSED
SO FAR:" :rem 28
106 IT=TI/60 :rem 163
107 TL=TI:TV=TL-60:TU=GT*60 :rem 177
108 GET GS$:IF GS$<>""THEN 112 :rem 63
109 GOSUB310:IFTU=0THENGSS$=CHR$(45):GOTO1
15 :rem 124
110 IF GS$=""THEN 108 :rem 40
112 IF LEN(GS$)>1 THEN 108 :rem 72
113 IF ASC(GS$)<65 OR ASC(GS$)>90 THEN 10
8 :rem 167
115 GU=GU+1 :rem 104
120 MI$(GU)=GS$ :rem 53
125 FOR I=1TOLN :rem 115
130 IF LE$(I)=DI$(I) THEN 145 :rem 195
140 IFGS$=LE$(I)THENDI$(I)=GS$:GOSUB610
:rem 52
145 NEXT I :rem 34
160 FOR J = 1 TO 27 :rem 66
170 IF MI$(GU)=AL$(J) THEN 177 :rem 37
173 NEXT J :rem 36
177 V3=4375-LN-5+GU*2-2 :rem 227
178 IF J=27 THEN J=45:REM POKE POSITION F
OR DASH :rem 7
180 POKEV3,J:POKEV3+L,0 :rem 140
185 GL=0:GL=LN+5-GU :rem 107
190 PRINT "{HOME}{15 DOWN}GUESSES LEFT:
{8 SPACES}{6 LEFT}":GL :rem 125
195 AG=1 :rem 149
200 FOR I=1TOLN:IFDI$(I)<>LE$(I)THENAG=0
:rem 110
202 NEXT I :rem 28
204 IF AG=0 AND GL>0 THEN 107 :rem 181
206 ET=TI/60:FT=INT(ET-IT):TM=INT(FT/60):
TS=FT-(TM*60) :rem 58
208 BA$=STR$(TS):SA$=MID$(BA$,2,2)
:rem 116
210 IF TS<10THENSA$=""+MID$(BA$,2,1)
:rem 218
214 PRINT"{HOME}{19 DOWN}{3 SPACES}GUESS

```



```

    {SPACE}TIME";TM":"SA$           :rem 134
215 IFGL=0ANDAG=0THENGOSUB705       :rem 58
220 IFAG=1THENGOSUB810               :rem 97
225 PRINT "{HOME}{21 DOWN}{BLK}{6 SPACES}
    {RVS}F3{OFF} TO QUIT"           :rem 117
230 PRINT "{4 SPACES}{RVS}F5{OFF} ANOTHER
    WORD";:POKE198,0                :rem 116
235 GET AC$:IF AC$="" THEN 235       :rem 221
240 IF AC$="{F5}" THEN 28            :rem 110
245 IF AC$="{F3}" THEN PRINT "{CLR}" :rem 108
                                           :rem 110
250 END                               :rem 182
310 TV=TV+60                          :rem 231
320 TM=TI-TV                           :rem 44
330 IF TM<60 THEN320                  :rem 48
340 TU=(GT*60-TV+TL)/60              :rem 82
350 B$=STR$(TU)                       :rem 190
360 S$=MID$(B$,2,2)                   :rem 97
370 IF TU<10 THEN S$="0"+MID$(B$,2,1)
                                           :rem 245
380 PRINT "{HOME}{19 DOWN}";TAB(6);"TIME
    {SPACE}":;S$                     :rem 124
390 RETURN                             :rem 224
503 SP$=""                             :rem 224
505 FOR I = 1TO10:LE$(I)=SP$:MI$(I)=SP$:D
    I$(I)=SP$:PK(I)=32:PM(I)=32:NEXT
                                           :rem 129
510 FOR I=11TO15:MI$(I)=SP$:NEXT      :rem 121
530 GU=0                               :rem 161
540 RETURN                             :rem 121
610 FOR J=1 TO 26                      :rem 65
620 IF DI$(I)=AL$(J) THEN 625         :rem 199
623 NEXT J                             :rem 36
625 V1=4196-LN+I*2-2                  :rem 43
630 POKE V1,J:POKEVI+L,0              :rem 160
635 POKEV,15                           :rem 181
640 FORT=1TO10:POKEH,218:NEXT          :rem 56
645 POKEH,0                             :rem 114
650 FORT=1TO150:NEXT                   :rem 246
655 RETURN                             :rem 128
705 PRINT "{HOME}{15 DOWN} SORRY, THE WOR
    D WAS"                            :rem 82
710 PRINT "{DOWN}{7 SPACES}{RVS}";WD$(RN)"
    {OFF}"                             :rem 77
715 POKE V,15                          :rem 180
720 FORT=1TO200:POKEH,140:NEXT         :rem 98
725 POKE H,0                            :rem 113
730 RETURN                             :rem 122
810 PRINT "{HOME}{15 DOWN} **CONGRATULATI
    ONS**"                             :rem 161
815 POKEV,15                           :rem 181
820 FORVV=1TO2:FORT=1TO25:POKEH,210:NEXT
                                           :rem 70
825 POKEH,0:NEXT                       :rem 235
830 FORT=1TO100:POKEH,230:NEXT         :rem 99
835 POKEH,0                             :rem 115
850 RETURN                             :rem 125
880 PRINT "{CLR}{8 DOWN}{2 SPACES}W O R D
    {SPACE}- G U E S S"               :rem 124
890 PRINT:PRINT:PRINT "{2 SPACES}{DOWN}INS
    TRUCTIONS? (Y-N)"                 :rem 42
895 GETAB$:IFAB$="" THEN895            :rem 243
897 IFAB$<>"Y" THEN990                 :rem 198
910 PRINTCHR$(144);"{CLR}":PRINT      :rem 235
915 PRINT "{3 SPACES}THE OBJECT OF WORD GU
    ESS IS TO DETERMINE THE LETTERS THAT
    {SPACE}MAKE"                       :rem 143
920 PRINT"UP A WORD. THE WORD{3 SPACES}CA
    N BE UP TO 10{7 SPACES}LETTERS LONG.
    {SPACE}YOU HAVE";                  :rem 184
922 PRINT"5 MORE GUESSES THAN{3 SPACES}TH
    E LENGTH OF THE WORDTO DETERMINE ALL
    {SPACE}THE"                        :rem 111
924 PRINT"LETTERS. YOU HAVE";GT       :rem 184
926 PRINT"SECONDS TO MAKE A{5 SPACES}GUES
    S. IF THE LETTER"                 :rem 120
927 PRINT"IS IN THE WORD, IT{4 SPACES}WIL
    L SHOW IN ITS"                    :rem 140
928 PRINT"PROPER SLOT. ALL{6 SPACES}LETTE
    RS USED WILL BE{2 SPACES}DISPLAYED FO
    R"                                  :rem 46
929 PRINT"{DOWN}{4 SPACES}{RVS}PRESS ANY
    {SPACE}KEY":POKE198,0:WAIT198,1
                                           :rem 203
930 PRINT "{CLR}{DOWN}REFERENCE. MULTIPLE
    {3 SPACES}OCCURENCES OF THE SAMELETTE
    R WILL BE SHOWN"                  :rem 222
932 PRINT"IN ALL APPROPRIATE{4 SPACES}SLO
    TS.{19 SPACES}AFTER GUESSING A":rem 1
933 PRINT"WORD, PRESS:{DOWN}{12 SPACES}
    {RVS}F3{OFF} TO QUIT,OR{DOWN}
    {9 SPACES}{RVS}F5{OFF} TO GUESS ANOTH
    ER"                                 :rem 235
952 PRINT:PRINTTAB(6);"GOOD LUCK!":rem 74
954 PRINT "{3 DOWN}{RVS}PRESS ANY KEY TO S
    TART":POKE198,0                   :rem 174
956 GETAD$:IFAD$="" THEN956           :rem 243
990 RETURN                             :rem 130
1000 DATA DEGREE, DIVISION, SCROD, NAIVE, THI
    NKER                                :rem 159
1005 DATA WATER, LIGHT, REGIME, REVAMP, HYMN
                                           :rem 75
1010 DATA REGENCY, SYMPATHY, COUPON, PLANT, S
    POTLIGHT                            :rem 41
1015 DATA EXPRESS, AARDVARK, RUBBER, EMINENC
    E, BOOMERANG                       :rem 167
1020 DATA POETIC, EARTHQUAKE, MAIL, PARALYZE
    , HEAT                              :rem 233
1025 DATA LAPSE, NITROGEN, GLASS, IDIOT, MEMO
    RY                                   :rem 57
1030 DATA FLOWER, COMPUTER, LANDMARK, MESSAG
    E, CLARITY                          :rem 51
1035 DATA AMAZING, HARMONY, GALLON, JELLYFIS
    H, FLAME                             :rem 132
1040 DATA ENVIOUS, DOORBELL, DESTINY, DAISY,
    CORSAGE                              :rem 169
1045 DATA CANARY, BOYCOTT, OFFER, BENEFCIAL
    , ARMADILLO                         :rem 63
1050 DATA ANGELIC, MONTH, MERRY, MARGARINE, L
    ODGE                                 :rem 153
1055 DATA ORIGINAL, OXYGEN, SKIING, PLASMA, P
    REMATURE                             :rem 252
1060 DATA SPECIAL, REGARD, REFUGEE, SHAKE, WA
    TERCRESS                             :rem 185
1065 DATA SALOON, WASHABLE, WHATEVER, YOLK, W
    OOLLY                                :rem 52
1070 DATA ACTION, ZENITH, YELLOW, TRICYCLE, Y
    AM                                   :rem 68
1075 DATA FETCH, PRICE, CHEMICAL, DOWNWIND, H
    IBERNATE                             :rem 166
1080 DATA COUNTERACT, CLOVERLEAF, FROG, FLEX
    IBLE, QUEEN                         :rem 101
1085 DATA PRECEDENT, ORANGE, CONSTRUCT, UNIC
    ORN, IMPORTANT                       :rem 143
1090 DATA MEDALIST, YOURSELF, NOVICE, GEOGRA
    PHY, EXPENSIVE                      :rem 129
1100 DATA MONITOR, HEADACHE, TELEVISION, TAX
    , LANGUAGE                           :rem 10
2000 DATA A,B,C,D,E,F,G,H,I,J,K,L,M
                                           :rem 135
2010 DATA N,O,P,Q,R,S,T,U,V,W,X,Y,Z,-
                                           :rem 138

```


COMPUTE!'s Gazette for Commodore

AUTHOR GUIDE

COMPUTE!'s Gazette for Commodore is looking for interesting, useful articles aimed at beginning to intermediate VIC-20 and Commodore 64 users. If you have an article idea or a good original program, we'd like to see it. Don't worry if you are not a professional writer. We are more concerned with the content of an article than its style. Simply try to be clear in your writing and check your program for any bugs.

COMPUTE!'s Gazette for Commodore is a consumer-oriented magazine for VIC-20 and Commodore 64 users who want to get the most out of their computers in a non-technical way. It is aimed primarily at home users, not all of whom necessarily want to become expert programmers. If your article covers a more advanced or technical topic, you may choose to submit it to our companion publication, **COMPUTE!** If you submit an article to one of our magazines and we believe it would be more suitable to the other, we will transfer your submission to the right editors. The basic editorial requirements for publication are the same for both magazines; so are the payment rates.

The following guidelines will permit your good ideas and programs to be more easily edited and published. Most of these suggestions serve to improve the speed and accuracy of publication:

1. The upper left corner of the first page should contain your name, address, telephone number, and the date of submission.

2. The following information should appear in the upper right corner of the first page. If your article is specifically directed to either the VIC-20 or Commodore 64, please state which one. In addition, please indicate the memory requirements of programs.

3. The underlined title of the article should start about 2/3 of the way down the first page.

4. Following pages should be typed normally, except that in the upper right corner there should be an abbreviation of the title, your last name, and the page number. For example: Memory Map/Smith/2.

5. Short programs (under 20 lines) can easily be included within the text. Longer programs should be separate listings. *It is essential that we have a copy of the program, recorded twice, on a tape or disk.* The tape or disk should be labeled with your name and the title of the article. Tapes are fairly sturdy, but disks need to be enclosed within plastic or cardboard mailers (available at photography, stationery, or computer supply stores).

It is far easier for others to type in your program if you use CHR\$(X) values and TAB(X) or SPC(X) instead of cursor manipulations to format your output. For five carriage returns, FOR I=1 TO 5:PRINT:NEXT I is far more "portable" to other computers with other BASICs and also easier to type in. And, instead of a dozen right-cursor symbols, why not simply use PRINT SPC(12)? A quick check through your program –

making these substitutions – would be greatly appreciated by your editors and by your readers.

6. If your article is accepted and you have since made improvements to the program, please submit an entirely new tape or disk and a new copy of the article reflecting the update. We cannot easily make revisions to programs and articles. It is necessary that you send the revised version as if it were a new submission entirely, but be sure to indicate that your submission is a revised version by writing "Revision" on the envelope and the article.

7. All lines within the text of the article should be spaced so that there is about 1/2 inch between them. A one-inch margin should be left at the right, left, top, and bottom of each page. No hyphens should be used at the ends of lines to break words. And please do not justify. Leave the lines ragged.

8. Standard typing paper should be used (no onionskin or other thin paper) and typing should be on one side of the paper only (upper- and lowercase).

9. Sheets should be attached together with a paper clip. Staples should not be used.

10. A good general rule is to spell out the numbers zero through ten in your article and write higher numbers as numerals (1024). The exceptions to this are: Figure 5, Table 3, TAB(4), etc. Within ordinary text, however, the zero through ten should appear as words, not numbers. Also, symbols and abbreviations should not be used within text: use "and" (not &), "reference" (not ref.), "through" (not thru).

11. For greater clarity, use all capitals when referring to keys (RETURN, TAB, ESC, SHIFT), BASIC words (LIST, RND, GOTO), and three languages (BASIC, APL, PILOT). Headlines and subheads should, however, be initial caps only, and emphasized words are not capitalized. If you wish to emphasize, underline the word and it will be italicized during typesetting.

12. COMPUTE!'s Gazette for Commodore pays between \$75 and \$1000 for published articles. In general, the rate reflects the length and quality of the article. Payment is made upon acceptance of an article. Following submission (Editorial Department, COMPUTE!'s Gazette for Commodore, P.O. Box 5406, Greensboro, NC 27403) it will take from four to six weeks for us to reply. If your work is accepted, you will be notified by a letter which will include a contract for you to sign and return. Rejected manuscripts are returned to authors who enclose an SASE. We do not consider articles which are multiple submissions. If you wish to send an article to another magazine for consideration, please do not submit it to us.

13. Articles can be of any length – from a single-line routine to a multi-issue series. The average article is about four to eight double-spaced, typed pages.

14. If you want to include photographs, they should be 5x7, black-and-white glossies.

COMPUTE!'s GAZETTE Back Issues

JULY 1983: Commodore 64 Video Update; Snake Escape; Alfabug; VIC Marquee; Word Hunt; Learning To Program In BASIC; Quickfind; 64 Paddle Reader; Machine Language For Beginners; Enlivening Programs With Sound; Using Joysticks On The 64.

OCTOBER 1983: The Anatomy of Computers; Telegaming Today And Tomorrow; Commodore's Public Domain Programs; Oil Tycoon; Re-BEEP; Aardvark Attack; Word Match; Machine Language For Beginners; How To Use Tape And Disk Files; Understanding 64 Sound; Speeding Up The VIC; HOTWARE; Improving 64 Video Quality; Using The VIC's Clock.

MARCH 1984: The Electronic Castle; Managing Your Home With Your Computer; Getting Started With A Disk Drive, Part 5; CUT-OFF!; Poker; Tree Tutor For Tots; Guess America!; Sea Route To India.

APRIL 1984: Robots: The New Mobile Computers; How To Start A User Group; Bingo 64; Making Calendars; French Tutor; Hints & Tips: Adding A Second Joystick To The VIC; Power BASIC: Numeric Keypad.

MAY 1984: Exploring 64 Sound; SpeedScript Revisited; Sound Sculptor For The 64; Props; Mind Boggle; Memo Writer; The Beginner's Corner: Teaching Music With Computers.

JUNE 1984: The Future Of Computer Games: Software That Thinks For Itself; 3-D Tic-Tac-Toe; Castle Dungeon; Therapy; File Copier; Power BASIC: One-Touch Keywords; The Beginner's Corner: Planning A Game Program.

JULY 1984: In Touch With Your Computer: Graphics Tablets And Light Pens; Space Patrol; Robot Math; Ultrafont +; Machine Language For Beginners: What Is Machine Language?; The Beginner's Corner: Quilt Squares.

AUGUST 1984: A Survey Of Printers For The VIC And 64; Selecting A Printer Interface; Campaign Manager; Sprite Magic; Balloon Blitz; Disk Purge; The Beginner's Corner: Using A Printer.

Issues not listed are not available.

Back issues of COMPUTE!'s GAZETTE are \$4 each. All prices include freight in the U.S. Outside the U.S. add \$1 per magazine order for surface postage, \$4 per magazine for air mail postage. ALL BACK ISSUES ARE SUBJECT TO AVAILABILITY.

In the continental U.S. call
TOLL FREE 800-334-0868
(in North Carolina call 919-275-9809)

Or write to:
COMPUTE!'s GAZETTE Back Issues
P.O. Box 5406
Greensboro, NC 27403

Prepayment required in U.S. Funds. MasterCard, VISA, and American Express accepted.
North Carolina residents please add 4½% sales tax.



A New Age Dawns for Microcomputer Programming

Meet PROMAL™
The First Fast Structured Language That Lets You Program The Way You Always Wanted To. And For Only \$49.95.

PROMAL™ is innovative. PROMAL (PROgrammer's Micro Application Language) was designed to achieve maximum performance from small computers...performance previously impossible except with machine language. And it was developed, specifically, to meet the need for a development system for limited memory environments.

PROMAL is complete. It's a fast, structured programming language. It's also a true development system, complete with its own command-oriented operating system executive; fast one-pass compiler; and full-screen cursor-driven editor. In short, PROMAL is the complete set of tools that microcomputer programmers have been waiting for.

PROMAL is fast.

Commodore 64 Benchmark (Sieve of Eratosthenes)	PROMAL	BASIC	COMAL	FORTH	PASCAL
Execution Time (secs.)	30	630	490	51	55
Object Code Size (bytes)	128	255	329	181	415
Program Load Time (secs.)	3.2	3.8	6.3	11.2	23.5
Compile Time (secs.)	8.5	—	—	3.9	108

As the benchmark results in the table show, PROMAL is much faster than any language tested. From 70% to 2000% faster! And it generates the most compact object code. The PROMAL compiler is so fast that it can compile a 100-line source program in 10 seconds or less. And, not only is it fast in compile and run time, it also reduces programming development time.

PROMAL is easy.

It's easier to learn than Pascal or C or FORTH. It makes use of powerful structured statements, like IF-ELSE, WHILE, REPEAT, FOR, and CHOOSE. Indentation of statements is part of the language's syntax, so all programs are neatly and logically written. There are no line numbers to complicate your programming. And comments don't take up memory space, so you can document programs completely. And with the full-screen editor, you can speed through program development

with saves to memory and compilation from memory workspace.

PROMAL is elegant.

PROMAL overcomes the performance limitations inherent in all small systems. It gives you access to the power of the machine. But it doesn't require the complexity of machine language programming. With PROMAL, you can have performance the easy way...since it was developed from the very beginning to work on small systems...elegantly.

PROMAL may be the answer to your programming needs.

Finally, there's an answer to the need for a complete environment for simple and rapid program development. Finally, a new age has begun for microcomputer programmers. Finally, there's PROMAL.

PROMAL FEATURES

COMPILED LANGUAGE

Structured procedural language with indentation
 Fast, 1-pass compiler
 Simplified syntax requirements
 No line numbering required
 Long variable names
 Global, Local, & Arg variables
 Byte, Word, Integer & Real types
 Dec or Hex number types
 Functions w/ passed arguments
 Procedures w/ passed arguments
 Built in I/O library
 Arrays, strings, pointers
 Control Statements: IF-ELSE, IF, WHILE, FOR, CHOOSE, BREAK, REPEAT, INCLUDE, NEXT, ESCAPE, REFUGE
 Compiler I/O from/to disk or memory

EXECUTIVE

Command oriented, w/ line editing
 Memory resident
 Allows multiple user programs in memory at once
 Function key definitions
 Program abort and pause
 Resident system commands, 8 user-defined resident commands, no limit on disk commands
 Prior command recall
 I/O Re-direction to disk or printer
 Batch jobs

EDITOR

Full-screen, cursor driven
 Function key controlled
 Line insert, delete, search
 String search and replace
 Block copy, move, delete & write to/read from file
 Auto indent, undent support

LIBRARY

43 Machine-language commands
 Memory resident
 Call by name with arguments
 I/O, Edit, String, Cursor control and much more

PROMAL runs on Commodore 64s with disk drive.

PROMAL is available for the Commodore 64 now.

PROMAL is scheduled for release on the Apple IIe in December, 1984 and on the IBM PC in 1st Quarter, 1985.

HOW TO ORDER

- Please send me my copy of PROMAL for the Commodore 64 at \$49.95 plus \$5.00 for shipping and handling at a total cost of \$54.95. Satisfaction guaranteed.
- Please send me a PROMAL demo diskette for the Commodore 64 at \$10 for the diskette plus \$2.50 for postage and handling for a total cost of \$12.50. (Non-refundable.)
- My check is enclosed. Please charge my purchase to my... Visa MasterCard

Card Number _____ Expiration Date _____

Signature _____

Name _____

Address _____

City, State, Zip _____ North Carolina residents add 4 1/2% sales tax.

For quicker response on credit card orders, call...

Toll Free 1-800-762-7874 (In North Carolina 919-787-7703)

Our Guarantee

Try your copy of PROMAL for 15 days. If you are not completely satisfied, return it to us undamaged and we'll refund your money. No questions asked. Dealer inquiries invited.



SYSTEMS MANAGEMENT ASSOCIATES
 3700 Computer Drive, Dept. GP-1
 Raleigh, North Carolina 27609

Comm.64 Book

GET ONE BASIC BOOK FREE WITH EVERY ORDER

BLIZTEXT 1.1 Wordprocessor for C-64
 This wordprocessor has all the features that you expect from a good wordprocessor plus some additional features. The standard features include:
 Full screen oriented editing with horizontal and vertical scrolling, dynamic formatting, printer control codes that can be imbedded anywhere within the text, for underlining, shift to a different font, and whatever else you printer can do. It works with all printers (parallel, serial, IEEE), single keystroke for disk directory and error channel, global or local search and replace, left and right margin justification, centering, page numbering, footnotes heading, calculations within the text, different screen and border colors definable, copy register to move/duplicate portions of the text, double line spacing, definable line length and width, indent paragraph, text can be saved on disk or cassette, in normal format or in Commodore format; text can be saved including all format commands, or in a formatted form, so that it can be checked by a spelling checker; lines can be up to 250 characters long; 40 columns can be seen at a time.
 The additional features of BLIZTEXT 1.1 are:
 An INCLUDE function for large texts that cannot be held in memory at the same time; you can include text on up to four disk drives. This gives you control over every large text; you can print a whole book that way. About 2000 characters can be in memory at the same time, in addition to that you have room for more.
 Dealer and Distributor inquiries are invited.
ELCOMP PUBLISHING, INC.
 2174 West Foothill Blvd., Unit E, Dept. 36
 Upland, CA 91786
 Phone: (714) 823-8314, Tlx.: 29 81 91

Commodore 64 Tune-up

GET ONE BOOK FREE FROM THIS AD WITH EVERY \$20.00 PURCHASE

The Great Book of Games
 This book contains the listings of 40 programs for the Commodore 64. The first part of the book contains ready to run programs in Commodore BASIC. The second part of the book teaches you in detail, how to take advantage of the powerful new features of your C-64. Features such as color, high-resolution graphics, scrolling, sprites, sound, joystick, and paddles; 144 pages.
 ISBN 3-88963-182-7 \$9.95
 Order-No. 182 (Book) \$9.95
 Order-No. 4888 (Disk) \$19.95
 More on the Sixtyfour
 Machine language for the advanced user. This book contains programs and instructions about such interesting tasks as output of text, the filesystem, RS232 interface, realtime clock; how to add new BASIC commands; hires assistant, diskability, device handlers, centronics interface, screenshot, terminal, data transfer between an Atari and a C-64, A/D converters, etc.
 Order-No. 183 (Book) \$9.95
 Order-No. 4989 (Disk) \$19.95
 (Source and object code plus supervisor monitor)
 How to program your Commodore 64 in Machine Language
 Introduction into the 6502/6510 machine language for the BASIC program pages.
 Order-No. 184 (Book) \$12.95
 Order-No. 4702 (Disk) \$19.95
 (Source code and object code)
 Dealer and Distributor inquiries are invited.
ELCOMP PUBLISHING, INC.
 2174 West Foothill Blvd., Unit E, Dept. 36
 Upland, CA 91786
 Phone: (714) 823-8314, Tlx.: 29 81 91

Comm.64

GET ONE BASIC BOOK FREE WITH EVERY ORDER

MACROFIRE Editor/Assembler for C-64
 This powerful tool for the machine language programmer consists of three parts: full screen oriented editor (similar to the wordprocessor), very fast assembler with macro capability, machine language monitor. The assembler translates in three phases, physical and logical address, macros expanded/text expanded, include function for large source codes, source code can be saved/loaded on disk or cassette from the editor; object code can be saved/loaded from the monitor. Assembler gives list of used and unused labels, physical addresses. Disk or cassette. Comes with book No. 184.
 Order-No. 4963 \$8.00
SIXTY FORTH
 The FORTH is an extended high-FORTH adapted to the Commodore 64. Available on disk only.
 Order-No. 4960 \$39.00
SUPERMAILING for C-64
 This mailing list program allows you to handle up to 1000 addresses on one disk. Each address consists of 9 parameters, these are: name, company, street, city, state, zip-code, code 1, code 2, phone number. You can print labels, or search for any parameter, for example all addresses from California. Available on disk only.
 Order-No. 4962 \$4.00
 Dealer and Distributor inquiries are invited.
ELCOMP PUBLISHING, INC.
 2174 West Foothill Blvd., Unit E, Dept. 36
 Upland, CA 91786
 Phone: (714) 823-8314, Tlx.: 29 81 91

Software Discounters of America



For Orders Only 1-800-225-SOFT*
 Inquiries and PA. 412-361-5291

Open Saturday

Commodore 64 Software

- | | | | |
|---|---|---|--|
| ACCESS | Match Wits (D) \$19 | Suspended (D) \$29 | Cosmic Balance (D) . . . \$25 |
| Beach Head (T/D) . . . \$21 | Math Milingat (D) . . . \$19 | Witness (D) \$23 | Epidemic (D) \$23 |
| Beach Head II Call | Get Rich Series (D) . . . \$99 | Zork I, II or III (D) . . . \$25 | Field of Fire (D) \$25 |
| Raid Over Moscow (T/D) . . . \$26 | MultiDiv (T/D) \$16 | KOALA | 50 Mission Crush (D) . . \$25 |
| ACTIVISION | Murder by Dozen (D) . . \$23 | Touch Tablet w/Painter (D) \$65 | Fortress (D) \$23 |
| Beamrider (D) \$25 | CONTINENTAL | Touch Tablet w/Painter (R) \$75 | Geopolitique 1990 (D) \$25 |
| Decathalon (D) \$25 | FCM (D) \$33 | Home Accountant (D) \$47 | Germany 1985 (D) . . . \$39 |
| H.E.R.O. (D) \$25 | Get Rich Series Call | Home Cataloger (D) \$33 | Knights In Desert (D) \$25 |
| Pitfall II (D) \$25 | Home Accountant (D) \$47 | Keys Call | Pro Tour Golf (D) . . . \$35 |
| River Raid (D) \$25 | CREATIVE | Paint-A-Rhyme (D) . . \$21 | Qwestron (D) \$23 |
| *\$5 Instant Rebate with purchase of 3 titles | Bumblebee (D) \$19 | Programmer's Guide (D) \$13 | RDF 1985 (D) \$23 |
| ARTWORK | Crisis Mountain (R) . . \$21 | Spider Eater (D) . . . \$21 | Rails West (D) \$25 |
| Bridge 4.0 (T/D) \$16 | In the Chips (D) . . . \$19 | MICROLAB | Ringside Seat (D) . . . \$25 |
| Monkymath (T/D) . . . \$18 | Moondund (R) \$21 | Boulder Dash (D) . . . \$21 | Tigers In Snow (D) . . \$25 |
| Strip Poker (D) \$21 | Save New York (R) . . \$21 | Death Caribbean (D) . \$23 | SUBLOGIC |
| BATTERIES INCLUDED | DATASOFT | Dino Eggs (D) \$23 | Flight Simulator II (D) \$35 |
| Buscard II \$135 | Bruce Lee (D) \$23 | Helist (D) \$21 | Night Mission Pinball (T/D) \$21 |
| Checkbook (D) \$21 | Dallas Quest (D) . . . \$23 | MICROPROSE | SYNAPSE |
| 80 Column Board \$145 | Letter Wizard (D) . . \$33 | F-15 (T/D) \$23 | Blue Max (T/D) \$21 |
| Electronic Address Book (D) . . . \$21 | Pooyan (T/D) \$19 | Helicat Ace (D) . . . \$19 | Encounter (T/D) . . . \$21 |
| Home Inventory (D) . . \$21 | DESIGNWARE | Solo Flight (T/D) . . . \$23 | FT. Apocalypse (T/D) . \$21 |
| Mail List (D) \$21 | Creature Creator (D) . \$25 | Spitfire Ace (D) . . . \$19 | Necromancer (T/D) . . \$21 |
| Paperclip (D) \$59 | Mail Maze (D) \$25 | PRECISION SOFTWARE | Pharaoh's Curse (T/D) \$21 |
| Paperclip w/SPELLpak \$79 | Spellicopter (D) . . . \$25 | Superbase 64 (D) . . \$67 | Sentinel (T/D) \$21 |
| Recipes (D) \$21 | States & Traits (D) . \$29 | PROFESSIONAL SOFTWARE | Slamball (T/D) \$21 |
| Spellpak (D) \$33 | EPYX | Dragonriders Pern (D) \$25 | Zaxxon (T/D) \$25 |
| Stamps (D) \$21 | FAX (D) \$19 | Gateway Apsah (R) . \$25 | Zepellin (T/D) \$21 |
| The Consultant (D) . \$67 | Impossible Mission (D) . \$23 | Jumpman (T/D) . . . \$25 | TIMEWORKS |
| BOOKS | Jumpman Jr. (R) . . . \$25 | Oil Barons (D) . . . \$39 | Cave Word Wizard (D) \$23 |
| Book of Adv. Games \$16 | Oil Barons (D) . . . \$39 | Pitstop (R) \$25 | Data Manager (T/D) . \$17 |
| Book of Commodore Software 85 \$13 | Pitstop II (D) Call | Puzzlepanic (D) . . . \$23 | Data Manager 2 (D) . \$33 |
| Commodore 64 User's Encyclopedia \$13 | Summer Games (D) . \$25 | Temple of Apsah (T/D) . . . \$25 | Elect. Checkbook (T/D) \$17 |
| Commodore 64 Color Graphics \$12 | Temple of Apsah (T/D) . . \$25 | Worlds Greatest Baseball (D) . \$23 | Evelyn Wood Reader (D) \$47 |
| Games Commodores Play \$12 | Worlds Greatest Baseball (D) . \$23 | FISHER PRICE | Money Manager (T/D) \$17 |
| Kids and the C64 \$16 | Adventureland I \$9 | Alpha Build (R) . . . \$19 | Programming Kit 1, 2 or 3 (T/D) \$17 |
| Shortcut Through Adventureland I \$9 | Adventureland II (Infocom) \$9 | Dance Fantasy (R) . \$19 | Robbers Lost Tomb (T/D) \$17 |
| Shortcut Through Adventureland II \$9 | BRODERBUND | Hop Along Counting (R) . . . \$19 | Spellbound (T/D) . . . \$17 |
| AE (D) \$21 | Bank St. Writer (D) . \$43 | Linking Logic (R) . . \$19 | Word Writer (D) . . . \$33 |
| Bank St. Writer (D) . \$43 | Castles Dr. Creep (D) \$21 | Memory Manor (R) . \$19 | TRILLIUM |
| Championship Loderunner (D) \$23 | Chopflifer (R) \$25 | Number Tumbler (R) \$19 | Amazon (D) \$23 |
| David's Midnight Magic (D) \$19 | Drol (D) \$23 | Sea & Speller (R) . \$19 | Dragonworld (D) . . . \$23 |
| Gumball (D) \$19 | Gumball (D) \$19 | Bubble Burst (R) . \$19 | Fahrenheit 451 (D) . \$23 |
| Mask of the Sun (D) \$25 | Operation Whirlwind (D) . \$25 | FUTURE HOUSE | Rendezvous w/Rama (D) \$23 |
| Raid on Bungeling Bay (D) \$21 | Seafox (D) \$21 | CPA (D) \$47 | Shadowkeep (D) . . . \$23 |
| Seafox (D) \$21 | Speulunker (D) . . . \$21 | Light Pen (T/D) . . \$19 | TRONIX |
| Stealth (D) \$21 | Whistler's Brother (D) \$19 | Peripheral Vision (D) \$23 | Chatterbee (D) \$25 |
| CBS Add/Subt (T/D) . \$16 | Astro-Grover (D) . . \$33 | Computer SAT (D) . \$59 | Pokersam (D) \$19 |
| Big Bird's Funhouse (R) . . . \$33 | Big Bird's Funhouse (R) . \$33 | HES | S.A.M. (D) \$39 |
| Big Bird's Special Delivery (D) \$23 | Dinosaur Dig (D) . . \$33 | Factory (D) \$16 | WAVEFORM |
| Duck's Ahoy! (R) . . \$23 | Duck's Ahoy! (R) . . \$23 | Graphics Basic (D) \$23 | Musicalc 1 (D) . . . \$35 |
| Ernie's Magic Shapes (R) . . . \$25 | Fractions (T/D) . . . \$19 | HES Modem I . . . \$47 | Musicalc 2 or 3 (D) . \$23 |
| Fractions (T/D) . . . \$19 | Goren Bridge (D) . . \$53 | HES Modem II . . . \$25 | Colorstone Keyboard . \$59 |
| Expansion Board for C-64 \$39.95 | Expansion Board for C-64 \$39.95 | HES Games 84 (D) . \$23 | WINDHAM CLASSICS |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Multiplan (D) . . . \$59 | Below The Root (D) . \$19 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Paint Brush (R) . . \$18 | Gulliver's Travels (D) \$19 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Space Station (D) . \$25 | Swiss Family Robinson (D) \$19 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Turtle Graphics II (D) \$25 | Wizard Of Oz (D) . . \$19 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Type 'N' Write (D) . \$21 | ACCESSORIES |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | INFOCOM | Box Call |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Baltic 85 (D) . . . \$23 | BASF SS, DD . . . \$17/Bx |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Battle Normandy (D) \$25 | Cardco Access Call |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Broadsides (D) . . \$25 | Commodore Dust Covers (All Models) \$6 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Carrier Force (D) . \$39 | Compuserve Starter Kit (5 hrs.) \$23 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Combat Leader (D) \$25 | Compuserve Holdex \$25 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Computer Baseball (D) . \$25 | Disk Case (Voids 50) \$12 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Computer QB (D) . . \$25 | Disk Drive Cleaner . . \$9 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Computer QB (D) . . \$25 | Sakata 13" Color Monitor (free shipping) \$239 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Computer QB (D) . . \$25 | Wico Boss \$12 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Computer QB (D) . . \$25 | Wico Bat Handle . . \$19 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Computer QB (D) . . \$25 | Wico Red Ball . . . \$19 |
| Universal Experimenter Board for C-64 \$39.95 | Universal Experimenter Board for C-64 \$39.95 | Computer QB (D) . . \$25 | Wico Trackball . . . \$29 |

P.O. Box 278—Dept. CG Wildwood, PA 15091

Ordering and Terms: Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. VISA/MASTERCARD accepted with no additional charge for orders shipped to continental U.S.A. Shipping: Continental U.S.A. — Orders under \$100 add \$3; free shipping on orders over \$100. PA residents add 6% sales tax. AK, HI, FPO-APO — add \$5 on all orders. International — add \$15 or 15% of order whichever is greatest. Defective merchandise will be replaced with same merchandise — NO CREDITS! Return must have authorization number (412) 361-5291. Prices subject to change without notice.

1541 FLASH!

It's No Flash in the Pan

For CBM-64 and VIC owners only:

This is just 1 of 20 pages of the newest and biggest Skyles catalog, hot off the press.

We know you'll want this page, in its full 7 x 10 splendor, and another 19 pages of peripherals, software and books that will make your CBM-64 or VIC computer even nicer to live with. So, if we missed

sending you your very own copy within the last few weeks, call us at **(800) 227-9998** (unless you live in California, in which case call **(415) 965-1735**.)

The new Skyles Electric Works 1541 Flash! loads and saves programs and files to your Commodore 64 three times faster than an unenhanced Commodore disk drive can. Faster than any other Commodore single disk drive with an IEEE interface.

It gives your 1541 disk drive the speed of much more expensive drives—at three times its normal speed! The 1541 Flash! is faster than the normal disk drives and any parallel interface, faster than the Commodore 2051. The Skyles Electric Works 1541 Flash! is one of the most exciting time-saving devices we've ever seen.

■ It's Permanent

The Flash! is a permanent firmware installation in your Commodore 64 and 1541 disk drive. It has both a software (ROM) and a hardware component.

■ It's Transparent

Best of all, the 1541 Flash! is transparent. Computer operations all remain unaffected as it speeds up every disk-related function. And there is nothing new to learn for the Flash! No special tricks or techniques. Once it's in, just watch it go. We have tested it on well over one hundred programs and it loads spectacularly fast.

■ It's Flexible

And it's flexible. The 1541 Flash! adds 21 extra commands for the Commodore 64 user. These include a built-in "DOS WEDGE," eight editing and fast-transfer commands for the advanced programmer. Here is an example of what it can do: For programs that usually load with a "..." 8.1" command, just hit Shift/Run/Stop. A large spreadsheet program like **BUSICALC 3** then loads in about 25 seconds. Through keyboard commands or a hardware "off" switch, you can even return to the old, slow loading method, if for some reason you really want to. Or you can ignore all its commands, and just enjoy the speedy disk operations.

■ It's Serious

But if you are really serious about programming, the 1541 Flash! is a gold mine. For example, the manual will show you how to write software allowing data transfer to and from the disk drive at speeds up to 10 times the normal.

■ It's Easy

Installation of the 1541 Flash! consists of plugging a small assembly inside the Commodore 64 and two small assemblies plug into the Commodore 1541. Except for a small percentage of Commodore 64s, no soldering is required. Assembly instructions include detailed pictures and drawings. And installation is—well, a flash.

■ It's Available

Call Skyles Electric Works to place your order or to get more info on the 1541 Flash! Hurry up, though. They may be gone before you know it.
1541 FLASH! C-64/1541 **\$89.95***

*There is an additional \$3.50 US and Canada, \$10.00 Europe and Asia, shipping charge per order. California residents add sales tax.

From Skyles Electric Works, the oldest and largest professional specialists in the business.



Skyles Electric Works
231-E S. Whisman Road
Mountain View, California 94041



HAVE YOU BEEN DRIVEN CRAZY
TRYING TO BACKUP YOUR EXPENSIVE
SOFTWARE? NOW YOU CAN RELAX!

DITTODISK-64™

NEW

VIC & 64

DITTODISK 64 is a utility program that has been tested and found to be capable of copying most protected disks produced by the major software houses. A notable attribute of this copy program is its lack of a large manual. There are no menus and no disk analysis routines. The screen prompts will be all that you'll need to get you through 99+% of your copying.

BE A COPY C A D (CASSETTE AIDED DUPLICATOR) NOW YOU CAN MAKE BACKUP COPIES OF ALL THE COSTLY, NON-SAVEABLE CASSETTE PROGRAMS YOU BOUGHT.

OUR BACKUP V1.0 UTILITY PROGRAM WILL LET YOU MAKE DUPLICATES THAT RUN.

BACKUP V1.0 WILL WORK WITH A STANDARD 5K UNEXPANDED VIC MEMORY EXPANSION IS REQUIRED TO COPY PROGRAMS LONGER THAN 3K BYTES.

TAPE

\$24.95

**ORDERING
INFORMATION**

ADD \$2.00 PER ORDER FOR SHIPPING.
WE ACCEPT VISA, MASTERCARD, CHECKS, M.O.
C.O.D. ADD \$3.00 EXTRA.

California Residents, Add 6%

Sales Tax to Orders

DISK ONLY
\$39.95

**THE BEST
YOU CAN BUY**

Dealers inquiries invited!!!



6201 C Greenback Lane

SOFTWARE PLUS

(916) 726-8793



Citrus Heights, CA 95610

COMPUTER ROAD ATLAS

TAKE TRIPS WITH COMPUTER LISTINGS SHOWING THE BEST ROUTE



ROADSEARCH IS A COMPUTERIZED ROAD ATLAS that helps you plan trips. Enter the departing city and the destination city. ROADSEARCH computes the shortest route or other routes more suitable to your needs. Printout includes detailed driving directions, mileage, time, fuel and more.

ROADSEARCH contains a roadmap of 406 cities/road junctions and 70,000 road miles. ROADSEARCH-PLUS (extra cost) also contains a ROADMAP DEVELOPMENT SYSTEM which lets you customize your roadmap. Add local roads, favorite shortcuts, new destinations, etc. ROADSEARCH-PLUS lets you add up to 50 towns/road junctions anywhere in North America.

EASY TO USE. Back-up copies allowed. Specify Apple III/IIe or Commodore-64. All Columbia Software carries a 15 DAY MONEYBACK GUARANTEE.

STOP USING THE "OLD FASHIONED" METHOD of tracing routes on a map. It is tedious, time consuming, and inaccurate. Use your computer to plan your next route. The printed output is an excellent companion on any trip.

ORDER ROADSEARCH OR ROADSEARCH-PLUS from your dealer or directly from Columbia Software. ROADSEARCH-PLUS is \$74.95 and ROADSEARCH is only \$34.95. Add \$1.50 for shipping and handling. MD residents add 5% state tax.

MAIL COUPON OR CALL TODAY

Columbia Software (301) 997-3100
Box 2235W, Columbia, MD 21045

Please send me ROADSEARCH-PLUS for \$74.95 Apple III/IIe
 ROADSEARCH for \$34.95 for C-64 disk

Add \$1.50 shipping. If I am not satisfied, I may return it for a full refund.

check Master Charge VISA

Card Number _____ Expiration Date _____

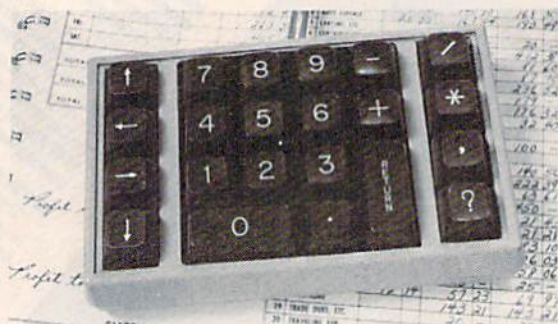
NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

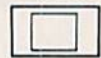
ORDERS: 1-800-835-2246, Ext. 172

Your **1, 2, 3** choice



CP Numeric Keypad for Commodore 64 and VIC-20, Model: NKP Deluxe

Yes, you have the choice. Different jobs require different tools. That's why we provide you with three models of Numeric Keypads to choose from for your Commodore 64 and VIC-20. These Numeric Keypads are designed with top quality, low profile key switches for smooth, reliable and low-cost data entry. They easily connect in parallel with the computer keyboard. No software is required. They are 100% compatible with all the programs. The setup is simple, the usage is comfortable, and the price is very affordable.



MODEL: NKP \$59.95



MODEL: NKP PLUS \$64.95



MODEL: NKP DELUXE \$69.95

Computer Place (213) 325-4754
23914 Crenshaw Blvd. Torrance, CA 90505

Dealer inquiries welcome
Commodore 64 and VIC-20 are trademarks of Commodore Business Machines, Inc.



SAVE ON THESE IN-STOCK PRINTERS

GEMINI 10X \$249.00

OVER 2000
SOFTWARE TITLES
IN STOCK



PRINTER INTERFACING	
APEFACE	\$59.95
TYMAC CONNECTION	CALL
AXION	CALL
MICROBITS	CALL

BLUE CHIPS	
M12010	\$279.00
M12010 C-64	\$279.00
D4015	\$1399.00

LEGEND	
880	\$259.00
1000	\$279.00
1200	CALL
1500	CALL
1081	CALL

STAR MICRONICS	
GEMINI 15X	\$359.00
DELTA 10	\$375.00
DELTA 15	\$475.00
RADIX 10	\$509.00
RADIX 15	\$559.00
POWERTYPE	CALL
SWEET P (MODEL 100)	\$549.00
STX 80	\$149.00

OKIDATA	
80	CALL
82A	\$299.00
83A	\$569.00
84	\$959.00
92	\$399.00
93	\$685.00

MANNESMANN TALLY	
SPIRIT 80	\$299.00
MTL-160L	\$559.00
MTL-180L	\$775.00

CARDCO	
LQ1	\$449.00
LQ2	\$279.00
LQ3	\$339.00
PRINTER INTERFACE	\$39.75
PRINTER INTERFACE W/ FULL GRAPHICS	\$65.75

EPSON	
FX-80	\$259.00
FX 80FT	\$299.00
FX-80	\$439.00
FX-100	\$639.00

PANASONIC	
1090	\$229.00
1091	\$299.00
1092	\$439.00

Citoh	
Gorilla GX100	\$119.00
Gorilla Serial	\$129.00
Prowriter 8510	\$315.00
Prowriter II	\$575.00
8600	\$899.00
Starwriter	\$929.00
Printmaster	\$1199.00
Sheet feeder	\$425.00
620	\$929.00
630	\$1699.00
8510Sp	\$499.00
8510SCP	\$559.00
A10 Letterqual	\$499.00

NEC	
NEC 8025	\$699.00
NEC 8027	\$359.00

MODEMS

MITEY MO79.95

MICROBITS	
MPP1000C	\$109.00

PRINTING PAPER

3000 SHEETS	
FANFOLD	\$42.75
1000 SHEETS	
FANFOLD	\$19.75
1000 SHEET LETTER	\$21.95
200 SHEETS LETTER	\$8.99
150 RAGSTATIONARY	\$10.99
MAILING LABELS (1in.)	\$9.95
14 x 11 1000 FANFOLD	\$24.75

DISKETTES

SKC	
SKC-SSSD	\$14.75
SKC-SSDD	\$17.75
SKC-DSDD	\$21.75

ELEPHANT	
5 1/4"SSSD	\$15.99
5 1/4"SSDD	\$17.99
5 1/4"DSDD	\$22.99

MAXELL	
5 1/4"MD-1	\$19.95
5 1/4"MD-2	\$24.99

CERTRON CASSETTES	
CC-10 (12)	\$15.99
CC-20 (12)	\$17.99

MONITORS



NEC	
JB 1260 Green	\$ 99.00
JB 1201 Green	\$145.00
JB 1205 Amber	\$145.00
JC 1215 Color	\$255.00
JC 1216 RGB	\$399.00
JC 460 Color	\$349.00

SAKATA	
SC-100 Color	\$229.00
STSI Tilt Stand	\$ 35.00
SG 1000 Green	\$ 99.00
SA 1000 Amber	\$109.00

AMDEK	
300 Green	\$139.00
300 Amber	\$149.00
310 Amber-IBM	\$159.00
Color I Plus	\$259.00
Color 4T-IBM	\$589.00

TAXAN	
210 Color RGB	\$259.00
100 Green	\$115.00
105 Amber	\$125.00
400 Color RGB	\$295.00
410 Color RGB	\$349.00
420 Color RGB-IBM	\$459.00
121 Green-IBM	\$145.00
122 Amber-IBM	\$149.00

ZENITH	
ZVM122A Amber	\$ 95.00
ZVM123G Green	\$ 85.00
ZVM124 Amber-IBM	\$129.00
ZVM131 Color	\$275.00
ZVM133 RGB	\$389.00
ZVM135 Composite	\$449.00
ZVM136 HI RES Color	\$589.00

GORILLA	
12" Green	\$ 82.00
12" Amber	\$ 89.00

SUB LOGIC-64

Flight Simulator II	\$32.75
Night Mission Pinball	\$22.75

EASTERN HOUSE-64	
Rabbit Rom.	\$34.75
TelStar 64	\$39.95
Assembler Rom.	\$19.95

KOALA-64	
Koala Pad	\$69.95
Geometric Design	\$22.50

RESTON SOFTWARE-64	
Miner 2049er.	\$27.95

PROFESSIONAL SOFTWARE

Word Pro 64/Spell	\$62.50
-------------------	---------

PERSONAL PERIPHERALS-64

Super Sketch Graphics	\$39.95
Joystick	\$7.75

SCARBOROUGH-64

Mastertype	\$27.75
Songwriter	\$27.75
PHI Beta Filer	\$32.75

TIMEWORKS-64

Electronic Checkbook	\$18.75
Star Battle	\$18.75
Data Manager	\$18.75
Wall St. Manager	\$18.75

SYNAPSE-64

Blue Max	\$22.75
Shamus	\$22.75
Shamus II	\$22.75
Zeppelin	\$22.75
Zaxxon	\$22.75

CONTINENTAL-64

Home Accountant	\$44.75
Tax Advantage	\$35.75
C-64 Users Encyclopedia	\$12.50

MICROPROSE-64

Solo Flight	\$21.75
-------------	---------

ALIEN GROUP-64

Voice Box	\$99.00
-----------	---------

STRATEGIC SIMULATIONS-64

Knights of the Desert	\$26.75
Eagles	\$26.75
Computer Baseball	\$26.75
Ringside Seat	\$26.75

EPYX-64

Jumpman	\$27.75
Jumpman Jr.	\$27.75
Pitstop	\$27.75
Gateway to Apschai	\$27.75
Temple of Apschai	\$27.75

BRODERBURD-64

Bank St. Writer	\$39.95
Choplifter	\$27.95
Seafox	\$22.95
Spare Change	\$22.95
Lode Runner	\$22.95

CARDCO-64

C/?G Printer Interface	\$69.75
C/?B Printer Interface	\$39.75
CK/1 Numeric Keypad	\$34.75
DC/1 Cassette Recorder	\$39.75
CB/5 5-Slot Expansion	\$54.00
CR/1 Light Pen	\$29.75
CE/1 Cassette Interface	\$29.75
C/02 Write Now	\$34.75
D/01 Mail List	\$26.75
D/04 Spell Now	\$26.75

HESWARE-64

Microsoft Multiplan	\$59.95
Omni Writer	\$39.95
Turtle Toyland Jr	\$21.95
Time & Money Mgr	\$39.95
Paint Brush	\$12.95
Hes Games	\$24.95
The Factory	\$21.95
Minn. Fats Pool	\$19.95

INFOCOM-64

Enchanter	\$32.75
Infidel	\$32.75
Planetfall	\$32.75
Witness	\$32.75
Sorcerer	\$32.75

SPINNAKER-64

Alphabet Zoo	\$23.75
Kindercomp	\$23.75
Kids On Keys	\$23.75
Facemaker	\$23.75
Delta Drawing	\$26.75
Fraction Fever	\$23.75
Cocmic Life	\$23.75
Up For Grabs	\$26.75

CALL 800-233-8760

LYCO COMPUTER

AMERICA'S MAIL ORDER HEADQUARTERS
LYCO COMPUTER
WORLD'S LEADER IN SALES & SERVICE

CUSTOMER SERVICE 1-717-327-1825
POLICY

Risk Free -
No deposit on C.O.D. orders; free shipping on prepaid cash orders within the continental U.S.
APO, FPO, and international orders add \$5.00 plus 3% for priority mail service. PA residents add sales tax. Advertized prices show 4% discount for cash; 4% for Master Card or Visa . . .

COMMODORE 64 SOFTWARE

Access

Beach-Head	(D)23.95
Neutral Zone	(D)23.95
Raid Over Moscow	(D)29.95
Master Composer	(D)26.95
Atari Soft All Titles	Call
Commodore	
Logo	(D)59.95
Pilot	(D)42.95
Pet Emulator	(D)18.95
Intro to Basic I	(T)18.95
Screen Editor	(D)18.95
Super Expander VSP	(D)26.95
The Manager	(D)49.95
Simons Basic	(C)15.95
Music Composer	(D)18.95
Nevada Cobol	(D)49.95
Nevada Fortran	(D)49.95
Assembler	(D)37.95
Bonus Pack	(D)16.95
CP/M2.2 System	(C)157.95
Easy Script	(D)44.95
Easy Mail 64	(D)18.95
Easy Spell 64	(D)18.95
Easy Calc 64	(D)64.95
Easy Lesson/Quiz	(D)18.95
Easy Finance (1-5)	(D)18.95
Magic Desk	(D)54.95
Zork(1-3)	(D)37.95
Suspended	(D)37.95
Starcross	(D)30.95
Deadline	37.95
Voice Synthesis	(C)59.95
Accounting Series (ea.)	(D)49.95

Continental	
Home Accountant	(D)50.75
Tax Advantage	(D)40.60
FCM	(D)39.95
Creative Software	
Household Fin.	(D,T)19.95
Home Inv.	(D,T)19.95
Loan Analyzer	(D,T)19.95
Cymbal	
English/Spanish	(D)34.95
Science	(D)34.95
History/Geography	(D)34.95
Music Theory	(D)34.95
Mathematics	(D)34.95
Entertainment Tonight	
Trivia	(D)25.95
Epyx	
Pitstop	(C)27.00
Temple of Apshei	(D)27.00
Jumpman	(D,T)27.00
Gateway to Apshei	(D)27.00
Jumpman Jr.	(C)27.00
Oil Baron	39.95
Impossible Mission	(D)25.95
Greatest Baseball	(D)25.95
Summer Games	(D)29.95
Silicone Warrior	(D)25.95
Hes Software	
Hes Mon 64	(C)27.00
Turtle Graphics II	(C)40.60
Time Money Mgr.	(D)51.00
Omniwriter	(D)24.20
Multiplan	(D)59.95

Hes Writer 64	(C)30.45
Gridrunner	(C)20.95
64 Forth	(C)49.95
Hes Games '84	(D)27.95
Minnesota Fats Pool	(C)20.45
Hes Modem I	(D)46.95
Microprose	
Helicat Ace	(D)23.95
Solo Flight	(D)26.95
Nato Commander	(D)26.95
F-15 Eagle	(D)36.95
subLogic	
Flight Simulator II	(D)44.95
Night Mission Pinball	(D)26.95
Spinnaker	
Alf in the Color Caves	(C)27.95
Bubble Burst	(C)27.95
Juke Box	(C)27.95
Kidwriter	(D)23.95
Face Maker	(D,C)23.65
Hey Diddle Diddle	(D)20.30
Kindercomp	(D,C)20.30
Snooper Troops	(D)27.00
Fraction Fever	(C)23.65
Amazing Thing	(D)27.00
Alphabet Zoo	(D)23.65
Kids on Keys	(D,C)23.65
Delta Drawings	(C)27.25
Up for Grabs	(C)27.25
Cosmic Life	(C)23.65
Scarborough	
Songwriter	(D)35.95
Master Type	(D)31.95

Story Machine	(C)27.25
Trains	(D)27.25
Aerobics	(D)30.95
Synapse	
Ft. Apocalypse	(D,C)23.70
Shamus	(D,C)23.70
Blue Max	(D,C)23.70
Zaxxon	(D)27.95
SSI	
Combat Leader	(D)29.00
Knights of the Desert	(D)29.00
Computer Baseball	(D)29.00
Eagles	(D)29.00
Ring Side Seat	(D)29.00
RFD 1985	(D)29.95
Germany 1985	(D)34.95
Golf	(D)29.95
Broadsides	(D)31.95
Electronic Arts	
One on One	(D)37.00
Music Construction	(D)37.00
Sky Fox	(D)37.00
Miscellaneous	
Doodle	(D)31.95
Word Pro 3+	(D)76.95
Trivia Fever	(D)33.95
Paper Clip/w Spell Pack	(D)89.95
Orical	(D)79.95
Musicalc	(D)41.95
Mr. Robot	(D)26.95
Super Base 64	79.95
Fisher Price	31.95
Trillium Adventures	33.95
Sam	49.95
Star League Baseball	26.95

64

Hardware

Commodore 64	
Executive 64	812.00
1541 Disk Drive	
1530 Datasette	
MPS 801 Printer	
1650 Automodem	
1702 Color Monitor	
1600 Modem	
64 Prog. Ref. Guide	
BASF (Sale)	17.95
Total Telecom	99.95
Joysticks	
Wico	
Command Ctrl	19.50
Wico "Boss"	13.50
Wico Red Ball	20.95
Wico Power Grip	20.95
Wico Power Grip	20.75
Cardo	
Card-G	68.25
Card B	37.85
Cass. Interface	33.25
5 Slot Expansion	60.25
Numeric Keypad	39.95
GEMINI Printers	
O'SULLIVAN	
Furniture	
MAXTRON	
Datasettes	

To order, call toll free or send by mail. We accept Visa, Master Card, American Express or Money Orders. Personal checks allow two weeks to clear. Add \$2.00 for shipping with an additional \$1.65 for C.O.D. orders. Other countries please call on shipping with a minimum of \$10.00. All prices are subject to change. Credit and exchange only please. For return authorization call [214] 759-8937. [TEXAS] Please add 5.8% new tax

ATARI, APPLE, IBM, SOFTWARE LISTS AVAILABLE

For further information and inquires call 214-759-8937

FOR ORDERS ONLY CALL TOLL FREE

Outside Texas

Inside Texas

1-800-527-8698

1-800-442-8717

Software Warehouse outlet

P.O. BOX 2511
LONGVIEW, TX.
75606

Only 10% of Software we carry is listed on this ad. Call if there is a title you need for all computers. We are here to serve you!

ALMOST-FREE-SOFTWARE

FOR VIC 20 AND COMMODORE 64

10 SELECTIONS FOR \$25 FOR THE VIC-20. ALL SELECTIONS RUN ON AN UNEXPANDED VIC-20 AND ARE SUPPLIED ON CASSETTE TAPE OR DISK.

PAK I	PAK II	PAK III	PAK IV	PAK V	CHECK YOUR SELECTION		
Tiny Kong	UFO Attack	Checkers	Budget	Speed Read	VIC 20	Disk	Cassette
Race	Robot Chase	Mastermind	Checkbook	Algebra	Pak I Games	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Depth Charge	Fring Tank	Othello	Inventory	Math Drill	Pak II Games	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Star Chase	Money Manager	Letter Squares	Car Cost	Long Division	Pak III Combination	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Deflection	Ping Pong	Mimi Golf	MailList	Typing Drill	Pak IV Math Pak	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Forest Driver	Pinball	Artillery	Mortgage Calc	Chemistry	Pak V Edu Pak	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Arrow	Dam Buster	Blackjack	Date Book	Metric Drill	Individual Selection:		
Snake	Crazy Balloon	Dragon Maze	Recipe Flier	Capitals	1		\$9.95
Freighter	Moon Lander	Deadly Maze	Price List	Presidents	2		\$9.95
Star Wars	Invaders	Chuck A Luck	Monthly Report	Cash Register	3		\$9.95

INDIVIDUAL SELECTIONS ARE \$9.95

10 SELECTIONS FOR \$25 FOR THE COMMODORE 64. ALL SELECTIONS RUN ON THE COMMODORE 64 AND ARE SUPPLIED ON CASSETTE OR DISK.

PAK I	PAK II	PAK III	PAK IV	PAK V	PAK VI	CHECK YOUR SELECTION		
Backgammon	Ato	Monopoly	Decimals	Vectors	Grammar	Commodore	Disk	Cassette
Monopoly	Blackjack	Magic Piano	Percent	Planes	Antonyms	Pak I Games	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Hangman	Concentration	Biorhythm	Division	Lines	Definition	Pak II Games	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
U Boat	Quick Reaction	Time Card	Arithmetic	Conics	Speed Read	Pak III Combination	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Murder Mansion	Lem	Titrate	Dart	Linear Systems	Q's and Z's	Pak IV Math Pak	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Yahtzee	Labyrinth	Murder Mansion	Fractions	Matrix Solution	Spelling	Pak V Math Pak	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Master Mind	Frog	Microtyping	Powers	Triangle Solving	Mad Lib	Pak VI Combination	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$25.00
Draw Poker	Word Chess	Hawai	Integers	General Anova	Microtyping	Individual Selection:		
Skeet	Checkers	Ferry	Hex Demo	Heat Solver	Word Ladder	1		\$9.95
Limerock	Artillery	Date Book	Small Math	Root Finder	Computer Poetry	2		\$9.95
						3		\$9.95

INDIVIDUAL SELECTIONS ARE \$9.95

Name _____
 Address _____
 City _____ State _____ Zip _____
 Master Card# _____ Exp Date _____
 Visa # _____ Exp Date _____
 Check or Money Order Enclosed
 Signature _____

Mail Check or Money Order to:

Almost-Free-Software
 78 Main St.
 Littleton, N.H. 03561
 Or Call: (603) 444-2668 Days 9AM-5PM
MONEY BACK GUARANTEE

ROBOTS

Let NOMAD introduce you to the AGE OF PERSONAL ROBOTS
THE NOMAD ROBOT! AFFORDABLE! FUN! EDUCATIONAL!

IS NOMAD INTELLIGENT?

YES! Your C-64 or VIC is NOMAD's brain.

CAN NOMAD MOVE ABOUT?

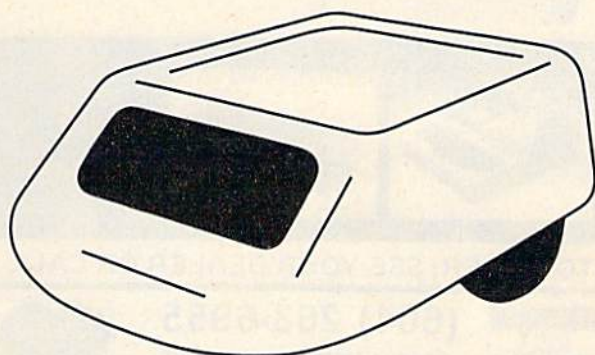
YES! NOMAD accurately travels forward, reverse, and pivots left and right using industrial type stepper motors.

CAN NOMAD SEE?

YES! NOMAD has ultrasonic sight, ranging and motion detection capabilities.

DOES NOMAD COME WITH SOFTWARE?

YES! NOMAD comes complete with ready to run software including a friendly robot language for creating your own programs.



\$179.95

HOME CONTROL

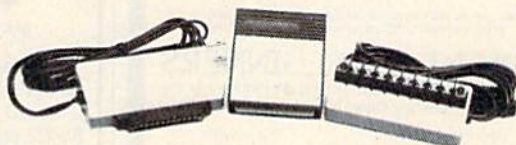
HOME SECURITY AND ENERGY MANAGEMENT PRODUCTS

VIController. Wireless home control using BSR or Leviton receiver modules. Software included. \$69.95

COMclock/AB Autoloads and runs program at power-up. Battery backed up clock. (C-64 only) \$69.95

COMsense. Provides 4 open/close and 2 analog inputs. Great for security \$69.95

SUPER SCHEDULE PLUS Control software utilizing above three products. (C-64 only) \$19.95



SPECIAL
PACKAGE
PRICE

\$199.95

SPEECH

COMVOICE! THE EASY TO USE SPEECH SYNTHESIZER FOR THE C-64

SPEECH IS AS EASY AS 1-2-3!

1) Plug COMvoice in.

2) Turn computer on.

3) Type SPEAK "HELLO, HOW ARE YOU"

AS EASY TO USE AS A PRINT STATEMENT!

\$99.95



W/EXTERNAL SPEAKER \$139.95

EDUCATIONAL DEMO & AARDVARK ADVENTURE SOFTWARE AVAILABLE

GENESIS COMPUTER CORPORATION • P.O. BOX 152 • HELLERTOWN, PA 18055

DEALER INQUIRIES INVITED • (215) 861-0850 • MC & VISA Accepted

VIC-20 C-64 COMPUTER PROTECTION \$14.95

KEYBOARD COVER & TRAY

- FEATURES OF COMPUTER KEYBOARD COVER**
- For use on both Commodore 64 and Vic-20 keyboards
 - Easy to install & remove
 - No disturbance to your computer connections
 - No need to turn off your system when installing or removing



A. USE AS A COVER.
Simply slide the cover over the keyboard. The cover is made of a soft, flexible material that will conform to the shape of your keyboard. It is easy to remove and does not damage the keyboard.

B. USE AS A SOFTWARE TRAY & ORGANIZER.
The tray is made of a sturdy material and is designed to hold software disks and manuals. It is easy to use and will keep your software organized and protected.

TO ORDER: SEE YOUR DEALER OR CALL



(604) 263-6955

VISA-MASTERCARD OR MONEY ORDER
ADD \$1.85 SHIPPING & HANDLING

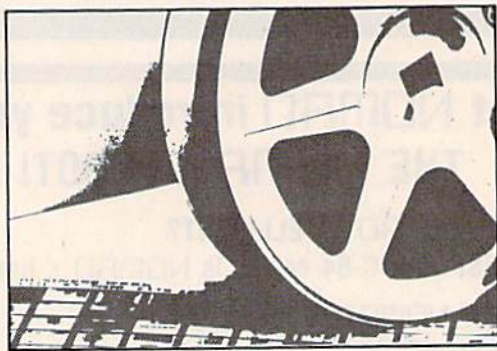


SEND MAIL ORDERS TO:

WINMAR ENTERPRISES LTD.
2307A WEST 41st AVENUE
VANCOUVER, B.C. CANADA V6N 3B8

PHONE ORDERS SHIPPED SAME DAY - DEALER INQUIRIES INVITED
OUTSIDE NORTH AMERICA & CANADA - SHIPPING \$5.00 EXTRA

This Publication is available in Microform.



University Microfilms International

Please send additional information

for _____ (name of publication)

Name _____

Institution _____

Street _____

City _____

State _____ Zip _____

300 North Zeeb Road, Dept. P.R., Ann Arbor, Mi. 48106

ROCKNEY DISK UTILITIES

FOR COMMODORE 64 WITH ONE OR MORE 1541 DISK DRIVES
A Menu-driven 100% Machine Language Package that performs all of the standard DOS functions plus many new utilities.

GREAT FOR BEGINNERS
Simply select a function from the menu, fill in the form, and Rockney Disk Utilities does the rest!

- | | |
|-----------------------|---------------|
| Rename Diskette | New Diskette |
| Concatenate Files | Trace Files |
| (BASIC programs too!) | Copy Files |
| Un-Scratch Files | Print Screen |
| Copy Diskette | Edit Sector |
| (One or two drives) | Directory |
| Display Sector | Display BAM |
| (Hex and ASCII) | Rename Files |
| Validate Diskette | Scratch Files |

MAKES A GREAT GIFT!!



ROCKNEY DISK UTILITIES
Box 5795
Derwood, MD 20855

PLEASE SEND ME Rockney Disk Utilities. I am enclosing \$24.95.
 check money order

Name _____

Address _____

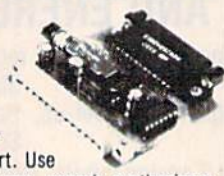
City _____ State _____ Zip _____

C-64 / VIC-20 RS-232 INTERFACE

\$ 39 95

MFJ-1238

Provides RS-232 voltage conversion for C-64/VIC-20 serial port. Use RS-232 printers, modems, speech synthesizers, other peripherals. Switch reverses transmit/receive lines. Use as null modem. 25 pin RS-232 connector. Plugs into user's port. 2 1/4 x 2 1/4 inches.



MODEM

\$ 49 95

MFJ-1237

High performance Texas Instrument single chip design. For C-64/VIC-20. Plug into user port. For single or multiline phones. Plugs into phone base. 300 baud. Direct connect, Originate/Answer Full duplex, Carrier detect LED, Crystal controlled. Includes Basic listing of Terminal Program.



Order from MFJ and try it. If not delighted, return within 30 days for refund (less shipping).
One year unconditional guarantee.

Order yours today. Call toll free 800-647-1800. Charge VISA, MC. Or mail check, money order.

CALL TOLL FREE . . . 800-647-1800
Call 601-323-5869 in MS, outside continental USA.

MFJ ENTERPRISES INCORPORATED
921 Louisville Road, Starkville, MS 39759

FOR YOUR COMMODORE 64

THE DOCTOR IS IN!



Meet ELIZA, the computer psychotherapist. Created at MIT in 1966 to run on a large mainframe, ELIZA has become the world's most celebrated artificial intelligence program. ELIZA will analyze any statement you enter and respond in true Rogerian fashion - and her remarks are often amazingly appropriate! Unlike the stripped down versions you may have seen, our ELIZA has

retained the full power and range of expression of the original mainframe program. Best of all, ELIZA comes with the complete Source Program (written in BASIC) ... anyone, even a beginner, can easily customize ELIZA's responses. So next time people ask you what your computer can do, bring out ELIZA and show them!

ONLY \$45

Please add \$3.00 for shipping and handling. (California residents add 6 1/2 % sales tax.) "Specify disk or cassette"

Checks, MasterCard, and VISA accepted



"You'll be impressed with Eliza ... a convincing demonstration of artificial intelligence" -PC magazine

Artificial Intelligence RESEARCH GROUP

921 N. La Jolla Ave., Dept. G, Los Angeles, CA 90046
(213) 656-7368 • (213) 654-2214

ALL THE BEST PRICES

Commodore

SX-64 PORTABLE

Call for CBM 4 plus **\$839**



M-801 Dot Matrix Parallel.....	\$219.00
MCS 801 Color Printer.....	\$499.00
1520 Color Printer/Platter.....	\$129.00
1630 Datasette.....	\$89.99
1641 Disk Drive.....	\$249.00
1600 Vic Modem.....	\$59.99
1610 Vic Term 40.....	\$59.99
1650 Auto Modem.....	\$89.99
1702 Color Monitor.....	\$249.00
DPS Daisywheel Printer.....	\$459.00
Desk Organizer Lock.....	\$49.99
1311 Joystick, each.....	\$4.99
1312 Paddles.....	\$11.99
1110 VIC 8K.....	\$42.99
1111 VIC 16K.....	\$69.99
IEEE/RS 232 Interface.....	\$42.99
1211 Super Expander.....	\$53.99

Commodore 64.....\$199
VIC 20.....CALL

COMREX	
ComWriter II Letter Quality.....	\$449.00
EPSON	
BX-80, RX-SOFT, RX-100, FX-80, FX-100 CALL	
JUKI	
8100.....	\$469.00
MANNESMAN TALLY	
180L.....	\$589.00
180L.....	\$749.00
Spirit 80.....	\$259.00

MONITORS	
AMDEK	
300 Green.....	\$129.00
300 Amber.....	\$149.00
New Color 300.....	\$269.00

BMC	
1201 (12" Green).....	\$88.99
9191 Plus Color.....	\$249.00

GORILLA	
122" Green.....	\$88.99
12" Amber.....	\$95.99

NEC	
JB 1201 Green.....	\$139.99
JB 1205 Amber.....	\$149.99
JB 1216 Color.....	\$259.00

SAKATA	
80-100 Color.....	\$269.00
SG-1000 Green.....	\$129.00
80-1000 Amber.....	\$139.00

TAXAN	
100 12" Green.....	\$125.00
105 12" Amber.....	\$119.00

USI	
P1 1. 9" Green.....	\$99.99
P1 2. 12" Green.....	\$119.99
P1 3. 12" Amber.....	\$129.00
P1 4. 9" Amber.....	\$119.99
1400 Color.....	\$249.99

ZENITH	
ZVM122 Amber.....	\$99.99
ZVM123 Green.....	\$89.99

PERSONAL PERIPHERALS	
Super Sketch Graphics Pad.....	\$39.99

KOALA	
C64 Koala Pad ROM.....	\$79.99

MSD DRIVES	
SD 1 Disk Drive.....	\$359.00
SD 2 Disk Drive.....	\$589.00

CARDCO	
Light Pen.....	\$32.99
3 Slot VIC Expansion Interface.....	\$32.00
6 Slot Expansion Interface.....	\$79.99
Cassette Interface.....	\$29.99
Parallel Printer Interface.....	\$49.99
Parallel Interface w/Graphics.....	\$69.99
Cassette Deck.....	\$39.99

ORANGE MICRO	
Grappier CD Interface.....	\$119.00

TYMAC	
C64 Printer Interface.....	\$99.99

PRINTERS	
C. ITOH	
Prowriter 8510P.....	\$339.00
Prowriter 1550P.....	\$599.00
A10 (18 epsi Son of Starwriter).....	\$569.00
F10-40 Starwriter.....	\$949.00
F10-55 Printmaster.....	\$1249.00

NEC	
8027 Dot Matrix.....	\$379.00

OKIDATA	
82, 83, 84, 92, 93, 2380, 2410.....	CALL

OLYMPIA	
Compact 2.....	\$479.00
Compact RO.....	\$509.00

SMITH CORONA	
TP-1000.....	\$449.00

SILVER REED	
500 Letter Quality.....	\$449.00
580 Letter Quality.....	\$549.00
770 Letter Quality.....	\$889.00

TOSHIBA	
1340.....	\$829.00
1351.....	\$1369.00

TRANSTAR	
120P.....	\$469.00
130P.....	\$649.00
315 Color.....	\$159.00

SOFTWARE

ATARISOFT (C-64/VIC)	
Dig Dug.....	\$34.99
Defender.....	\$34.99
Robotron 2084.....	\$34.99
PacMan.....	\$34.99
Donkey Kong.....	\$34.99
Centipede.....	\$34.99
StarGate.....	\$34.99

COMMODORE (64)	
C-64 Reference Guide.....	\$18.99
EasyCalc.....	\$65.00
Easy Finance I, II, III, IV.....	\$19.99
Easy Mail.....	\$19.99
Easy Script.....	\$39.99

CBS (64)	
Addition & Subtraction.....	\$18.99
Linear Equation.....	\$18.99
Multiplication & Division.....	\$16.99
Quadratic Equations.....	\$16.99

CONTINENTAL SOFTWARE (64)	
The Home Accountant.....	\$49.99

OSA (64)	
PractiCalc.....	\$39.99
PractiFile.....	\$39.99

DESIGNWARE (64)	
Crypto Club.....	\$29.99
Trap-a-Zoid.....	\$29.99

DYNATECH (64)	
Codewriter.....	\$75.99

ELECTRONIC ARTS (64)	
Pinball Construction.....	\$29.99
Cut & Paste.....	\$39.99
Hard Hat Mack.....	\$75.99

EPYX (6-64/VIC)	
Temple of Apsal.....	\$29.99
Upper Reaches of Apsal.....	\$16.99
Jumpman Junior.....	\$29.99

HES (64)	
Tri math.....	\$22.99
The Pit.....	\$12.99
Ghost Manor.....	\$12.99
Pool Challenge.....	\$14.99
Hes Mon 64.....	\$29.99
Hes Writer 64.....	\$22.99

INFOCOM (64)	
Zork I, II, III.....	\$27.99
Deadline.....	\$29.99
Witness.....	\$29.99

PROFESSIONAL SOFTWARE (64)	
Word Pro 64 plus Spell.....	\$59.99
Trivia Fever.....	\$28.99

PROGRAM INTERNATIONAL	
Superbase 64.....	\$49.99

SPINNAKER (64)	
Snooper Troops 1 or 2.....	\$29.99
Delta Drawing.....	\$29.99

SCREENPLAY (64)	
Wylde.....	\$22.99
Kaiv.....	\$22.99
Pogo Joe.....	\$20.99

SUB LOGIC (64)	
Flight Simulator II.....	\$40.99

SYNAPSE (64)	
Zaxxon.....	\$29.99
Protector II.....	\$23.99
Blue Max.....	\$24.99

COMPUTER MAIL ORDER

west

canada

east



800-648-3311

In NV call (702)888-5654

Order Status Number: 588-5654

P.O.Box 6689, Dept. 115

Statenline, NV 89449

Ontario/Quebec 800-268-3974

Other Provinces 800-268-4559

In Toronto call (416) 828-0866

Order Status Number: 828-0866

2605 Dunwin Drive, Unit 3B, Dept. 115

Mississauga, Ontario, Canada L5L1T1

800-233-8950

In PA call (717)327-9575

Order Status Number: 327-9575

Customer Service Number: 327-1450

477 E. 3rd St., Dept. 115, Williamsport, PA 17701



No risk, no deposit on C.O.D. orders and no waiting period for certified checks or money orders. Add 3% (minimum \$5) shipping and handling on all orders. Larger shipments may require additional charges. NV and PA residents add sales tax. All items subject to availability.

FLEX FILE

DATA BASE
with Report Writer and Mail Labels

- Easy to learn (takes about 2 hours) • save up to 1500 physical records on a 1541 disk drive. • Sort on multiple keys & select records 9 ways. • Print information on labels or in report format. • Calculate report columns.
- Flexible structure: change record size, field number, ways the file can be ordered, etc. with ease. • Compatible with many popular word processors to create form letters or reports. 1541 • 4040 • 2031 Disk 159.95

1541 Physical Exam

\$39.95



- Checks electronics
- Speed disk clamping
- Radial head alignment
- Mechanical stop location
- Includes new quiet drive stop

ditto

COPY DISKS AUTOMATICALLY
\$39.95

- Copies 99% of currently available Commodore 64 disks.
- Supports 1 or 2 1541 drives.
- Takes approximately 25 minutes.
- Easy to use menu driven.
- Currently available—future updates \$17.
- ditto will even backup ditto.

PUT YOUR MESSAGES HERE IN MINUTES

Available on an annual basis



THE BANNER MACHINE™ HOLIDAY SPECIAL!
Order before 12/31/84 and receive holiday font free! Menu-driven program works like a word processor. Great for businesses, schools, or organizations. Produces large signs up to 13" tall by any length. Make borders of widths up to 1/4". Eight sizes of letters from 1/8" to 8" high. Proportional spacing, automatic centering, right and left justification. Use with Gemini 10 or 10X, Epson MX with Graftrax, or the RX or FX. Commodore 1525 or MPS 801, and the Banner Four extra fonts available (\$19.95 each). Tape or disk \$49.95.

HOME FINANCE MANAGER



Keep records of tax deductions, bank payments, monthly charges, individual item expenses, and check transactions. User friendly, menu driven. Modify or delete records with ease. Data entry in dozens of categories, more than 200 transactions per month. Review by category, date, or tax status. Print monthly reports, sort information and print tax reports. Tape or disk \$49.95.

Other programs available:

- Grade Organizer
- Chessmate 64
- Screendump
- Disk Organizer
- Menu Driven Disk Operating System
- CP/M Term
- CP/M Utilities

ORDER TOLL FREE 10-6 MON-SAT
800-762-5645

Cardinal Software

13646 Jeff Davis Hwy.
Woodbridge, VA 22191
Catalogs available. Specify:
Business/Utilities, Games,
Education, CP/M Public
Domain.
Info. Call (703) 491-6502



CROWN CUSTOM COVERS

**Protect Expensive Equipment from
Dust/Liquids with a CROWN COVER**

- ★ CUSTOM MADE TO FIT
- ★ Heavy 32-oz. VINYL ANTI-STATIC
- ★ EXTENDS EQUIPMENT LIFE
- ★ Choice of Colors Lt. Tan or Brown

COMPUTERS:

C-64/VIC20	7.00
KEYBOARD COVERS FOR ATARI;	
APPLE IIe; IBM; KAYPRO; TI99	8.00
DATASETTE (OLD)	5.00
DATASETTE (NEW, C2N)	5.00

DISK DRIVES:

C-1541	8.00
MSD S/D; APPLE S/D	8.00
MSD D/D; APPLE D/D UNIT	10.00

PRINTERS (DOT MATRIX):

C-1525; MPS801	10.00
C-1526; BMC BX80; BMC BX80F/T	13.00
GEMINI 10/10X; DELTA 10	13.00
GEMINI 15/15X; DELTA 15	16.00
EPSON MX80; RX80; RX80F/T	13.00
EPSON MX80; FX80F/T	13.00
EPSON MX100; FX100	16.00
PANASONIC KX-P1090; CARDCO	13.00

MONITORS:

C-1702 COLOR	16.00
BMC COLOR	16.00
SANYO CRT 36 (GREEN)	14.00
AMDEK COLOR I	16.00

VIDEO RECORDERS:
FOR MOST RECORDERS (CUT-OUT FOR CLOCK)13.00

Order by stating NAME and MODEL and COLOR CHOICE TAN or BROWN. Enclose check or M.O. + 1.50 Ship & Hdg. California Res. Include 6.5% Sales Tax.

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONED SKETCH. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES.

CROWN CUSTOM COVERS

9606 SHELLYFIELD ROAD
DOWNEY, CA 90240



SONAR SEARCH

... Sonar reports the "whine" of torpedoes running toward you. You kick the destroyer's rudder full-right and order flank speed.

As you watch, two torpedoes cross your bow. Sonar returns quicken and you close on the submarine below. Suddenly, bearing to target shifts 180 degrees and the sonar return is instantaneous. THE SUB IS DIRECTLY BELOW! You stab the fire button and watch as 6 depth charges arch into your wake. Several long seconds pass before they explode, sending six domes of white water to the surface. The message "SUBMARINE SUNK" flashes on the screen. But congratulations are brief. Four more subs are lurking out there somewhere, trying to escape into the open ocean...

SONAR SEARCH is a "fast-action" strategy game based on anti-submarine warfare. You are the commander of a group of three destroyers sent to intercept a pack of 5 enemy submarines. Equipped with sonar gear and depth charges, and aided by submarine sightings from other ships and aircraft, you must get directly over a sub to score a hit with your depth charges.

SONAR SEARCH makes full use of the high-resolution graphics, multicolor and audio capabilities of the Commodore 64. Programmed in machine language to provide immediate response to your commands, SONAR SEARCH is realistic, educational and entertaining. Comes complete with Instruction Manual and keyboard template.

Commodore 64™

11B CHECK ONE: Commodore™ 64 Tape or Disk (\$29.95)
Manual Only (\$5.00 if purchased separately)

Name _____

Address _____

City _____ State _____ Zip _____

USA & CANADA add \$2.50 postage & handling (\$4.00 foreign) for each game ordered. All payments must be in USA funds, all foreign payments must be against USA banks. PA residents add 6% state sales tax. Or charge to: Master Card VISA Exp. Date _____

Card No. _____ Signature _____

Unleash the Power of Your 64

64 Software Plus®

Series systems for home management
designed for the Commodore 64™



Volume I Systems

- Home Inventory • Name and Address • Home/Auto Maintenance • Event Reminder • Recording Library **\$24.95**

Volume II Systems

- Business Expense • Medical History • Electronic Bank Books • Mailing Labels • List Manager **\$24.95**

Each volume contains 5 systems. All systems include full update features, simple English on-line instructions, menu driven operation, high speed code, fast sorting and printed reports.

Introducing LOTTERY 64®



Use the computing power of your Commodore 64™ to help you play the Lottery. It's been winning for us — it can work for you too!

AVAILABLE ON DISKETTE ONLY,
90-DAY GUARANTEE

To order
send \$24.95 for each
plus \$3.00 postage and handling per order to:
Phone orders (312) 394-9594 • Add \$2 add. C.O.D. chg.

MS Superior Micro Systems, Inc.
P.O. Box 713 • Wheeling, IL 60090
Commodore 64™ is a registered trademark
of Commodore Electronics, Ltd.

FAST DELIVERY

Call Us For
Fast Service, Experience
and Affordable Prices

Software



HOLIDAY SPECIAL

SUBLOGIC
Flight Simulator
\$34.95

MICROPROSE
Solo Flight
\$24.95

F-15 EAGLE
\$29.95

INFOCOM

Zork I, II, III... '27 ea.
Suspended '27
Starcross '27
Deadline '27
Sea Stalker '27

ORIGIN

Ultima III '39

WORD PROCESSING

Paper Clip with Speller '69
Easy Script '45
Word Pro 64 & Speller '58
EZ Spell '17

PROGRAMMING SERIES

Assembler 64 '36
Logo '52

Simon Basic '34

Screen Editor '19
Nevada Fortran '39
Nevada Cobol '39

ACCOUNTING

Home Accountant '45
Tax Advantage '45
General Ledger '35
A/R, A/P, Payroll '35
The Manager '35

DATA BASES

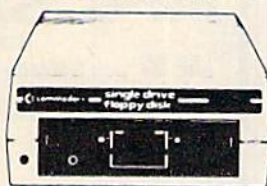
Code Writer '64
Mirage Database Mgr. '79
Super Base 64 '67

Special of the Month
The Consultant
Formerly
Delphi Oracle **\$65.00**

SPREAD SHEET

Multiplan '63
Practicalc '38

Hardware



1541 \$Call

Special of the Month
MSD DISK DRIVE
SD1 Disk Drive \$335
SD2 Disk Drive \$545

ELEPHANT DISK

SS/SD '15.50 SS/DD '16.50
Verbatim, Datalife '19.95
Maxell '19.95

HOLIDAY SPECIAL
1650 AUTO MODEM
\$87



*Call

1520 Color Plotter '109
MPS 801 Printer '205
1530 Datasette '64
1526 Printer '265
Magic Voice Speech '49.95
1011 RS 232 Interface '49

1702 Monitor
\$CALL
ZENITH MONITORS
122 Amber '84
123 Green '84

COMPUTER COVERS

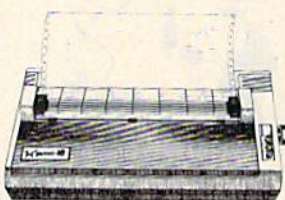


Features
heavy duty
canvas
with vinyl
interior
waterproof

Reg. \$15⁹⁵
\$6.99
CMD 64 \$6.99
VIC 20 \$6.99
Disk Drive \$6.99
Epson MX 80 \$7.99
Epson MX 80 FT \$7.99
Okidata 92 \$7.99

Printers

GEMINI 10X
\$244

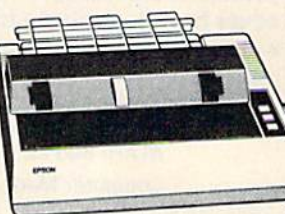


15X \$349

Number one selling dot matrix printer, Gemini 10X, prints 120 cps bi-directionally, with logic-seeking printerhead control. There's both friction and tractor paper feed. Prints high resolution graphics.

POWERTYPE.... \$325.00
RADIX 10..... \$524.95 DELTA 10 \$359.00
RADIX 15..... \$624.00 DELTA 15 \$495.00

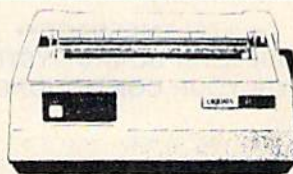
EPSON RX80
\$249



RX 80 FT..... \$279

The most compatible dot matrix printer, prints 100 cps, bi-directionally. Call for RX-100, FX-80 and FX-100 prices.

OKIDATA 92
\$399



The most advanced dot matrix printer, prints 100cps, bi-directionally. Correspondence quality at 40 cps.

OKIDATA 93 \$649.00 OKIDATA 84 \$759.00

PRINTER INTERFACES

Micrografix MW350 '74
Tymac Connection '79
Cardco + G Interface '66
Cardco B Interface '39
Grappler CD '102

SURGE PROTECTORS

1 Outlet '14
4 Outlet '38
6 Outlet '69
6 Outlet &
Noise Filter '88



Ordering & Payment Policy

Prices reflect a cash discount. For C.O.D., Visa, and MasterCard add 3% Immediate delivery with certified check or wired funds. N.J. resident add 6%. Prices subject to change.

Shipping

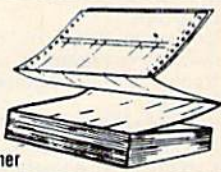
For shipping and handling add 3%. (\$3 minimum)
Larger shipments require additional charge.

Special Offer With Printer Purchase!

STARTER PAK

For Gemini or Okidata
300 Sheets & Ribbon

\$9.95



FOR EPSON..... \$10.95

Limit One Per Customer

FOR INFORMATION CALL (609) 596-1944

ORDER TOLL FREE (800) 992-3300

PC GALLERY

P.O. Box 3354
Cherry Hill, N.J. 08034

BridgePro®



- One and two player games
- Random hands — millions possible
- HELP features for beginners
- "Duplicate" Bridge option
- DEMONSTRATION and BEST HAND modes
- QUIT, AUTO FINISH, and REPLAY options

Ever wonder why millions around the world enjoy the card game of Bridge? Why so many play year after year? Bridge is that kind of game: uniquely challenging and exciting. BridgePro™ makes it easy and fun to learn or improve Bridge skills. If you already know how to play, BridgePro™ lets you enjoy Bridge by yourself. And the cards are randomly dealt — you'll never have to repeat a hand. For many, BridgePro™ will be a game that never grows old.

Diskette \$35 (COD's add \$2).

Visa/MC accepted. California residents add 6.5% tax.

Commodore 64 • APPLE II+, IIc, or IIe
ATARI 800 XL, 1200 XL, or min. 40K

Computer Management Corporation

2424 Exbourne Court, Walnut Creek, CA 94596 • (415) 930-8075

Dealer/Distributor inquiries welcome

DON'T

SPEND ANOTHER DIME ON ANY OTHER GAME UNTIL YOU EXPERIENCE

-the Challenge- -the Suspense- -the Power of- **SALVAGE**

Graphic Adventure Game Series

Salvage I

Explore the sunken S.S. Commodore. Can you defy the curse and recover the valuable treasures below?



Salvage II

Unlock the secrets of an evil Alien Race from Outer Space and return with just two items—a valuable gem... and your life!



Salvage III

Conquer the Ultimate Adventure Challenge! Expose the traitorous spy who sabotaged the ship and murdered its crew for millions in GOLD! Computer Generated Graphics in every program shows your salvage boat, the sunken ship, diver location and more.



-for Commodore 64 and Vic \$27.95 DISK \$24.95
CASSETTE Order all three for only \$65.00 and we will send you our \$27.95 Action Arcade BATTLESHIP game absolutely FREE! - send check or money order to



Dynastar Productions

P.O. Box 508, Toano, VA. 23168

804/564-0087

Dealer Inquiries Invited

• •TELEMESSAGE• • BULLETIN BOARD SYSTEM FOR YOUR COMMODORE 64

Now you can operate your own Private Message System. Our package is more than just a Bulletin Board program. We designed a message system with flexibility, ease of operation and security features found on the large information services. TELEMESSAGE is a versatile system that can also be used for many business applications. Advertising and on-line order processing are excellent methods for promoting software sales! The system package includes 5 support programs in addition to the real time processor. With these tools and the comprehensive operations manual, you will have your system operating right away!

FEATURES:

- * Completely automatic operation
- * Security to prevent abuse or tampering
- * Supports 100 registered users with passwords
- * Storage capacity for 100 private messages
- * Includes 5 support programs (38 functions)
- * Comprehensive operations manual

REQUIRES: two 1541 drives, one auto answer modem

We are introducing the TELEMESSAGE system for only \$79.50 including shipping. Please send your order with a check or money order to:

TAILORED SOLUTIONS
P.O. Box 183
Washington, D.C. 20044

IMPROVED! More comprehensive!

OnTrack^{AD}

1540/1541

Disk Drive

Alignment System

System Includes:

PRECISION TRACK INDICATOR (PTI)

- EASILY INSTALLED OR REMOVED
- SHOWS EXACT TRACK BEING USED AT ALL TIMES
- ACTS AS AN INVALUABLE BACKUP COPY TOOL
- REDUCES BACKUP COPY TIME UP TO 90%
(WHY WRITE UNNEEDED BAD BLOCKS)
- WORKS WITH ALL COPY SOFTWARE

ALIGNMENT/UTILITY DISKETTE

- GIVES TUTORIAL ON USE OF PTI
- PREVENTION TIPS ON ALIGNMENT PROBLEMS
- STOP HEADBANGING — EXTEND DRIVE LIFE
- ON TRACK INDICATOR PROGRAMS
- VIC 20 AND COMMODORE 64 COMPUTERS

PHOTO-ILLUSTRATED INSTRUCTIONS

- PRECISION TRACK INDICATOR INSTALLATION
- DISK SPEED AND HEAD ADJUSTMENTS

REQUIRES NO MODIFICATION
TO YOUR DISK DRIVE!

ALL OF THE ABOVE \$15.98

POSTPAID U.S.A.
(MARYLAND RESIDENTS ADD 5% TAX)
(FOREIGN ORDERS ADD \$2.00 U.S.)

Send Check or Money Order to:

SchuLace ENTERPRISES
P.O. BOX 771
CASCADE, MD. 21719

FAST RESPONSE !!!

All Orders shipped First Class

Thieves lurk everywhere

Precious seconds tick away as you maneuver through an intricate maze to the vault. Grab the money and hurry back to the armored truck... but don't get frantic. One mistake means an ambulance escort to defeat.



BRINX JINX

Not recommended for sissys!

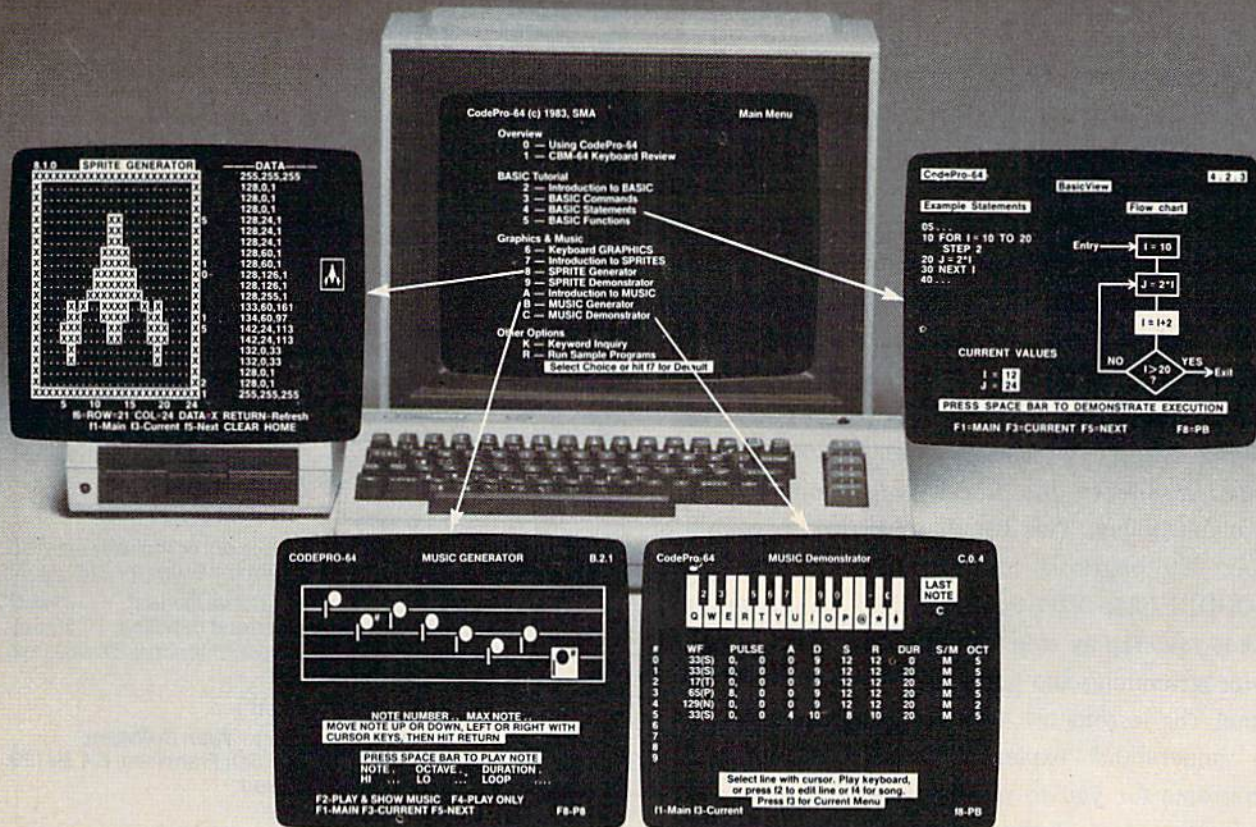
Brinx Jinx has up to 36 mazes and 7 vault locations to challenge your skills, along with 4 levels of difficulty to test your expertise.

Brinx Jinx features high resolution multicolor graphics, sprites, sound effects, and is 100% machine language.

Brinx Jinx is available for the C:64 on disk only and a joystick is required.

Send \$29.95 (California residents add \$1.95 sales tax) in check or money order to: Chromazone Software, P.O. Box 7325, San Jose, CA 95150-7325

Allow 4-6 weeks for delivery.



Simply Incredible. Incredibly Simple.

CodePro-64 For Your Commodore.

Instructional Software That Will Amaze You With What You Learn.

CodePro-64 is the easy way to learn.

CodePro-64 astonishes you with how much you can learn. And how easy learning can be. With CodePro-64, you'll learn to write your own programs. You'll develop advanced programming skills with graphics, sprites and music. And best of all, you'll learn visually.

CodePro-64 is a complete package.

First and foremost, it's a comprehensive BASIC language tutorial. With it, you learn by seeing as well as by doing. You watch variables change value. You see statement

branching occur. You can even see "For-Next" statements executed.

There's graphics instruction, too.

CodePro-64 also has a SPRITE Demonstrator and Generator. With it, you'll master the concepts and techniques of graphics programming with sprites. And you'll be able to create and save your own sprites for use in your programs.

And we don't forget the music.

You'll use the MUSIC Demonstrator and Generator to learn how to get the musical effect you want. Exactly. And in seconds.

You'll use it to compose simple tunes on the screen and then save the tune to a diskette file.

Discover how good CodePro-64 is.

We ship CodePro-64 as a package of 16 integrated programs, distributed on two diskettes, and containing sample programs for unlimited use. It is supported by a 140-page manual and is packaged in an attractive three-ring binder.

CodePro-64. Incredible. And simple. And only \$59.95.

How To Order...CodePro-64—\$59.95

(Requires Commodore 64 with disk drive)

CP-640 CodePro-64 _____ × \$59.95 = _____
 Shipping (US & Canada orders): + \$ 3.00
 Shipping (Foreign orders add): + \$15.00
 N.C. Orders add 4½% Sales Tax: + _____
CodePro-64 Total: _____

For quicker response on credit card orders, call...

Toll Free 1-800-762-7874 (In North Carolina 919-787-7703)

Our Guarantee

Try your copy of CodePro-64 for 10 days. If you are not completely satisfied, return it to us undamaged and we'll refund your money. No questions asked. Dealer inquiries invited.



SYSTEMS MANAGEMENT ASSOCIATES
 3700 Computer Drive, Dept. CPG
 Raleigh, North Carolina 27609

Mail to...

Name _____ PLEASE PRINT
 Address (No P.O. Boxes, please) _____
 City, State, Zip _____
 Method of Payment—No CODs, please
 Check or Money Order (US Funds Only) VISA MasterCard
 Card Number _____ Expiration Date _____
 Signature _____

A Printer For All Reasons

Search For The Best High Quality Graphic Printer

If you have been looking very long, you have probably discovered that there are just too many claims and counter claims in the printer market today. There are printers that have some of the features you want, but do not have others. Some features you probably don't care about, others are vitally important to you. We understand. In fact, not long ago, we were in the same position. Deluged by claims and counter claims. Overburdened by rows and rows of specifications, we decided to separate all the facts — prove or disprove all the claims to our own satisfaction. So we bought printers. We bought samples of all major brands and tested them.

Our Objective Was Simple

We wanted to find that printer which had all the features you could want and yet be sold directly to you at the lowest price. We wanted to give our customers the best printer on the market today at a bargain price.

The Results Are In

The search is over. We have reduced the field to a single printer that meets all our goals (and more). The printer is the GP-550CD from Seikosha, a division of Seiko (manufacturers of everything from wrist watches to space hardware). We ran this printer through our battery of tests and it came out shining. This printer can do it all. Standard draft printing up to a respectable (and honest) 86 characters per second, and with a very readable 9 (horizontal) by 8 (vertical) character matrix.

"NLQ" Mode

One of our highest concerns was about print quality and readability. The GP-550CD has a print mode termed Near Letter Quality printing (NLQ mode). This is where the GP-550CD outshines all the competition. Hands down! The character matrix in NLQ mode is a very dense

9 (horizontal) by 16 (vertical). This equates to 14,400 addressable dots per square inch. Now we're talking **quality** printing. You can even do graphics in the high resolution mode. The results are the best we've ever seen.

Features That Won't Quit

With the GP-550CD your computer can now print 40, 48, 68, 80, 96, or 136 characters per line. You can print in ANY of 18 font styles. You not only have the standard Pica, Elite, Condensed and Italics, but also true Superscripts and Subscripts.

Do you sometimes want to emphasize a word? It's easy, just use **bold** (double strike) to make the words stand out. Or, if you wish to be even more emphatic, underline the words. Or do both. You may also wish to "headline" a title. Each basic font has a corresponding elongated (double-wide) version. You can combine any of these modes to make the variation almost endless. Do you want to express something that you can't do with words? Use graphics with your text — even on the same line.

You can now do virtually any line spacing you want. You may select 6, 8, 7½ or 12 lines per inch. PLUS you have variable line spacing of 1.2 lines per inch to infinity (no space at all) and 97 other software selectable settings in between. You control line spacing on a dot-by-dot basis. If you've ever had a letter or other document that was just a few lines too long to fit a page, you can see how handy this feature is. Simply reduce the line spacing slightly and... VOILA! The letter now fits on one page.

Forms? Yes! Your Letterhead? Of Course!

Do you print forms? No problem. This unit will do them all. Any form up to 10 inches wide. The tractors are adjustable from 4½ to 10 inches.

Yes, you can also use single sheets. Plain typing paper, your letterhead, short memo forms, anything you choose. Any size under 10" in width. Multiple copies? **Absolutely!** Put forms or individual sheets with carbons (up to 3 deep), and the last copy will be as readable as the first. Spread sheets with many columns? **Of course!** Just go to condensed mode printing and print a full 136 columns wide. Forget expensive wide-carriage printers and changing to wide carriage paper. You can now do it all on a standard 8½" page.

The Best Part

When shopping for a quality printer with all these features, you could expect to pay around \$500 or more. *Not any more!* Everything is included. We are now able to sell this fantastic printer for **only \$259.95!** The GP-550CD is built especially for the Commodore 64 and the VIC-20. All Commodore graphics are included. This printer does everything the Commodore printers do but has more features. **You need absolutely nothing else to start printing — just add paper.** We give you a 15-day satisfaction guarantee and a 1-year warranty is included with your printer.

The Bottom Dollar

The GP-550CD is only \$259.95. Shipping and insurance is \$8.00 — UPS within the continental USA. If you are in a hurry, UPS Blue (second day air) is \$18.00. Canada, Alaska, Mexico are \$25.00 (air). Other foreign is \$60.00 (air). California residents add 6% tax. These are cash prices — VISA and MC add 3% to total. We ship the next business day on money orders, cashiers' checks, and charge cards. A 14-day clearing period is required for checks.

TO ORDER CALL TOLL FREE

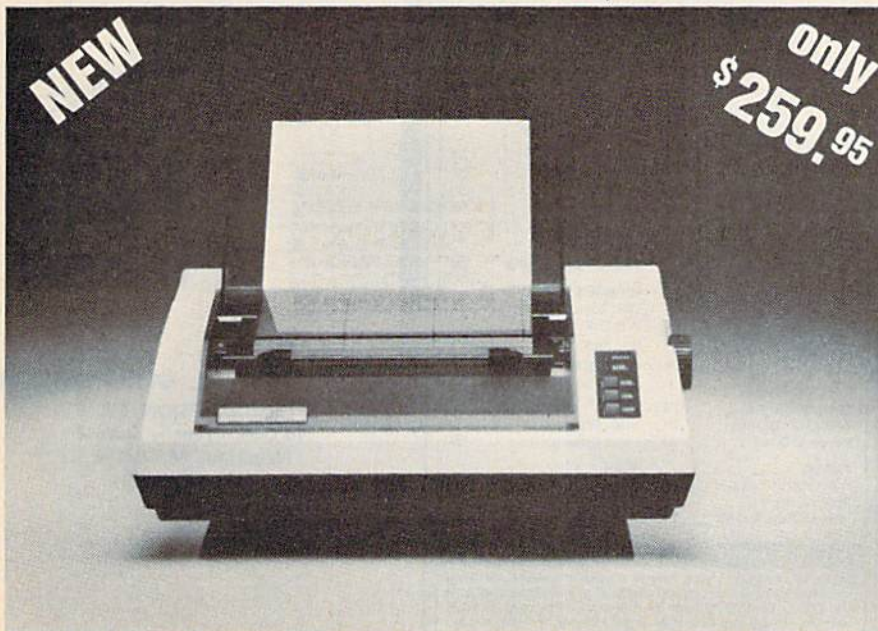
1-(800) 962-5800 USA
or 1-(800) 962-3800 CALIF.

or send payment to:

APROPOS TECHNOLOGY

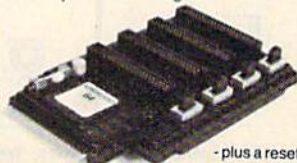
1071-A Avenida Acaso
Camarillo, CA 93010

Technical Info: 1-(805) 482-3604



New Product! APROSPAND-64 for C-64

Gives your Commodore-64 full expandability! Four independently switchable cartridge slots are compatible with ANY Cartridge for the '64.



- plus a reset button!

ONLY \$39.95

ADD: \$3.00 Shipping (Cont. U.S.), \$6.00 CAN, HI, AK.

**WHATEVER'S
ON THE
SCREEN
"SNAPSHOT"
CAN SAVE IT!**



NOW anything that can be drawn on your screen by any program, or right from the keyboard, can now be transferred to your printer by a simple key press using SNAPSHOT. SNAPSHOT is a program which will "Take a picture" of whatever is printed including standard or custom characters... multi-color mode, Hi-Res graphics, Sprites and more. REMEMBER SNAPSHOT'S only function is TO DUMP the screen precisely as it appears, into the printer.

The SNAPSHOT Program is compatible with the Epson and Gemini Star printer. To order, send \$19.95 check or money order to the address below. Free information pamphlet available upon request.

**COMPUTER
REVELATIONS, INC.**
76 E. RIDGEWOOD AVENUE
RIDGEWOOD, NJ 07450

**FOR COMMODORE 64™
DISKMIMIC 5+™**

- Copy Disks Automatically
- Backs up virtually all existing disks for Commodore 64™ including Copy Protected Versions. ALL AUTOMATICALLY
- Supports 1541™ Drives.
- Don't be without back-up!
- Formats disk in less than 20 seconds.

Now 3 Times as Fast!

**BACKS UP ENTIRE
COPY PROTECTED DISKS
IN LESS THAN 8 MINUTES!!**

ONLY \$49.95

A.I.D. CORP.
4020 HEMPSTEAD TURNPIKE
BETHPAGE, NEW YORK 11714
(516) 731-7100

Diskmimic 5™ is a trademark of
A.I.D. Corporation
Commodore 64™ & 1541™ is a
trademark of
Commodore Electronics Ltd.

Shipping & Handling — \$1.50 each

PEEK A BYTE™ 64

A DISK AND MEMORY EDITOR
Peek A Byte is more than a disk editor—it features a C-64 memory display in HEX, ASCII, or screen code and a full page editor with cursor control.

YOU CAN PEEK A BYTE...
Change file or disk names, recover "lost" programs, compare disk data, display free sector map, convert HEX/decimal, read disk drive memory, disassemble disk or memory data, print most screen displays... and much more!

IT'S EASY TO USE!
All commands are simple, easy to remember keystrokes and HELP screens are always available. Complete error handling for key entries and disk read/write errors. Tutorial manual for beginners and pros!

PEEK A BYTE IS FAST ML CODE
Above BASIC and compatible with many BASIC programs, ML routines, and the DOS Wedge 5.1. Doesn't "lock up" the computer and you can backup the diskette.

QUANTUM SOFTWARE
P.O. BOX 12716, Dept. 4
LAKE PARK, FL 33403

**ALL FOR
\$29.95**
US Post Paid

PEEK A BYTE is a trademark of Quantum Software

To order send check or money order, US funds. Foreign and noncontinental US orders add \$3 for shipping and handling. Florida residents add 5% sales tax. For US COD orders add \$2. Phone orders call (305) 840-0249.

FREE! CONVERSION TABLES
for converting between HEX, decimal, high decimal, binary, characters, and BASIC tokens. Send a self addressed, \$2.20 stamped business envelope for info.

Tired...?

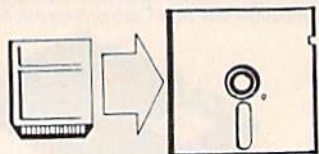
...of having to swap cartridges in and out whenever you wish to play a new game? Want to store up to 17 cartridges on a single diskette? If the answer is YES, then CBUS is for you.

- CBUS I - Make backup copies of C64 cartridges to disk. Includes circuit board and manual with software listings. **\$ 34.95**
- CBUS I Deluxe - as above, with all necessary programs on disk **\$ 49.95**
- CBUS II - 16 Kbyte RAM Cartridge Emulator with write protection. Allows you to run copy-protected cartridges from disk, or develop your own cartridge software. Includes circuit board and manual with software listings **\$ 84.95**
- CBUS II Deluxe - as above, with all necessary programs on disk **\$ 99.95**
- CBUS Combo - Includes CBUS I and CBUS II with diskette **\$119.95**

Please add \$3.00 for shipping; VISA, MasterCard, check, money order

CBUS™

CARTRIDGE BACKUP SYSTEM



R.J. Brachman Associates, Inc.
P.O. Box 1077, Havertown, PA 19083
(215) 622-5495

Commodore 64 is a registered trademark of Commodore Electronics, Ltd.

AA COMPUTER EXCHANGE
"SOUTH'S LARGEST COMMODORE 64 DEALER"
OVER 2000 ITEMS IN STOCK

COMPLETE REPAIR SERVICE FOR
COMMODORE 64 AND C-64 PERIPHERALS

ORDER LINE: 1-800-447-0088
INQUIRIES & FL: 904-388-0018

REQUEST OUR FULL CATALOG TODAY

HERE ARE A FEW OF OUR MAIL ORDER PRICES

HARDWARE & ACC.	PRECISION SOFTWARE
C-64 Computer 199	Superbase 60
1541 Disk Drive 239	BATTERIES INC.
1702 Color Monitor 239	Paper Clip w/Spellpack 82
MSD Single Drive 338	The Consultant 68
MSD Dual Drive 551	Home Organizer Ser. (ea) 20
HES Modem I 49	PRACTICORP
HES Auto Modem II 89	64-Doctor 20
Westridge Auto Modem 76	Practicalc 64 37
C-64 Power Supply 29	Practifile 37
RS-232 Interface 30	PS: Spreadsheet 54
Par. Printer Intfc 30	PROFESSIONAL SOFTWARE
ACCESS SOFTWARE	Wordpro 3+ w/Speller 54
Beach Head 24	MIRAGE CONCEPTS
Raid Over Moscow 24	Data Base Manager 61
Master Composer 28	W.P. Prof. Version 61
COMPUSERVE	W.P. Pers. Version 28
Starter Kit (5 hr) 23	SKYLES ELECTRIC
Executive Kit (2 hr) 52	"1541 Flash" Disk Drive
Vidtex 28	Speed-Up Kit 69
EPYX SOFTWARE	SUBLOGIC
Summer Games 24	Flight Simulator II 37
World's Grt Baseball 24	MISC.
Robots of Dawn 24	Doodle 28
KOALA	Smart 64 Term 29
Koala Pad 58	Telstar 64 Term (Cart) 34
Spider Eater 18	
Programmers Tool Kit 24	

2726 PARK ST., JACKSONVILLE, FL 32205

Orders with cashiers check, money order and VISA/MC shipped promptly. * For personal/company checks allow 3 weeks for clearance. * No CODs. * For VISA/MC add 3%. * Shipping charges extra. \$3.00 minimum. * Prices may differ in AA stores. * Florida residents add 5% tax. * Prices subject to change without notice.

COMPUTEREYES™

VIDEO IMAGES ON YOUR COMMODORE!

Finally - an inexpensive way to capture real-world images on your Commodore's Hi-Res display! COMPUTEREYES™ is an innovative slow-scan device that connects between any standard video source (video tape recorder, video camera, videodisk, etc.) and the Commodore's User I/O Port. Under simple software control, a live image is acquired in less than five seconds. A unique multi-screen mode also provides realistic, grey-scale images. Hundreds of applications!



Package includes interface module, complete easy-to-use software support on disk or tape (specify), owner's manual, and one year warranty. COMPUTEREYES™ is available from your dealer or direct from DIGITAL VISION for just \$129.95 plus \$4.00 S&H (US).

Also available as a complete package including:
• COMPUTEREYES™
• Quality hiw video camera
• Connecting cable
for only \$149.95 plus \$9.00 S&H

Demo disk available for only \$10.00 postpaid.



Mass. residents add 5% sales tax. MasterCard, Visa accepted. To order, or for more information, write or call.

Screen dumps of actual COMPUTEREYES™ images

Also available for Apple II series.

DIGITAL VISION
DIGITAL VISION, INC.
14 Oak Street — Suite 2
Needham, MA 02192
(617) 444-9040

UNIQUE HARDWARE

For Your Commodore or Vic

Commodore or Vic Color Problems? We Can Solve Them All.

You're not alone. Thousands of Commodore 64 owners have "fuzzy" color on their TVs. Most have interference lines crowding out their great graphics. Many have bought expensive monitors or new TVs, and often even that hasn't helped. But, most of us just lived with the problem. Now the engineers at Bytes & Pieces have four simple, inexpensive solutions.

If you have an "old 64" (with the 5 pin Monitor Din Plug), you've probably had color, resolution and interference problems. We can solve them!

- 1. The Interference Stopper...** For Vic-20 and Commodore 64 A new kit that installs in minutes with two simple solder connections. Best results when combined with #2, 3, or 4 below. Absolutely stops 90% of the RF interference on your screen. **\$15.95**
- 2. The Color Sharpener...** Use if your "old 64" is hooked up to a TV. Just plug into the monitor plug, and the color and contrast immediately improve. Dramatically. Crisp letters. Great graphics. **\$18.95**
- 3. The NEW Color Sharpener CABLE...** Use if your "old 64" is hooked up to a monitor. A new 2 prong cable, with the Color Sharpener built in. All the benefits of #2, on your monitor. **\$24.95**
- 4. The Monitor "Improver"...** If you have a Commodore 1701 monitor, this cable (3 prong) gives you a picture you won't believe. Better than the cable Commodore built in by a lot. Try it, you won't be disappointed. (Also hooks your "Old 64" to the 1702) **\$24.95**

- 5. At last, the "needed" switch for all Vic-20's and Commodore 64's.** Commodore left out something that's really important — a simple reset switch. How many times have you been programming and gotten "hung-up" in your software? The only way to get back in control is to turn off the computer and lose your program and everything you had entered so far. Well, the engineers at Bytes & Pieces have solved that one too — a reset switch. Now installing this does require you to open your computer, make two simple solder connections, and drill a small hole in the case (to mount the switch). Obviously, this connection will void your warranty, so don't proceed until your computer is out of warranty. But the day that happens, install the reset switch. It's a time saver, and it's guaranteed to return control to you every time. Of course, you're guaranteed to be satisfied.

A steal at **\$9.95**

- 6. Dust problems? We've got the answer!** There are a lot of cheap dust covers on the market, most of them made from static-filled plastic. But there are some of us who think a lot of our Commodores. We want to protect them and have them look nice at the same time! That's why Bytes & Pieces built the best looking dust covers on the market. They're hand-sewn from leather-like naugahyde in a brown leather-grain pattern. They're custom-built to fit your Commodore 64, and here's the best news of all. You can get matching covers for your disk drives and your cassette unit as well. You made a big investment in your Commodore, spend a few more dollars and protect it from damaging dust for life. Your satisfaction is guaranteed.

Computer dust covers: **\$9.95**

Disk drive dust covers: **\$8.95**

Dataset dust covers: **\$7.95**

Why Blank "Cheat" Sheets?



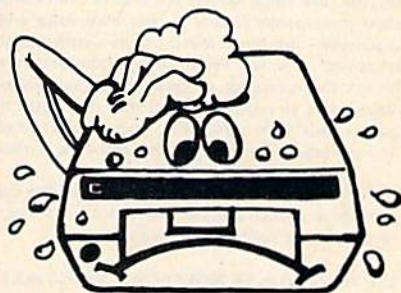
Because They're Better Blank

OK. So now you've got the best computer in the world, and lots of complex software to run on it. One problem. Unless you work with some of these programs everyday or are a computer genius, who can keep all those commands straight? "F5" in one program means one thing, and "F5" in another program means something else.

A few companies do offer a solution... a die cut "cheat" sheet that attaches to your keyboard with all the commands of one program printed on it. Great idea, unless you need them for 10 or 20 programs. You could purchase another disk drive for the same investment. Our solution? Simple. A pack of 12 lined cards, die cut to fit your keyboard and just waiting to be filled with those problem commands you forget most often. Simple? Yes, but effective. Now you can have **all** your program commands right at your finger tips on YOUR VERY OWN, custom designed "cheat" sheets. Order a couple packs today!

12 for **\$15.95**

Is Your Commodore Disk Drive Hot and Bothered?



Most of them are, you know. Commodore makes a great disk drive. Only trouble is, they suffer from read and write problems frequently. And almost always, it means a trip to the shop for a head alignment. Maybe you can afford to have your drive out of commission for a while. And to pay to have your drive repaired. But we've been told that most of these problems occur because the drive has overheated, throwing the head out of alignment because of parts expansion.

The engineers of Bytes & Pieces pondered this problem, and came up with a simple solution. An inexpensive muffin fan that sits on top of the disk drive and blows cooling air through it. No more hot and bothered drives. No more heat-caused read/write problems. A simple, inexpensive solution. And best of all, the fan will work on other computer items as well, as long as they have vent holes in the top. Just set the padded fan on top and your problems with overheating are over.

And we went one step further. We built a surge protector into a second fan model. Most double-outlet surge protectors sell for more than the cost of our fan and surge protectors put together.

So order today. You won't be sorry. Satisfaction guaranteed or your money back.

Muffin fan **\$54.95**

Fan with surge protector **\$79.95**

Order Today!

Rush me the following:

Qty.	Item	Amount	Qty.	Item	Amount
_____	Commodore 64 Interference Stopper @ \$15.95	\$ _____	_____	Muffin Fans	\$ _____
_____	Vic-20 Interference Stopper @ \$15.95	\$ _____	_____	Muffin Fans @ \$54.95	\$ _____
_____	Color Sharpener @ \$18.95	\$ _____	_____	Muffin Fans with Surge Protector @ \$79.95	\$ _____
_____	NEW Color Sharpener Cable @ \$24.95	\$ _____	_____	Shipping & Handling	\$ 2.00
_____	The Monitor Improver *\$24.95	\$ _____	_____	Sub Total	\$ _____
_____	The Reset Switch @ \$9.95	\$ _____	_____	5% State Tax (Wisconsin Residents only)	\$ _____
_____	Dust Covers		_____	TOTAL	\$ _____
_____	Commodore Dust Cover @ \$9.95	\$ _____			
_____	Vic-20 Dust Cover @ \$9.95	\$ _____			
_____	1541 Disk Dust Cover @ \$8.95	\$ _____			
_____	Dataset Dust Cover @ \$7.95	\$ _____			
_____	Cheat Sheets				
_____	Sets of 12 Keyboard Cheat Sheets @ \$15.95	\$ _____			
_____	2 Packs (24 Sheets) @ \$24.95	\$ _____			

Bytes & Pieces, Inc.

550 N. 68th Street,
Wauwatosa, WI 53213

(414) 257-1214

Dealer Inquiries Invited

Check or Money Order enclosed
 Charge to my VISA or MasterCard

VISA # _____

MasterCard # _____

Inner Bank # _____

Expiration Date _____

Signature _____

SHIP TO:

Name _____

Address _____

City _____

State / Zip _____

THE ULTIMATE SPEECH DIGITIZER



Only
\$89.95

Complete with headset, microphone, speech synthesis and music software.

Hailed at CES as one of the most innovative consumer electronic products of 1984, the Voice Master for 1985 is even better! It is a speech synthesizer that speaks clearly in your own voice and language. Now it even measures voice pitch. Music can be written, produced, and taught just by humming a tune! Word recognition software (available separately) allows the computer to respond to your voiced commands. The Voice Master has so much potential that it boggles the mind! Applications in games, business, education, and research. Excellent customer support and generous license rights for software authors.

Available for many personal computers. The Commodore 64 version will reproduce speech without any extra hardware. Voice Master will make your personal computer, personal.

SEE YOUR DEALER NOW FOR A VOICE MASTER DEMONSTRATION

Or call us at (503) 342-1271 for a telephone demonstration. Please include \$4.00 shipping/handling when ordering from the factory. Visa, MC, MO, or check. Specify disk or tape. Call or write for further information and receive a FREE audio demo tape!



COVOX INC.

675-D Conger St., Eugene, OR 97402
Telex 706017

IT'S HERE!

DiskMaker™

**COMPLETELY AUTOMATIC
DISK BACKUP-COPY SYSTEM**

24 hr. Order Line

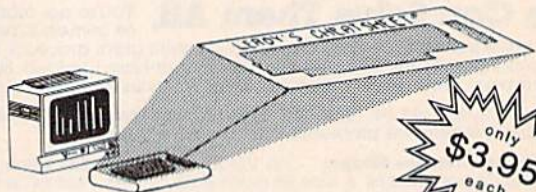
805-687-1541 Ext. 54

Technical Line 805-682-4000 Ext. 33

basix

3463 State Street • Suite 1541D • Santa Barbara • CA 93105

LEROY'S CHEATSHEET® KEYBOARD OVERLAYS



only
\$3.95
each

FOR COMMODORE 64

(VIC-20 also available)

LEROY'S CHEATSHEETS® are plastic laminated keyboard overlays designed for use with popular software and hardware for Commodore's VIC-20 & C-64 computers.

These cut-it-out yourself overlays are designed to fit over the keyboard surrounding the keys with commands and controls grouped together for easy references.

LEROY'S CHEATSHEETS®

make life easier for you

WORD PROCESSORS

- EASY SCRIPT¹
- HES WRITER
- PAPER CLIP
- QUICK BROWN FOX
- SCRIPT 64
- * SPEEDSCRIPT (GAZETTE)
- WORDPRO 3/PLUS

PRINTERS

- COMMODORE 1525, MPS-801
- COMMODORE 1526¹
- EPSON RX-80
- * GEMINI 10X

TERMINALS

- TERM 64
- * THE SMART 64 Terminal
- * VIDTEX

LANGUAGES & UTILITIES

- BASIC
- HESMON 64
- LOGO (CBM-sheet 1)¹
- LOGO (CBM-sheet 2)¹
- PILOT (CBM)¹

* NEW

DATA BASES

- THE CONSULTANT (Delphi's Oracle)
- MANAGER¹
- SUPER BASE 64

SPREADSHEETS

- CALC RESULT (ADVANCED)
- CALC RESULT (EASY)
- EASY CALC¹
- MULTIPLAN (HES/MICROSOFT)
- PRACTICALC 64/PLUS

MISCELLANEOUS

- BLANKS (3 ea-NOT laminated)
- * FOR THE BEGINNER
- SPRITES ONLY
- * FLIGHT SIMULATOR II

GAZ 12

Qty. X \$3.95 \$

Shipping & handling \$ 1.00

6% sales tax \$
(PA residents only)

TOTAL \$

Dealer inquiries welcome

Name

Address

City State Zip

(1) Products of Commodore Business Machines.

CHEATSHEET PRODUCTS™

P.O. Box 8299 Pittsburgh PA. 15218 (412)731-9806

VISA

master charge

... or see your local dealer!

TUSSEY MT. SOFTWARE and Peripherals

Don't pay for expensive ads. The lowest prices are here. "Find a lower price and we'll beat it!"

Toll Free Order Line: **800-468-9044**
Information and PA orders: 814-234-2236
Phone lines open 10-8 Mon-Fri, 10-5 Sat

—Order with confidence. We honor manufacturer's warranties
—UPS second day air available, \$3.00 extra on software

—We ship COD on everything except printers, monitors, and disk drives
—Next day shipping on in-stock items

—We accept Mastercard and Visa
—Free 20 page catalog available

PRINTERS

Gemini 10X	\$249.00
Gemini 15X	\$377.00
Delta 10, 160 cps, 8k buffer	\$389.00
Delta 15	\$580.00
Powertype, 18 cps, letter quality	\$349.00
Radix 10, Radix 15 printers from Star Micronics	Call
All above printers come with a 180-day warranty, which we honour with immediate replacement upon receipt of failed unit.	
Cardco LQ1 letter quality printer	\$459.00
Cardco LQ2	\$299.00
Cardco LQ3	Call
Grappier CD printer interface	Call
Panasonic KXP 1090	\$239.00
Panasonic KXP 1091	\$299.00
Xetec GPI	\$76.99
Xetec SPI/B	\$59.99
Xetec SPI	\$43.99

DATABASES

The Consultant (formerly Delphi's Dactile)(d)	\$63.99
Mirage Database Manager(d)	\$62.00
Superbase 64(d)	\$64.99
Data Manager II(d) by Timeworks	\$37.00
Practfile by MSId	\$37.00

SPREADSHEETS

Calc Result Adv (d, cart)	\$67.00
Calc Result Easy(cart)	\$33.99
Hesware Multiplan(d)	\$65.00
P.S. (Prog. Spreadsheet)(d)	\$49.99
Practicalc 64(d)	\$36.00
Practicalc 64(t)	\$34.00

MONITORS

Zenith 12" Amber	\$97.00
Zenith 12" Green	\$92.00
Sakata SC100 Color Monitor w/stand	\$239.00
Amdek Color 1 Plus	\$259.00
Cable for monitors	\$9.95

MONTHLY SPECIALS

Expires 12/31/84

Specials change every month

Gemini 10X	\$249.00
Delta 10, 160 CPS, 8K Buffer	\$389.00
WP64, Spellpro 64, Power 64, or Pal 64 by Proline	\$39.99 each
Toolbox 64 by Proline	\$69.99
1541 Express	\$73.99
P.S., the programmable spreadsheet	\$49.99

HARDWARE

MSD SD1, single disk drive	\$334.00
MSD, SD2, double disk drive	Call
BI 80, batteries included 80 column card with Basic 4.0 built in	\$137.99
Bus Card II by Batteries Included	Call

CARDCO

Printer int. w/graphics	\$67.00
Printer interface/B	\$44.00
Light pen	\$29.00
Numeric keypad	\$35.00
5 slot exp. interface CB/5	\$58.00
Mail Now/64	\$32.00
Spell Now	Call
File Now	Call
Graph Now	Call

UTILITIES

The Last One(d), a Basic program generator	\$64.00
Pal 64 assembler by Proline(d)	\$39.99
Power 64 Basic by Proline(d)	\$39.99
Toolbox 64, both Pal 64 and Power 64(d)	\$69.99
Supercopy 64 by Blue Sky(d)	\$29.99
SuperBasic 64 by Blue Sky(d)	\$29.99
Add on Basic by Blue Sky(d)	\$29.99
Canada A/M backup program	\$39.95
Simon's Basic	\$39.95

WORD PROCESSORS

WP64 by Proline(d)	\$39.99
Wordpro 3+/64 w/Spellright(d)	\$59.00
Paperclip(d)	\$59.00
Paperclip w/spellpack(d)	\$76.99
Cardco Write Now/64 (cart)	\$37.00
Mirage Professional W.P.(d)	\$59.00
Mirage Personal W.P.(d)	\$29.00
Omni Writer/Speller(d)	\$45.00
Word Writer(d) by Timeworks	\$37.00

MODEMS

Commodore 1600	\$56.00
Commodore 1650 autotanswer, autodial	\$84.00
Hesmodem II	\$49.00
Hesmodem II	\$99.00
Compuserve starter kit	\$26.95
Westridge modem	\$76.95
Mighty Mo, new modem from USI	\$89.95
VP terminal package by Softlaw	\$39.95
Vidrex terminal pack and Compuserve starter kit	\$59.99

MISCELLANEOUS

Kaigpad w/painter(d)	\$65.00
Spellpro 64(d) by Proline	\$39.99
Mailpro 64	\$39.99
Complete Personal Accountant(d)	\$54.00
Verbatim Datatype ss/dd disks (10)	\$23.99
Maxell MD 1 ss/dd disks (10)	\$21.99
1541 Express by RTC	\$73.99
Smart Cable	Call
Musicalc 1	\$37.95
Musicalc 2	\$27.95
Musicalc 3	\$27.95
SAM, Software Automatic Mouth	\$47.95
Mirage Advanced Report Generator	\$39.95
The Home Accountant	\$46.95
Timeworks Inventory, A/P/A/R, Cash Flow Management, General Ledger, Payroll Management	\$40.95 each
64 Doctor	\$24.95
FCM, First Class Mail	\$36.95
Super Sketch	\$39.99
Simon's Basic	\$39.95

BUY A BUNDLE — SAVE A BUNDLE!

Order one of these popular packages of products by number for Super Savings

<p>Package #1</p> <p>GEMINI 10X and XETEC GPI</p> <p>Popular printer and a graphic printer interface with 2k buffers.</p> <p>\$313.00</p>	<p>Package #7</p> <p>CONSULTANT and PAPERCLIP W/SPELLPACK</p> <p>These are the popular Database and Word Processor from Batteries Included</p> <p>\$129.99</p>
<p>Package #2</p> <p>GEMINI 10X and CARDCO GRAPHIC PRINTER INTERFACE</p> <p>\$309.00</p>	<p>Package #8</p> <p>PRACTICALC 64(d) and PRACTIFILE (d)</p> <p>You get real power from this Spreadsheet and Database from Practicorp (they also call themselves CSA or MSI, depending on who answers the phone) that integrate together</p> <p>\$69.99</p>
<p>Package #3</p> <p>POWERTYPE and XETEC SPI/B</p> <p>An 18 cps daisy wheel printer from Star Micronics and with the Xetec SPI/B, a serial printer interface with a 2k buffer.</p> <p>\$399.00</p>	<p>Package #9</p> <p>MIRAGE DATABASE, MIRAGE PROFESSIONAL WORD PROCESSOR, and MIRAGE ADVANCE REPORT GENERATOR</p> <p>A powerful package that integrates together</p> <p>only \$149.95</p>
<p>Package #4</p> <p>POWERTYPE and the CARDCO ?/B PRINTER INTERFACE</p> <p>\$385.00</p>	<p>Package #10</p> <p>BI-80 and PAPERCLIP W/SPELLPACK</p> <p>The 80 column card with Basic 4.0 built in, and Paperclip w/Spellpack both from Batteries Included. Paperclip works with the 80 column card to give you a powerful Word Processor.</p> <p>\$209.95</p>
<p>Package #5</p> <p>WP64 and SPELLPRO 64</p> <p>The word processor and spelling checker from Proline Software</p> <p>\$73.99</p>	<p>Package #11</p> <p>DATA MANAGER II and WORD WRITER</p> <p>A Word Processor and Database that integrate together for real power, at an unbelievable price! By Timeworks</p> <p>only \$64.99</p>
<p>Package #6</p> <p>1541 EXPRESS and the SMART CABLE</p> <p>Everything you need to speed up your disk drive 50-200% (1541 Express), and also run programs that access your printer (Smart Cable)</p> <p>Call for our LOW Price!</p>	

Tussey Mt. Software
Box 1006
State College, PA 16804

To Order By Mail — Send personal check, money order, or certified check. For fastest service send money order or certified check. Allow 2 weeks for personal checks to clear.
Shipping & Terms — Add \$2.50 per order for shipping software and accessories. Add \$6.00 per order for COD. Add \$10.00 to ship printers and disk drives. \$8.00 to ship monitors. COD orders not accepted on printers and monitors. Foreign orders: APO, FPO, AK, and HI require additional amounts for shipping. We pay shipping on backorders. Orders shipped UPS unless noted otherwise. All prices reflect cash discount. Visa/Mastercard add 3%. Manufacturer's warranty honored with our invoice and original packaging. PA residents add 6% sales tax. Prices subject to change.

PRODUCT MART

ORIGINAL ELECTRONIC BARTENDER

Let... **The Electronic Bartender** show you what drinks you can make using the ingredients you have on hand OR select recipes by name.

The Electronic Bartender

- Automatically multiplies recipes
- Displays the correct glass to use
- Has hundreds of recipes
- Is the perfect gift

SPECIFY: ★ IBM PC, PC Jr., XT
★ Apple II+, IIe, IIc ★ Commodore 64
★ Requires one disk drive

C.O.D. \$19.95
Order 24 hrs, 7 days

Call 800-348-2729, Extension 24
or send check or money order to:

WTC Publishing, Inc., Suite 25
131 N.W. Fourth St. • Corvallis, OR 97330

SSS WIN AT BLACKJACK SSS

Blackjack tutorial and game simulation. Lets you simulate play at all major casinos — A.C., L.V., Reno, Caribbean, Europe. Developed for beginning/advanced players. Teaches basic strategy and card counting. Includes copy of Jerry Patterson's best seller "Blackjack — A Winner's Handbook." Limited offer: \$49.95 + \$2.50 S/H

SS WIN AT BASKETBALL SSS

Beat the Vegas spread. NBA or college handicapping. Predict winning side, margin, over/under. 3-year win advantage of 62%. Easy to use; minimal data entry. Unique median/margin algorithm; proven correlation to winning SSS. Complete documentation included. Preseason offer: \$79.95 each (NBA, college) or \$129.95 for both. Please add \$2.50 S/H.

Commodore 64/VIC 20 • (16K) Disk/Cassette
VISA/MC, AMEX.

MicroScope Systems, Inc.
1 Britton Place #7
Voorhees, NJ 08043
(609)-772-2272.

MORE FROM COMORE

Talk to your C-64 disk operating system in plain English!

Comore's new CM/DOS machine language program accepts simple English commands from you like LOAD, SAVE, COPY, DELETE, and REPLACE and tells you drive the cumbersome strings it expects to hear.

Simplify your life! Order your copy of CM/DOS special \$29.95 (list 39.95) or get for more details in our catalog featuring user-aid and game software. Send \$1 for catalog + \$2 off coupon.

COMORE PRODUCTS

Dept. C64, Box 1431, Winter Park, FL 32790

Statistics Number Cruncher Statistics System. A menu-driven statistical system for C64 and V20.

Statistical Procedures
Multiple & Stepwise Regression. Correlation. Oneway ANOVA. Histograms. Univariate Stats. Cross Tabulation. Scatter Plotting. T-Tests. \$59.95

Dr. Jerry L. Hintze
865 East 400 North
Kaysville, Utah, 84037
1-801-546-0445

General Wizard

HOT!!!!	ARIZONA	PRICES
	(FOR C-64)	DISC or TAPE
	PROGRAMS	GIVE PRINT OUTS
	PROGRAM 1-2	\$24.95 EACH
	PROGRAM 3-4-5-6	ONLY \$19.95 EA

(1) MASTER CONVERSION PROGRAM (A) CONVERTS 200+ UNITS OF MEASURE (L INEAR/AREA/VOLUME/LIBRID/TROY/DRY/MARINERS - U.S. METRIC/BIBLICAL/ETC.) (B) DEC/HEX/BIN/OCT (C) TEMPERATURE - FAHRENHEIT/CELSIUS/KELVIN/RANKINE/REAHUR (D) LOAN AMORTIZATION (E) TRAVEL - MPG/MPH/FUEL - COST/TRAVEL - TIME/ETC (2) BABY NAMES - CHOOSE FROM OVER 2000 NAMES AND ADD YOUR OWN. COMPUTER WILL PRINT ALL POSSIBLE COMBINATIONS OF THE CHOSEN NAMES + YOUR LAST NAME (EX. 20 1ST & 2ND NAMES=400 COMBINATIONS.) PRINTS ANNOUNCEMENTS AND POSTERS (3) BOY / GIRL. AND IT WILL EVEN PRINT A FAMILY TREE!!!!!! (4) WORLD TIME - THIS PROGRAM WILL DISPLAY THE LOCAL TIME AND CURRENT TIME IN 162 COUNTRIES AND ENTIRE U.S.A. (5) FOREIGN OR FOREIGN TO U.S. - USES JAN. 1989. 176 COUNTRIES CAN INPUT CURRENT RATES - BIBLICAL CURRENCES/DATES/BIRTH DATES/ETC. INTO NUMBERS FOR COMPARING NUMBERS ARE REDUCED TO ONE & TWO DIGITS. GIVES PERCENT DIFFERENTIAL RESULTS (6) NUMBER SYSTEMS - THIS PROGRAM WILL CONVERT ANY NUMBER IN SYSTEM TO ANY OTHER SYSTEM (HEX AND DEC ANSWER IN BINAR). (7) VISUALS UNLIMITED P.O. BOX 37350, P.A. ARIZ. 85049 \$29.95 (8) VISIT - HAND. /C.O.D. ADD \$4.00/FOREIGN ADD \$4.00 (9) ADD AS TRY/CHECK OR M.O. (PERS. CHECKS - 3 WEEKS TO CLEAR) (10) ORDER THREE OR MORE PROGRAMS DEDUCT \$2 PER PROGRAM ** ** PRICES ARE U.S. CURRENCY ** SOME PROGRAMS FOR VIC AL80

C-64 COVERS

PROTECT YOUR INVESTMENT

- CUSTOM FIT • LIGHT TAN •
- LIFETIME WARRANTY •
- WASHABLE •

VIC-20/C-64 COMPUTER
C-1541 DISK DRIVE
C-1530 DATASETTE
C-1525 PRINTER
MPS-801 PRINTER
GEMINI-10/10X PRINTER
EPSON FX80 PRINTER
1701/1702 MONITOR

* ALL COVERS *
* \$6.95 each *

Enclose a check or M/O. for items ordered + \$2.00 shipping & handling. CA. Residents add 6.5% tax

DES-PRODUCTIONS
9067 BUHMAN ST.
DOWNEY, CA 90240
Dealer's Invited

HAVE YOU GOT THE 1541 BLUES?



WE'VE GOT THE PERMANENT FIX!!

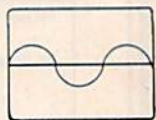
Send us your sick 1541 and a check for \$69.95 plus 5.00 shipping and we'll not only align your drive, we'll fix it so it will STAY THAT WAY.

We guarantee it for 6 months.

We also service the complete COMMODORE COMPUTER LINE with a 48-hour turn-around time.

TRIAD COMPUTERS
3068 Trenwest Dr.
Winston-Salem, NC 27103 (919)765-0433

C-64 DS™



Color Digital Oscilloscope \$249

- Add-on peripheral converts C-64 to 4-channel digital oscilloscope.
- 4.5" x 7" box plugs into user port.
- 2 MHz sampling rate.
- 500 KHZ analog bandwidth.
- Simple menu driven operation.
- Stores/retrieves waveforms on disk or cassette.
- Gains and timebase controlled from keyboard.
- Spectrum analyzer software available.
- Specify disk or cassette software.

Send: **Rapid Systems Inc.** call:
5415 136th Pl. S.E. 206-641-2141
Bellevue, WA 98006

\$249

Prices subject to change without notice

FAMILY TREE (REVISED)

PETI-GREE (NEW)

FAMILY TREE — Keep track of your ancestry with pedigree charts and family record sheets from our popular program that has now been updated and revised. 664 names per disk, up to 6 generation charts, improved editing, more user friendly. \$49.95 U.S.

PETI-GREE — A new program for the dog breeder and kennel operator that keeps A.K.C. records and produces required pedigree charts and information files.

For information write or phone:
GENEALOGY SOFTWARE

Phone 519-344-3990

P.O. Box 1151
Port Huron, Michigan 48061
1046 Parkwood Ave.
Sarnia, Ontario N7V 3T9

WIZARD'S DOMINION



ONLY THE BRAVEST DARE TO ENTER!! ARM YOUR CHARACTER WITH WEAPONS AND MAGIC. THEN FIND GOLD AND FIGHT OGRES AND GAIN NEW MAGICAL POWERS.

- 3-D PERSPECTIVE
- SUPERB GRAPHICS
- COMPLEX BATTLES
- LOTS OF MAGIC
- THOUSANDS OF CAVES

COMMODORE 64
TI 99/4A (EXTENDED BASIC)
CASSETTE \$19.95 DISK \$21.95

DEALER INQUIRIES WELCOME

INSTRUCTIONS INCLUDED. To order send check or money order plus \$1.50 shipping/handling to:



American Software
Design & Distribution Co.
P.O. Box 246 Dept. G-6
Cottage Grove, MN 55016

The Gardener's Assistant

to Plan and Plot Your Garden Efficiently



- Graphic display of garden layout
- Recommended planting dimensions
- Planting/harvesting dates for your region
- Quantity to buy and plant
- For the novice gardener, operates with minimal input Easy to use
- For the experienced gardener, allows tailoring and expansion of all data including addition of specialty crops
- Data on Over 50 Vegetables Included

Commodore 64, \$29.95 - Apple II+, \$39.95

IBM PC, IBM PCjr, \$45.00

(VA add 4% sales tax)



Shannon Software, Ltd.

PO Box 6126 Falls Church, VA 22046
Phone (703) 573-9274

Presenting

FLYERS

Tired of shooting spaceships?
Tired of running around in mazes?
Flyers will give you a change...
You are a bird. You are trying to get food... insects, frogs. But there are dangers. Watch out for the hawks and eagles! Beware of the hunter!

\$29.95

C-64/Disk/Joystick required

Send check or money order to:

SIRJ

906 S. ANN BLVD.

HARKER HEIGHTS, TX 76541

MASTER THE MYSTERIES OF THE COMMODORE 64



Learn to program like a pro

- Easy structured lessons
- Fully explained experiments
- Software disk contains: sound tutor, music demo, machine language monitor, sprite editor, and more
- All for only \$49.95 + \$2.00 postage and handling
- Specify Disk or Cassette

Also Available:

The Commodore 64 VIC-II Chip explained... \$10.95

The Commodore 64 SID chip explained... \$10.95

Add \$1.00 postage and handling

Order NOW! Send check or money order to:

THE COMPUTER TUTOR

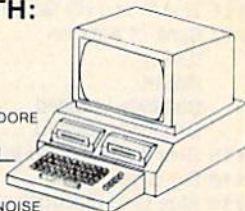
Box 183, Grandville, MI 49418

THE COOL APPROACH FOR HOT 1541 DRIVES WORKS WITH:

C-64
VIC-20
TED 16

MAKES YOUR COMMODORE SYSTEM LOOK NEAT AND CLEAN

PROTECTS YOUR INVESTMENT FROM HEAT, DUST, AC LINE NOISE



MODEL C241 INCLUDES:

Housing For Two 1541 Drives & Your Commodore Caps For Front & Rear (Single Drive Owners), Enclosed Fan, Positive Pressure, Filtered Air, User Cleanable External Filter Pad, Total System Power Distribution Eight Switched, 6 AMP Fused & Filtered Power Outlets (3 Pin), Surge Protected Color Matched With C-64 & 1541 Drives.

PRICE: \$175 (Includes Handling & UPS Shipping)
Allow 5-6 Weeks Delivery (MN Residents Add 6% Sales Tax)



Associated Data Products

P.O. BOX 437, SAVAGE, MN 55378

COMPUTERIZED

Yahrtzee

Finally, a REAL Yahrtzee game for the Commodore 64. Includes the following advanced features:
-fast action graphics with sound effects
-option to play against "CHIP" the computer
-all time High Score sheet (disk version)
-authentic-looking scorecard
-one to five players

Disk or Cassette: \$16.95

also: The COMPLETE Home Inventory
Easily user-defined fields, items categorized by area. Titles and items can be edited easily at any time with a few simple keystrokes. Sort up or down by any item. Can be configured to support almost any printer. If you need help, there are online help screens to guide you.

Disk only: \$18.95

Reliable Software
340 Nine Mile Rd. N.E.
Covington Park, MI 49321
Phone (616) 784-1446

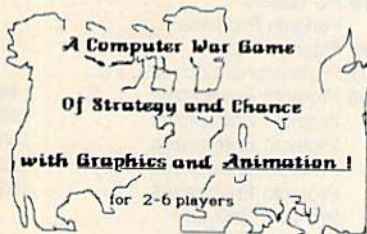
Check, Money Order, Charge, C.O.D. orders add \$1.00
Michigan Residents Add 4% Sales Tax



NEW

NEW

GLOBAL CONQUEST



A Computer War Game
Of Strategy and Chance
with Graphics and Animation!
for 2-6 players

The ULTIMATE Christmas Gift
\$29.95 Disc or Cassette
For the Commodore 64 & Atari Computers

CALIFORNIA DREAMERS
P.O. Box 178, Seven Mile, Ohio 45062

COMMODORE 64 INTERFACING BLUE BOOK

Written by a college professor in a friendly and informative style, this book is a gold mine of practical information on how to build a variety of useful interfaces for your computer. Over 30 projects including cassette interface, printer interface, expansion bus, light pen, RS-232 interface, more user ports, thermometer, speech synthesizer and two other voice projects, A/D and D/A converters, 5 telephone interfaces including a sophisticated voice mail project, motor controllers, AC power control, logic analyzer, capacitance meter, spectrum analyzer, home security system and many more. \$16.95 postpaid. Foreign orders add \$3 for AIR MAIL shipping.

VIC 20 INTERFACING BLUE BOOK

30 hardware interfacing projects for the VIC 20. Similar to the 64 book above. See what your VIC can do with a little interfacing. \$14.95 postpaid.

microsignal
Dept. C, P.O. BOX 22
MILLWOOD, NY 10546

ADVERTISERS INDEX

Reader Service Number/Advertiser	Page	Reader Service Number/Advertiser	Page	Reader Service Number/Advertiser	Page
102 A A Computer Exchange	222	Electronic Arts	29	173 Sega Enterprises, Inc.	46,47
103 Abacus Software	137	Electronic Arts	31	Shannon Software, Ltd.	227
104 Abacus Software	139	142 E Mart, Inc.	165	Sierra On-Line, Inc.	61
105 Abacus Software	141	143 Eng Mfg., Inc.	51	174 Sight & Sound Music Software, Inc.	2,3
106 Academy Software	59	Epyx	41	175 Signal Computer Consultant, Ltd.	216
107 Access Software Incorporated	119	Epyx	43	SIRJ	227
A.I.D. Corp.	222	Epyx	45	176 Skyles Electric Works	209
108 Almost-Free-Software	212	144 Ergo Systems, Inc.	133	Softlaw	87
American Broadcasting Companies, Inc.	168	145 Full Circle Software, Inc.	140	177 Software Discounters of America	208
American Software Design & Distribution Co.	227	Future Visions Unlimited	226	178 Software Masters	113
Apropos Technology	221	Genealogy Software	227	179 Software Plus	210
109 Artificial Intelligence Research Group	214	146 Genesis Computer Corporation	213	Software Publishing Corporation	57
110 Associated Data Products	227	147 The Gold Disk	125	The Software Sector, Inc.	90
111 The Avalon Hill Game Company	7	John Henry Software	20	180 Software Warehouse Outlet	212
112 Bank of America	131	John Henry Software	79	Southern Oregon Video Enterprises, Inc.	166
BASIX	111	Dr. Jerry L. Hintze	226	Spinnaker	1
BASIX	224	148 Indus Systems	123	181 Starpoint Software	50
Batteries Included	89	149 Infocom, Inc.	14,15	Strategic Simulations Inc.	77
Batteries Included	91	150 Inforunner Corporation	49	182 subLOGIC Corporation	81
113 Bear Technologies Inc.	220	Inkwell Systems	76	183 subLOGIC Corporation	97
114 Big Bytes	171	Innovative Organizers	135	184 Superior Micro Systems, Inc.	216
115 Blue Chip Electronics	121	Intelligent Software	166	185 Systems Management Associates	207
R. J. Brachman Associates, Inc.	222	151 International Self-Help Institute	160	186 Systems Management Associates	219
Brantford Educational Services	220	Jason-Ranheim	113	187 Tailored Solutions	218
116 Broadway Computer Corporation	176	KSOFT	176	188 Taroco	2
117 Broderbund Software	24,25	152 Kyan Software	220	189 Telesys	72
118 Broderbund Software	75	Loadstar	167	190 Tenex Computer Express	127
119 Bytes & Pieces, Inc.	223	Lycos Computer	211	191 Timeworks, Inc.	27
120 California Dreamers	227	153 MFJ Enterprises Incorporated	214	Triad Computers	226
121 Cardco, Inc.	IBC	Micol Systems	160	Trillium	99
Cardinal Software	216	154 Microcomscribe	59	192 Tussey Mt. Software	225
122 Cheatsheet Products	224	155 MicroProse Software	103	Ultrabyte	167
123 Chromazone Software	218	156 Microsci, Inc.	51	Ultrabyte	171
124 Columbia Software	210	157 MicroScope Systems, Inc.	226	193 Waveform Corporation	63
Commodore	BC	Microsignal	227	194 Winmar Enterprises Ltd.	214
125 Comm 64 Training Tape	162	158 Micro-W Distributing, Inc.	44	195 Woodbury Software	71
Comore Products	226	Micro World Electronix, Inc.	171	196 Word Publishing	IFC
126 CompuServe	19	Micro World Electronix, Inc.	176	WTC Publishing, Inc.	226
ComputAbility	129	159 Mimic Systems Inc.	109	Xerox Education Publications	65
Computer Mail Order	215	160 Mindscape, Inc.	38,39		
Computer Management Corporation	218	161 Mindscape, Inc.	67		
Computer Place	210	162 NET Software	107		
127 Computer Profit Systems, Inc.	117	163 Okidata	33-36	COMPUTE!'s Books	105
Computer Revelations, Inc.	222	164 Orange Micro Inc.	55	COMPUTE!'s Gazette Back Issues	206
The Computer Tutor	227	Orion Enterprises	51	COMPUTE!'s Gazette Disk	69
128 Covox, Inc.	224	165 PC Gallery	217	COMPUTE!'s Gazette Subscription	85
Creative Software	4	Penguin Products	72	Home Computer Ware	101
129 Crown Custom Covers	216	166 Playnet, Inc.	53	Programming the VIC	115
130 C.S.M. Software	160	167 Professional Software, Inc.	13		
131 Currah Technology	17	168 Protecto Enterprises	144,145		
132 Datamost Inc.	159	Protecto Enterprises	146,147		
133 Datamost, Inc.	163	Protecto Enterprises	148,149		
134 Datasoft, Inc.	68	Protecto Enterprises	150,151		
135 Datasoft, Inc.	93	Protecto Enterprises	152,153		
136 Datasoft, Inc.	95	Pro-Line Software	98		
137 Davidson & Associates	73	Pro-Line Software	134		
138 DES-Productions	226	169 PSI	9		
139 Digital Vision, Inc.	222	Quantum Software	222		
140 Dow Jones News/Retrieval	165	170 Quicksilva Inc.	83		
Dynastar Productions	218	171 Radix Marketing	94		
141 Eastern House	106	Rapid Systems Inc.	226		
Elcomp Publishing, Inc.	208	Reliable Software	227		
		Rockney Disk Utilities	214		
		172 Scarborough Systems, Inc.	11		
		SchuLace Enterprises	218		

C/? PS = Serial and Parallel Printer Interface for Commodore

C/? AT = Parallel Printer Interface for Atari

MT/1 = Remote Control Television Tuner for video monitors

MT/2 = Television Tuner for video monitors



Cardco offers a new class of products



PS- NEW CARDCO PRINTER INTERFACE for the Commodore-64™ and VIC-20™ Personal Computers. Use with any standard parallel OR serial printer. Requires no special programming. Ready to hook-up; includes all necessary cables and plugs. **CARD/?PS**

AT- NEW CARDCO PRINTER INTERFACE for the ATARI COMPUTER. Use your Atari Computer with any standard parallel input printer . . . impact dot matrix, thermal dot matrix, daisy wheel, letter quality, ink jet and laser printer, **CARD/?AT** includes all necessary cables and connectors.

MT/1 MONITOR TUNER with REMOTE CONTROL for any composite color monitor to **TURN YOUR MONITOR** into a **TELEVISION SET**. Receive sharper, clearer television pictures on your composite color monitor with a flick of the switch. Separate audio and video outputs; also for stereo sound systems.

MT/2-UHF/VHF MONITOR TUNER to turn any composite color monitor into a television set. For color or monochrome monitors; has separate audio and video outputs; receives vivid, bright television pictures that will amaze you.

CARDCO is constantly producing new products to enhance your enjoyment and value from your computer. A full line of Commodore hardware and software; letter quality printers for any computer; TV monitor tuners for any composite color monitors and a host of other quality computer products. All available wherever computers and peripherals are sold. **WRITE** for **FREE** illustrated literature and prices.



cardco, inc.

300 S. Topeka
Wichita, Kansas 67202
(316) 267-6525

"The world's largest manufacturer of Commodore accessories."

Commodore™ is a registered trademark of Commodore Business Systems, Inc.

LOOK WHAT'S ON TELEVISION TONIGHT.

6:00

THE HULK

The first comic attraction in the QUESTPROBE™ Adventure Series. You become a super hero. A joint (ad)venture of Scott Adams, Inc. and Marvel Comics Group. (Diskette)



7:30

SOLAR FOX

It's erase or be erased as you navigate spaceship over a grid of colorful pulsating entities, armed with laser. Unlimited levels. A BALLY MIDWAY original. (Cartridge)



9:00

MAGIC DESK I

MAGIC DESK I

The scene opens on an office desk, complete with digital clock, typewriter, wastebasket and file cabinet. Select functions (typing, filing, editing) by pointing animated finger. (Cartridge)



6:30

MATH FACTS

(Ages 5 to 10) (Micro School) Educational TV. Practice in basic math facts. Several levels. (Easy to hard) (Diskette)



8:00



EASY SCRIPT

Our best wordprocessor. Displays 764 lines by 40 characters. Prints over 130 columns. Global/local search/replace/hunt/find. Super/subscripts. Insert/delete characters, lines, sentences, paragraphs. (Diskette)

9:30

INTERNATIONAL SOCCER

(Gold Medallion Game) Sports highlight. With passing, kicking, diving goalies, even trophies! Great color; 3-D realism. No locker room interviews. (Cartridge)



7:00



FRENZY/ FLIP FLOP

(Ages 6 to 14) (Milliken Edufun) FRENZY (subtraction and division) The hungry gator arrives... save the fish... play the BONUS game... FLIP FLOP (transformed geometry) look at the two figures... do they need to flip, turn or slide? (Diskette)

8:30

THE MANAGER

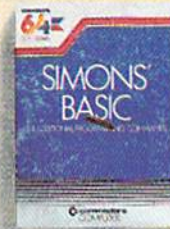
A powerful database management system. For business, educational or personal files. Not for Rockford's files. With four built-in applications. Or design your own. (Diskette)



10:00

SIMONS' BASIC

Rated PG. Expands Commodore BASIC by an additional 114 commands. Convenient programming commands such as RE-NUMBER and TRACE plus graphics plotting command. (Cartridge)



Announcing the most exciting variety show on television.

Featuring many of the stars of arcade games, education and the business world.

Produced by (and for) Commodore, the people who bring you the Commodore 64™, a 64K computer that would be a value at three times its price. In fact, many of its competitors are three times its price.

Produced in living high resolution graphics with 16 available colors and with eight 3-dimensional sprites.

With a real high fidelity sound that covers a 9-octave range.

And a supporting cast of low-price, high capacity disk drives, printers, monitors (a better way to watch Commodore 64) and modems.

So, if you're not pleased with what's on your tv set tonight, simply turn on your Commodore 64.

COMMODORE 64
IT'S NOT HOW LITTLE IT COSTS,
IT'S HOW MUCH YOU GET.

