

Fun, Games
and Beyond with

commodore

Home Computers

Volume I, Number 3 Winter 1982 \$2.50

POWER PLAY

C O M P U T I N G

The Computer-Controlled Home
is Happening—Now
Score Higher in Omega Race:
Tips from the Champ
Making Music on the Commodore 64



SPECIAL 8-PAGE GAMES INSERT

Your VIC 20 never had it so good!



VIC 20 owners rejoice! HES presents a complete range of software from our exciting series of games to our professional group of utility and language programs.

Our new cartridge programs include: HES MON, an indispensable monitor for assembly language programmers; HES WRITER, a

word processing program; Turtle Graphics, a fun and easy way to learn computer programming; and VIC FORTH, a powerful language that is many times faster than BASIC, yet easier to use than assembly language.

HES is committed to offering high-quality, well-documented computer programs on a continual basis. Look for our cartridge and cassette based software at your local dealer.

HES

Human Engineered Software
71 Park Lane
Brisbane, California 94005
Telephone 415-468-4110

POWERPLAY

C O N T E N T S



The VIC Magician 16



Slither 33

Making Friends with Sid 44



Braindrops from the editor.....	2
We're Glad You Asked Answers to reader questions.....	3
Access: Commodore User Groups	4
User Hints	6

The Computer-Controlled Home is Possible—Now With devices like the Homebrain, you can manage your home more efficiently.....	11
A VIC Piano Use your VIC 20 keyboard to make a little music.....	15
The VIC Magician Random numbers and animation techniques from our resident wizard by Michael Tomczyk.....	16
The Great Computer Rivalry How the VIC 20 stacks up against the competition by Neil Harris.....	22
Joysticks, Paddles and Lightpens An excerpt from the upcoming <i>Commodore 64 Programmer's Reference Guide</i>	24
Coupon Control Use this program to keep track of store coupons and save money by Doug Holub.....	26
Deflection Type and save this game for any Commodore computer, and learn a little in the process by Neil Harris.....	30
A Joystick Version of Slither For those who have the early keyboard version of Slither by Paul Zander.....	33
Omega Race: The Finer Points Advice on how to score from the present champ by David Berezowski.....	38
Behind the Programs An interview with Rick Madge, creator of Garden Wars.....	40
High Scores	41
VIC Baseball Winner of the June Commodore Challenge contest. Type and save the program listing. by Mark Biggs.....	42
Making Friends with Sid The first in a series on music synthesization on the Commodore 64 by Paul Higginbottom.....	44
A Little Exercise in Machine Language Get a feel for your computer's native language by Jim Butterfield.....	50
Tele/Scope Test your M.Q. (Modem Quotient) by Jeff Hand.....	54
New Products	57
Book Review: John O'Brien reviews Tim Hartnell's <i>Getting Acquainted with Your VIC 20</i>	58
Program Review: Commodore's <i>BASIC Programming, Part II</i> teach-yourself-programming package by Mike Heck.....	59
No More Pencils, No More Books: How Captain Zurgle Saved His Ship with Commodore's Visible Solar System Cartridge, and Learned about Home Babysitter, Too. Reviewed by Ned Horn.....	61
Get Serious What's happening on the POWERful side of Commodore.....	65
Program Review: VICMON by Bruce Robinson.....	66
Commodore VIC 20 Price List	67

Braindrops

Publishing Manager

Neil Harris

Editor

Diane LeBold

Staff Writers

David Berezowski
Jeff Hand
Paul Higginbottom
Bill Hindorff
Ned Horn
John O'Brien

Contributing Writers

Mike Heck
Doug Holub
Bruce Robinson
Paul Zander
Jim Butterfield

Technical Editors

Paul Goheen
Michael Tomczyk

Technical Staff

Jeff Bruette
Rick Cotton
Larry Ercolino
Bill Hindorff
Pat McAllister
Cyndie Merten
Dave Middleton
Sue Mitnacht

Circulation Manager

John O'Brien

Advertising Manager

Diane LeBold



I'm beginning to develop a split personality. I first noticed it when I sat down to write the "Get Serious" column for this issue—formerly the responsibility of the congenitally stodgy Paul Fleming, who, until September was editor of *Commodore Magazine*. Well, it turns out that I've inherited Paul's magazine and all its stodgy accoutrements,

in addition to the fun and games of *Power/Play*, at least for the time being. That doesn't bother me, except that it means when I need a "Get Serious" column for *Power/Play*, who has to write it? Me.

It's not that I don't like the serious side of Commodore's products. In fact, serious applications can be pretty exciting, sometimes. But look at it from this perspective. Here I am, having great fun putting together this issue of *Power/Play*. The special games insert looks terrific, Paul Higginbottom has done a super job on his introduction to producing music on the 64, I'm really turned on about the possibilities of the Homebrain, I'm playing all the nifty games submitted to the Commodore Challenge Contest... and then boom! I've got to sit down and Get Serious. Put on my Serious Commodore Magazine Editor head and pretend I'm stodgy. For a person of my temperament, this is not easy.

I'm not sure I pulled it off. In fact, I suspect I won't fool you for a minute into thinking I'm at all serious, and I've been feeling terribly guilty about it. It seems as if my only alternative is to develop two distinct and separate personalities. Maybe arrange it so one eye can read only green screens, the other only full color. Or devise a potion, a la Dr. Jekyll, that makes me unable to operate a joystick for several hours, so I have to concentrate on what some people around here call "real" applications, at least for short periods. Any suggestions?

While you're here, I'd like to point out that our own Neil Harris, whom you may remember as one of the technical editors of this book, has been dragged away from his job as all-purpose know-it-all and been forced to do something constructive—namely serve as Publishing Manager for both our user magazines. As we all knew he would, Neil has taken over the reins of this rampant pair of publications with grace and aplomb, and has already begun implementing his master plan for spreading the Commodore word into every nook and cranny of the civilized (?) world.

Oh, and one more thing. On behalf of everyone here at Commodore, I'd like to wish you a safe, happy holiday and a prosperous, peaceful 1983!

Diane LeBold



ON THE COVER: Santa risks life and limb crossing the Oregon battlefield to make sure all our readers get their new VIC 20 games for Christmas. See our exciting games insert for details.

Cover Art: Reed Dixon
Magazine Design: Partners Graphic Design Studio
Production Coordinator: Terri Lepley
Printing: Steckel Printing, Inc.

POWER/PLAY is published quarterly by the Computer Systems Division, Commodore Business Machines, Inc., The Meadows, 487 Devon Park Drive, Wayne, PA 19087. Copyright © 1982, Commodore Electronics Ltd. U.S. Subscriber rate: \$10.00 per year. Canadian subscriber rate is \$15.00 and overseas \$17.00 per year. No material may be reprinted without permission. Volume I, Number 3.

We're Glad You Asked...

Q How does one "trap" the RUN/STOP key on the VIC 20? I am presently working on a pre-school program and am using GET statements instead of INPUT statements when I want an operator's response. Unfortunately, though, a child may inadvertently break the program by hitting the RUN/STOP key. I was unable to "trap" the RUN/STOP key in the usual manner, using GET A\$ and the CHR\$ ("X") function. I suspect one has to POKE the VIC's memory to trap the key, but where?

A You're entirely correct. To disable, POKE 788,194. To re-enable, POKE 788,191. You can use these commands wherever appropriate in your program. Side effect: this also traps the real time clock (TI and TIS).

Q How does one protect a VIC 20 program from being copyable?

A It's virtually impossible to protect any program from a determined thief. This is particularly true with programs on cassette. However, if you want to protect a program from a relatively inexperienced copycat, a simple technique is to put part of it (maybe some subroutines or calculations) into machine language. Because machine language is stored in a different part of memory than BASIC, if someone tries to copy the program by simply SAVEing from tape or disk, only the BASIC part of the program will be saved. And the thief will be foiled because the program will not run without the hidden machine language.

Q I want to use my VIC 20 with expanded memory AND the VIC-MODEM. How can I override the current prohibition? My work involves preparing texts at home, then calling a university computer to download the texts to add to other files and print on the high-quality printers.

A A fairly simple task. Plug in the memory expander you intend to use with the VICMODEM, type in the Terminal Software program in the VICMODEM manual and save it (with the memory expander in place). When you load and run, you've got the use of both expander and modem.

Q Why are these calculations not exact:

PRINT exponents of
 $3 \uparrow 4 = 81.0000001$
 $3 \uparrow 6 = 729.000001$
etc.

A The problem is caused by rounding errors introduced when the computer converts decimal numbers to and from binary numbers. There are several ways around these inaccuracies, but the easiest one is to have the computer print only the first four or five (or seven, or whatever, depending on where the inaccuracy begins) numbers it sees.

Q Is there some way to look at what's in my VIC's memory?

A The best way is to use the VICMON cartridge. But if you don't have one, this little program will permit you to look inside your VIC's memory:

```
10 X=X+1
20 PRINT CHR$(PEEK(X));
30 Y=Y+1:IF Y=500 THEN PRINT
   "CLR/HOME" "X:Y=0"
40 GOTO 10
```

When you type this in and RUN, the VIC will print on the screen each character stored in each of the 65535 memory locations. Since many locations are not in the VIC itself but in plug-in cartridges, when they are being addressed there will be no display. Also, if you'd like a less flashy but more informative display, change line 20 to:

```
Z=PEEK(X):PRINTZ;
```

This will give you the value in

each location, rather than the character itself. For more information on what you're seeing on the screen, check your VIC 20 Programmer's Reference Guide, Appendix F. (Thanks to the VIC-NIC News, Box 981, Salem, NH 03079 for part of this tip.)

Q In the Fall 1982 issue of Power/Play you said it is not possible to restore the VIC back to its unexpanded state without removing the expander cartridges. Actually, restoring the VIC back to its unexpanded state is possible without removing the expander cartridge. UMI's BASIC Utility Program, BUTI (pronounced "beauty"), includes a command for setting the VIC to its unexpanded, VIC plus 3K, and VIC plus 8K or more configurations (if memory is available) without removing any cartridge.

Also, our experience has indicated that, when an 8K or 16K memory expander is added, the start of screen memory is at 4096 decimal, while the start of BASIC is at 4608 decimal. Your column said that under these conditions the start of BASIC is at 4096.

Sincerely,
David Lundberg
Technical Director,
United Microware Industries, Inc.

A Sorry we missed that simple error concerning the start of BASIC. Thanks for catching it.

Career And Freelance Opportunities With Commodore For Games And Graphics Developers And Designers

We are currently looking for talented people with the capacity to create software games in assembly language, with outstanding play appeal and graphic design for the VIC 20 and CBM 64 microcomputers.

The individuals we are looking for may wish to work for us on a full or part-time basis, either in Valley Forge, PA or where you are now situated. We're not interested in where you will be, only that you're happy creating for yourself and us.

You may have either one or both of the talents necessary—the ability to create a new game with terrific play appeal and/or the ability to create excellent graphics on either the VIC or the CBM 64. If you have both talents—GREAT! If not, we'll team you up with a partner.

Compensation is wide open including full-time salaried situations or compensation based upon specific work performed. If you have an interest in telling us more about yourself, please write or send a resume to us at the address below. Better yet, if you have a sample of your work on diskette, cartridge or cassette—include it with your letter or resume.

All properties sent to us will be kept confidential and returned to you after evaluation if desired.

Address all inquiries to: John Mathias, Recreation Software,
Commodore Business Machines, 487 Devon Park Drive, Wayne, PA 19087

Access: Commodore User Groups

User groups have what we call a synergistic effect. That is, cooperative effort achieves things that individuals probably couldn't accomplish independently.

To encourage that cooperation, and help you get the most out of your home computing experience, this section of POWER/PLAY is devoted to getting users together.

Let us know what your group is doing, send messages via free "classified" style ads, or simply list your group. We'll do whatever works to help you contact other users and/or get the information you need.

ALABAMA

Huntsville PET Users Club
9002 Berclair Rd.
Huntsville, AL 35802
Hal Carey

ARIZONA

VIC Users Group
1206 N. Fraser Drive
Mesa, AZ 85203
Paul V. Muffuletto

ARKANSAS

Commodore/PET
Users Club
Conway Middle School
Davis Street
Conway, AR 72032
Geneva Bowlin

CALIFORNIA

Lawrence Hall of Science
UC Berkeley
Computer Project,
Room 254
Berkeley, CA 94720
415-642-3598

California VIC
Users Group
"VIC-VILLE"

c/o Data Equipment
Supply Corp.
8315 Firestone Blvd.
Downey, CA 90241
213-923-9361

Meet second Tues.
of month

Valley Computer Club
2006 Magnolia Blvd.
Burbank, CA
213-849-4094

Meet first Wed. of
month, 6 pm

Valley Computer Club
1913 Booth Road
Ceres, CA 95307

PUG of Silicon Valley
22355 Rancho Ventura
Road
Cupertino, CA 95014

BAMBUG
1450 53rd Street
Emeryville, CA
415-523-7396

North Orange County
Computer Club
3030 Topaz Apt. A
Fullerton, CA 92631
Dave Smith

Lincoln Computer Club
750 E. Yosemite
Manteca, CA 95336
John Fung, advisor

PET on the Air
525 Crestlake Drive
San Francisco, CA 94132
Max J. Babin, secretary

PALS (PETs Around
Livermore Society)
886 South K
Livermore, CA 94550
John Rambo

SPHINX

314 10th Avenue
Oakland, CA
415-451-6364
Every 2nd & 4th Thurs.

San Diego PUG
c/o D. Costarakis
3562 Union Street
714-235-7626
7 am-4 pm

Walnut Creek PET
Users Club
1815 Ygnacio Valley
Road
Walnut Creek, CA 94546

SCPUG
c/o Data Equipment
Supply Corp.
8315 Firestone Blvd.
Downey, CA 90241
213-923-9361

Commodore Users Club
1041 Foxenwoods Drive
Santa Maria, CA 93455
805-937-4106
Greg Johnson

Vincent Yanniello's
VIC 20 Software
Exchange Club
2130 Colby Avenue
West Los Angeles,
CA 90025
213-479-3000

PET/CBM/VIC User Club
c/o General Computer
Store
22323 Sherman Way #9
Canoga Park, CA
91303
213-889-2211, ext. 2118
Tom Lynch

Computer Palace
User Group
1029 E. Broadway
Glendale, CA 91205
213-241-2551

The Commodore
Connection
2301 Mission St.
Santa Cruz, CA 95060
408-425-8054
Bud Massey

Jurupa Wizards
4256 Kingsbury Pl.
Riverside, CA 92503
Walter J. Scott

COLORADO

VICKIMPET Users Group
4 Waring La.
Greenwood Village
Littleton, CO 80121
Louis Roehrs

CONNECTICUT

John F. Garbano
Skiff Lane Masons Island
Mystic, CT 06355
203-536-9789

Commodore Users Club
Wetherfield
High School
411 Wolcott Hill Road
Wetherfield, CT 06109
Daniel G. Spaneas

New London County
Commodore Club
Doolittle Rd.

Preston, CT 06360
Dr. Walter Doolittle

VIC Users Club
22 Tunxis Rd.
West Hartford, CT 06107
Edward Barszczewski

FLORIDA

Jacksonville Area
PET Society
401 Monument Rd. #177
Jacksonville, FL 32211

Richard Prestien
6278 SW 14th Street
Miami, FL 33144

South Florida PET
Users Group
7170 S.W. 11th
West Hollywood, FL
33023
305-987-6982
Dave Young

VIC Users Club
4071 Edgewater Dr.
Orlando, FL 32804
Ray Thigpen

IDAHO

GHS Computer Club
c/o Grangeville
High School
910 D Street
Grangeville, ID 83530
208-983-0580
Don Kissinger

ILLINOIS

Shelly Wernikoff
2731 N.
Milwaukee Avenue
Chicago, IL 60647

Central Illinois PET
User Group
635 Maple
Mount Zion, IL 62549
217-864-5320
Jim Oldfield

3rd Friday of month
PET VIC Club (PVC)
40 S. Lincoln
Mundelein, IL 60060
Paul Schmidt, president

Rockford Area PET
Users Group
1608 Benton Street
Rockford, IL 61107

VIC 20/64 Users
Support Group
114 S. Clark St.
Pana, IL 62557
David R. Tarvin

VIC Chicago Club
3822 N. Bell Ave.
Chicago, IL 60618
John L. Rosengarten

ASM/TED User Group
200 S. Century
Rantoul, IL 61866
217-893-4577
Brant Anderson

Commodore Users Club
1707 E. Main St.
Olney, IL 62450
David E. Lawless

INDIANA

PET Users
P.O. Box 36014
Indianapolis, IN 46236
317-898-3604
Jerry Brinson

CHUG (Commodore
Hardware Users Group)
12104 Meadow Lane
Oakland, IN 46236
Ted Powell

Cardinal Sales
6225 Coffman Road
Indianapolis, IN 46268
317-298-9650
Carol Wheeler

VIC Indy Club
P.O. Box 11543
Indianapolis, IN 46201
317-898-8023
Ken Ralston

IOWA

PET Users Group
c/o Don Vormies
1321 42 St., SE
Cedar Rapids, IA 52403

Commodore User Group
114 8th St.
Ames, IA 50010

Quad City
Commodore Club
1721 Grant St.
Bettendorf, IA 52722
319-355-2641
John Yigas

KANSAS

Wichita Area PET
Users Group
2231 Bullinger
Wichita, KS 67204
316-838-0518
Mel Zandler

Commodore User Group
6050 S. 183 St. W.
Viola, KS 67149
Walter Lounsbury

Kansas Commodore
Computer Club
101 S. Burch
Olathe, KS 66061
Paul B. Howard

KENTUCKY

The VIC Connection
1010 South Elm
Henderson, KY 42420
502-827-8153
Jim Kemp

LOUISIANA

Franklin Parish
Computer Club
#3 Fair Ave.
Winnsboro, LA 71295
James D. Mays, Sr.

NOVA

917 Gordon St.
New Orleans, LA 70117
504-948-7643
Kenneth McGruder, Sr.

MARYLAND

Association of Personal
Computer Users
5014 Rodman Road
Bethesda, MD 20016

House of Commodore
8835 Satyr Hill Rd.
Baltimore, MD 21234
Ernest J. Fischer

Blue TUSK
700 E. Joppa Rd.
Baltimore, MD 21204
Jim Hauff

MASSACHUSETTS

Commodore Users Club
Stoughton High School
Stoughton, MA 02072
Mike Lennon

Berkshire PET Lovers
CBM Users Group
Taconic High
Pittsfield, MA 01201

The Boston
Computer Society
Three Center Plaza
Boston, MA 02108
617-367-8080
Mary E. McCann

Eastern Massachusetts
VIC User Group
7 Flagg Rd.
Marlboro, MA 02173
Frank Ordway

VIC Users Group
193 Garden St.
Needham, MA 02192
Ilene Hoffman-Sholar

MICHIGAN

David Liem
14361 Warwick Street
Detroit, MI 48223

Toledo PETs
734 Donna Drive
Temperance, MI 48182
Gerald Carter, president

Commodore User Club
32303 Columbus Drive
Warren, MI 48093
Robert Steinbrecher

VIC Users Club
University of Michigan
School of Public Health
Ann Arbor, MI 48109
John Gannon

VIC Commodore Club
2765 Bristol Rd.
Dowling, MI 49050
Bill Kelley

Commodore Users Group
3947 W. 12 Mile Rd.
Berkley, MI 48072
c/o Family Computer

MINNESOTA

Twin Cities Commodore
Computer Club
6623 Ives Lane
Maple Grove, MN 55369
612-424-2425
Rollie Schmidt

Minnesota Users of PET
P.O. Box 179
Annandale, MN 55302
Jon T. Minerich

MISSOURI

Clearwater Club
Clearwater School
Star Route
Piedmont, MO 63957
Carolyn Polk

PETSET Club of St. Louis
1501 Carman Rd.
Manchester, MO 63011
314-527-3236
Ed or Til Keil

KCPUG
5214 Blue Ridge Blvd.
Kansas City, MO 64133
816-356-2382
Rick West

MONTANA

Powder River
Computer Club
Powder River County
High School
Broadus, MT 59317
Jim Sampson

Commodore User Club
1109 West Broadway
Butte, MT 59701
Mike McCarthy

NEVADA

Las Vegas PET Users
4884 Iron Avenue
Las Vegas, NV 89110

NEW HAMPSHIRE

Northern New England
Computer Society
P.O. Box 69
Berlin, NH 03570

TBH VIC-NICS
P.O. Box 981
Salem, NH 03079

NEW JERSEY

Amateur Computer Group
18 Alpine Drive
Wayne, NJ 07470

Somerset Users Club
49 Marcy Street
Somerset, NJ 08873
Robert Holzer

VIC-TIMES

46 Wayne St.
Edison, NJ 08817

NEW YORK

Capital District PET Users
Albany, NY
518-370-1820
Ben Green

Long Island PET Society
Harborfields H.S.
Taylor Avenue
Greenlawn, NY 11740
Ralph Bressler

PET User Club
of Westchester
Box 1280
White Plains, NY 10602
Ben Meyer

LIVE (Long Island VIC
Enthusiasts)
17 Picadilly Road
Great Neck, NY 11023
Arnold Friedman

CTA VIC Users Group
183 Avondale Dr.
Centereach, NY 11720
Bernie Schlesinger

Poughkeepsie VIC
Users Group
2 Brooklands Farm Rd.
Poughkeepsie, NY 12601
Joe Steinman

West Chester County
VIC Users Group
P.O. Box 146
Pelham, NY 10552
Joe Brown

SuperPET User Group
4782 Boston Post Rd.
Pelham, NY 10803
Paul Skipski

VIC 20 User Club
151-28 22nd Ave.
Whitestone, NY 11357
Jean F. Coppola

VIC 20 User Club
399 Park Ave.
Babylon, NY 11702
516-669-9126
Gary Overman

VIC User Group
1250 Ocean Ave.
Brooklyn, NY 11230
212-859-3030
Dr. Levitt

Commodore Masters
25 Cronon Ave.
Staten Island, NY 10301
Stephen Farkouh

VIC Users Club
76 Radford St.
Staten Island, NY 10314
Michael Frantz

VIC Users Club
44 Harvey Ave.
Staten Island, NY 10314
Christopher Kwasnicki

PUG of Rockland County
14 Hillside Ct.
Suffern, NY 10901
914-354-7439
Ross Garber

NORTH CAROLINA

Amateur Radio PET
User's Group
P.O. Box 30694
Raleigh, NC 27622
Hank Roth

Commodore Users Club
4241 Castleton Road
Charlotte, NC 28211
Ed Harris

Microcomputer Users Club
Box 17142
Bethabara Sta.
Winston-Salem, NC
27116
Joel D. Brown

VIC Users Club
Route 3, Box 351
Lincolnton, NC 28092
David C. Fonenberry

VIC Users Club
Rt. 11, Box 686
Hickory, NC 28601
Tim Gromlovits

OHIO

Dayton Area PET
User Group
933 Livingston Drive
Xenia, OH 45385
513-848-2065
B. Worby, president

Central Ohio PET
Users Group
107 S. Westmoor Avenue
Columbus, OH 43204
614-274-6451
Philip H. Lynch

OKLAHOMA Southwest Oklahoma Computer Club 4311 Floyd Ave. NW Lawton, OK 73505 Joe Teeplees	Pittsburgh PET Group 2015 Garrick Dr. Pittsburgh, PA 15235 412-371-2882 Joel A. Casar	Commodore User Club Metro Computer Center 1800 Dayton Blvd. Chattanooga, TN 37405 Mondays 7:30 pm	Utah PUG 2236 Washington Blvd. Ogden, UT 84401 Jack Fleck	PET Users Group 1800 Taylor Ave. N102 Seattle, WA 98102 Kenneth Tong	PET User Club R.R. 6 Simcoe, Ontario N3Y 4K5 Vancouver PET Users Group Box 91164 West Vancouver, British Columbia V7V 3N6
OREGON NW PET Users Group 2134 N.E. 45th Avenue Portland, OR 97213 John F. Jones	N.W.P.A. CBM Users 320 Maryland Ave. Erie, PA 16505 814-456-4786 Tom Kuklinski	TEXAS SCOPE 1020 Summit Circle Carrollton, TX 75006	The Commodore Users' Club 742 Taylor Avenue Ogden, UT 84404 Todd Woods Kap, president	WISCONSIN Sewpus c/o Theodore J. Polozynski P.O. Box 21851 Milwaukee, WI 53221	KOREA Commodore Users Club K.P.O. Box 1437 Seoul S.K. Cha
PENNSYLVANIA Penn Conference Computer Club c/o Penn Conference of SDA 720 Museum Road Reading, PA 19611 Dan R. Knapp	PUERTO RICO CUG of Puerto Rico 1607 Calle Colon Santurce, PR 00911 Ken Burch	PET Users 2001 Bryan Tower Suite 3800 Dallas, TX 75201	VIRGINIA Northern VA PET Users 2045 Eakins Court Reston, VA 22091 703-860-9116 Bob Karpen	Waukesha Area Commodore User Group 256 1/2 W. Broadway Waukesha, WI 53186 414-547-9391 Walter Sadler	MEXICO Club de Usuarios Commodore Sigma del Norte Mol del Valle, Local 44 Garza Garcia, N.L. 66220
PET User Group P.O. Box 371 Montgomeryville, PA 18936 Gene Beals	SOUTH DAKOTA PET User Group 515 South Duff Mitchell, SD 57301 605-996-8277 Jim Dallas	Commodore Houston Users Group 8738 Wildforest Houston, TX 77088 713-999-3650 John Walker	Dale City Commodore User Group 14752 Danville Rd. Dale City, VA 22193 703-680-2270 James Hogler	CANADA Toronto PET Users Group 381 Lawrence Ave. West Toronto, Ontario Canada M5M 1B9 416-782-9252 Chris Bennett	Asociacion de Usuarios Commodore c/o Alejandro Lopez Arechiga Holbein 174-6 Piso Mexico 18, D.F.
PACS PET Users Group 20th & Olney Street Philadelphia, PA Glen Schwartz 8097 Avon Philadelphia, PA 19116 Gene Planchak 4820 Anne Lane Sharpsville, PA 15150 412-962-9682	TENNESSEE River City Computer Hobbyists Memphis, TN First Mon. at Main Library Nashville VIC Users Group American Computer Store 1004 8th Ave., S. Nashville, TN 37203 615-242-8592 Jane Maggard 1st Thurs. of month, 6 pm	PET User Group Texas A & M Microcomputer Club Texas A & M, TX John Bowen Corpus Christi Commodores 3650 Topeka St. Corpus Christi, TX 78411 512-852-7665 Bob McKelvy	VIC Users Group Rt. 2, Box 180 Lynchburg, VA 24501 Dick Rossignol VIC Users Group 1502 Harvard Rd. Richmond, VA 23226 Donnie L. Thompson	Canadian Commodore Computer Club c/o Strictly Commodore 47 Coachwood Place Calgary, Alberta T3H 1E1 Canada Roger Olanson	NORWAY VIC Club of Norway Nedre Bankegt 10 1750 Halden Norway
Bucks County Commodore User Group 72 East Rambler Drive Holland, PA 18966 215-322-0394 Jim Dubrouillet		UTAH The VIClic 799 Ponderosa Drive Sandy, UT 84070 Steve Graham	WASHINGTON NW PET Users Group 2565 Dexter N. #203 Seattle, WA 98109 Richard Ball VIC 20 Computer Club 947 N. Burroughs Ave. Oak Harbor, WA 98277 Michael D. Clark	W.P.U.G. 9-300 Enniskillen Ave. Winnipeg, Manitoba R2V 0H9 Larry Neufeld	

USER BULLETIN BOARD

USER GROUPS FORMING

FLORIDA

VIC 20 User Group now forming.
Contact Robert D. Campbell
c/o Newberry Fire Station
P.O. Box 747
Newberry, FL 32669
904-472-2137

VIC User Group forming:
Contact Bob Kirksey
7624 Las Vegas Lane
Pensacola, FL 32504

GEORGIA

Commodore User Group forming:
Contact Bruce Godley
615 Northway Lane
Atlanta, GA 30342
404-252-9890

ILLINOIS

VIC club now forming in Chicago.
Contact John Leon at 312-267-4935
between 9 and 5, Monday-Friday.

VIC International Computer Knowledge
Information Exchange (VICKIE):
International clearinghouse and news-
letter devoted to VIC 20 and Commo-
dore 64 now forming. Membership \$20/
year, \$17.50 for students. Contact: John
L. Rosengarten, President
VICKIE
3822 N. Bell Ave.
Chicago, IL 60618

BRILEY SOFTWARE

For VIC-20 and PET!

C103 HOME INVENTORY (12K)

Insurance inventory of home or office.
In-memory file handling. Add, Delete,
Update, Search, Sort, Print, List, Load
Save. Only one cassette drive needed.
\$19.95

C105 GROCERY MART (5K)

Map favorite grocery store with items
and prices. Calculates cost in advance.
Listed by aisle. Uses data statements.
\$14.95

C106 DINNER'S ON! (5K)

Menu planner for up to 15 days. Shop-
ping list for bulk purchases. Uses favorite
meals (with ingredients) in data
statements. PET has dessert feature.
VIC \$12.95 PET \$14.95

To Order: Send check (U.S.
funds), add tax if Calif., \$.75/
cass. for shipping. Specify VIC or
PET.

Publishing Application and Personal
Software since 1979. Dealer and author
inquiries invited. Catalog available for
SASE.



P.O. BOX 2913
LIVERMORE, CA
94550-0291
(415) 455-9139

User Hints

from the Wichita VIC 20 Group Newsletter

Our VIC 20 user group in Wichita regularly produces a newsletter full of useful hints and interesting insights. These are a few items from that newsletter we thought might be of interest to the rest of our users. By the way, we'd like to see more of your newsletters, so if you're producing one, please put us on your complimentary subscription list.

The VIC 20 Programmer's Aid Cartridge

Walt Lounsbery
Wichita, KS

After working with large mainframe computers like the VAX 11/780 or IBM 370, we tend to get spoiled by their full-screen editors, program debugging features, and use of special function keys. It becomes difficult for us to get along without them. Well, if you are frustrated by the lack of these features on the VIC 20 or if you do much programming at all, you should welcome the Programmer's Aid cartridge by Commodore. It adds utilities and new BASIC commands that most mini-computers lack, making program development a snap.

To be sure, this cartridge is most useful with a memory expansion. Although it occupies a high memory ROM slot, certain functions require the use of 122 bytes at the top of program memory. This can be critical for the basic VIC. Personally, I feel that this is a very small price to pay. The cost of the cartridge is more of a consideration, though, at about \$60. There are no free bargains.

In deference to those learning about programming with your VIC, the following list of commands include a short description. If you have not used features like these before, I would highly recommend trying out the cartridge at a dealer to see how helpful they are. The commands are:

Auto—Automatic line numbers for program entry. It is possible to specify the first line number and the difference between line numbers. If program lines are in memory, it will start at the end of the current program.

Change—This powerful command will search the entire program or a specified line number range for a particular BASIC command or string (the string must be in quotes). It will also locate variables. All occurrences in the range will be changed to a new command, string, or variable that you specify. This command can screw up REM statements since it does not know what they are.

Delete—Deletes program lines. Operates just like the LIST commands, so you can delete all lines before a line number, from a line to another line, or all lines after a line number.

Jump—Displays the values of all variables in a program at the time of execution, except array variables. If there are many variables in the program, it may be wise to use CMD 4 and DUMP the variables to the printer!

Edit—Change the function key assignments to the EDIT mode.

Find—Find BASIC code or character string enclosed in quotes. This can operate over a specified line range. It displays each line with the desired code or string.

Help—Upon an execution error in a program, HELP can be immediately entered from the keyboard to display the line in which the error occurred and the position of the error on the line will be highlighted in reverse characters.

Key—Display the current special function key assignments. Keys can be assigned different functions or commands, up to ten characters.

Kill—Disable the Programmer's Aid cartridge. This is desirable in time dependent programs as the cartridge operation slows down the program.

Merge—This adds program lines from the cassette or disk drive to the program in memory.

Off—Turns off the TRACE or STEP functions.

Prog—Activates the PROGRAM mode special key assignments.

Renumber—Renumbers program lines, altering all GOTOs, GOSUBs, and so on to correspond to the new line numbers. The first line number and the line number increment can be specified. The entire program is always renumbered.

Step—Runs one line of the program each time the shift key is pressed. The line number that has executed appears in a reverse field "window" at the upper right corner of the screen.

Trace—Displays the line number in execution. The line numbers are scrolled through a small reverse field "window" at the upper right corner of the screen. Speed of the program can be slowed by pressing the control key or the shift key.

These commands are very powerful additions for editing or running BASIC programs. In fact, the manual does a good job of fully describing these functions, except the KEY function. It is important to know that if the special function keys are reassigned through the PROG OR EDIT commands, the key assignments that have been made by you will be erased and lost. Up till now those assignments have not been listed here. They are:

PROGRAM MODE

UnSHIFTed
(KEY 1) F1—LIST
(KEY 3) F3—RUN (ret)
(KEY 5) F5—GOTO
(KEY 7) F7—INPUT
SHIFTed
(KEY 2) F2—MIDS
(KEY 4) F4—LEFT\$(
(KEY 6) F6—RIGHT\$(

EDIT MODE

F1—LIST
F3—RUN (ret)
F5—DELETE
F7—TRACE (ret)
F2—AUTO
F4—DELETE
F6—CHANGE

(continued on page 51)

**MIGHTY "V"
TO THE
RESCUE**



VIC 20*

**BUSINESS AND HOME SOFTWARE
That'll KNOCK your Mainframe OUT!!**

BY TSASA

Now available on cassettes -

<input type="checkbox"/> 1. THE MORTGAGE CALCULATOR C	\$ 8.95
<input type="checkbox"/> 2. THE GASOLINE UN-GUZZLER C	\$ 8.95
<input type="checkbox"/> 3. THE BILLING SOLVER	\$19.95
<input type="checkbox"/> 4. THE CLIENT TICKLER C P	\$19.95
<input type="checkbox"/> 5. THE TAPE GENI C P	\$ 9.95
<input type="checkbox"/> 6. THE ACCOUNTANT C P	\$29.95
<input type="checkbox"/> 7. THE BAR CHART C P	\$ 8.95
<input type="checkbox"/> 8. CASH FLOW C	\$13.95
<input type="checkbox"/> 9. THE DEPRECIATOR C	\$10.95
<input type="checkbox"/> 10. BUSINESS INVENTORY C P	\$18.95
<input type="checkbox"/> 11. THE BIDDER C	\$14.95
<input type="checkbox"/> 12. THE TEMPERATURE CONVERTER C	\$ 8.95
<input type="checkbox"/> 13. FIND THE WORDS C P	\$10.95
<input type="checkbox"/> 14. DEAR DIARY C	\$12.95
<input type="checkbox"/> 15. PROFIT SHARING PLAN C	\$18.95
<input type="checkbox"/> 16. LEASE/BUY? C	\$14.95
<input type="checkbox"/> 17. RATIOS C	\$ 8.95
<input type="checkbox"/> 18. PRESENT VALUE C	\$12.95
<input type="checkbox"/> 19. THE SYNDICATOR C	\$15.95
<input type="checkbox"/> 20. MOTHER'S RECIPES C P	\$12.95
<input type="checkbox"/> 21. THE TAPE WORM C	\$12.95
<input type="checkbox"/> 22. THE CLUB LISTER C	\$13.95
<input type="checkbox"/> 23. AT HOME INVENTORY C	\$12.95
<input type="checkbox"/> 24. UTILITY BILL SOLVER C	\$12.95
<input type="checkbox"/> 25. VICKY-CALC C	\$12.95
<input type="checkbox"/> 26. BIRTHDAY GUESSEER C	\$ 8.95
<input type="checkbox"/> 27. THE METRIC BRAIN C	\$10.95
<input type="checkbox"/> 28. ROLL DA' DICE C	\$12.95
<input type="checkbox"/> 29. THE TICKER TAPE C	\$16.95
<input type="checkbox"/> 30. THE SUPER BROKER C	\$12.95
<input type="checkbox"/> 31. THE MORTGAGE COMPARER C	\$ 8.95
<input type="checkbox"/> 32. THE RULE OF '78 C	\$ 9.95
<input type="checkbox"/> 33. MATH-A-MAGICIAN C	\$14.95
<input type="checkbox"/> 34. HOME BUDGET C	\$12.95
<input type="checkbox"/> 35. IT'S TRAVEL TIME C	\$10.95
<input type="checkbox"/> 36. YOUR MEDICAL RECORDS C P	\$14.95
<input type="checkbox"/> 37. THE INVESTMENT ANALYST C	\$12.95
<input type="checkbox"/> 38. THE PHONE DIRECTORY C P	\$ 9.95
<input type="checkbox"/> 39. THE AMORTIZER P	\$24.95
<input type="checkbox"/> 40. THE CHECKBOOK BOOKY C P	\$12.95
<input type="checkbox"/> 41. THE INCOME & EXPENSER C P	\$14.95
<input type="checkbox"/> 42. THE LOAN REPAYER C	\$10.95
<input type="checkbox"/> 43. MY CREDIT CARDS C P	\$14.95
<input type="checkbox"/> 44. GRADE MY KIDS C P	\$14.95
<input type="checkbox"/> 45. NET WORTH STATEMENT C P	\$14.95
<input type="checkbox"/> 46. THE SAVINGS ACCOUNT MIZER C	\$13.95
<input type="checkbox"/> 47. CALENDAR MY APPOINTMENTS P	\$16.95
<input type="checkbox"/> 48. MIXED UP WORDS C	\$ 8.95
<input type="checkbox"/> 49. THE BUDGETER C	\$15.95
<input type="checkbox"/> 50. PRINT MY PROGRAM P	\$ 8.95

JUST RELEASED

<input type="checkbox"/> 51. JOGGER'S LOGGER C	\$11.95
<input type="checkbox"/> 52. NUISMATIC PHANATIC C	\$12.95
<input type="checkbox"/> 53. SUPER SHOPPER C P	\$12.95
<input type="checkbox"/> 54. P.E.R.T. MY VIC C	\$16.95
<input type="checkbox"/> 55. LINEAR REGRESS C	\$16.95
<input type="checkbox"/> 56. STATISTIC SADISTICS C	\$16.95
<input type="checkbox"/> 57. TRACK MY WEIGHT C	\$12.95
<input type="checkbox"/> 58. LIGHTNING SORT C	\$12.95
<input type="checkbox"/> 59. GOLF SCORECARD C	\$11.95
<input type="checkbox"/> 60. ORDER TRACKER C P	\$18.95

© Copyright TSASA 1981

FREE CATALOG

Specify CRT/TV (C) or (P) Printer
Programs available direct from TSASA or at fine
Computer Dealers Nationwide

DEALER INQUIRIES WELCOME

Send check or MO with \$1.50 TSASA
Postage & Handling
COD add \$1.50

NAME _____

ADDRESS _____

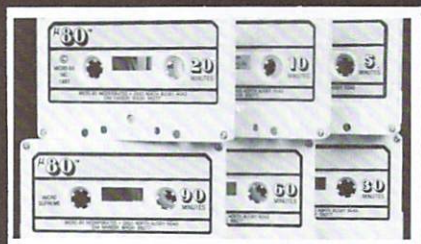
CITY _____

STATE _____ ZIP _____

☐ SEND FREE CATALOG

Mail to: 2 Chipley Run
West Berlin, NJ 08091
Telephone (609)346-3063

**COMPUTER CASSETTES
100% ERROR-FREE**



LENGTH	12 PACK	24 PACK
C-05.....	69¢	59¢
C-10.....	79¢	69¢
C-20.....	99¢	89¢

- Fully Guaranteed!
- World's Finest Media
- Custom Storage Case, Add 20¢ Each
- UPS Shipping Add \$3.00 Per Pack

FOR ORDERS ONLY

1-800-528-6050 Ext. 3005
In Arizona; 1-800-352-0458 Ext. 3005

MICRO-80™ INC.

master charge VISA
V-2665 NO. BUSBY ROAD
OAK HARBOR, WA 98277

ENGINEERING TYPE

SOFTWARE

FOR THE VIC 20

*DIMENSIONAL STACK UP
STD MEM. 0/PRT 9.50

*ROTARY FLOW DIVIDER
8K EXP 0/PRT 19.50

*COMPOSITE BEAMS
8k EXP 0/PRT 24.50

HARRY F. LEONARD
5556 CHERRYWOOD RD.
COLUMBUS OHIO, 43229
PHONE 614/846-1823



**Reach
for
MICRO-ED!**

**Over 500
Educational
Programs for**

- Pet
- Vic

and

**• The new
Commodore 64**

**Send for FREE CATALOG
SPECIFY MICRO**

**Please Send me your
FREE CATALOG(S)**

Name _____

Address _____

City _____

State _____ Zip _____

for ☐ PET ☐ VIC

☐ **New**

Commodore 64

**Micro-Ed, Inc.
P.O. Box 24156
Minneapolis, MN 55424**

**You can call
us at
612-926-2292**

The Joy Of Shopping

To all our shoppers far and near
The season for fun and savings is here.

For dear ol' Mom a gift she craves
A brand new shiny Microwave.

Give your Dad a Seiko watch
Instead of that same old bottle of Scotch.

The hard-working student is back at school
He'd love a Stereo; he's no fool.

For the girl with the beautiful wardrobe dreams
Select from our Singer sewing machines.

The new-born in the family will simply croon
Over a Tiffany rattle or Silver Spoon.

Next on your list are Nana and Gramps
Glued to a VCR instead of collector stamps

To make very happy your Uncle Louie
Offer him a package from Sansui.

Last but not least, a Walkman from Sony
Will perk up Aunt Ruthy, the one and only.

Whatever your choices your money buys more
From Amana to Zenith through Comp-U-Store!

Happy Holidays!

Join COMPU-STORE to use your home terminal to shop for over
50,000 name-brand products and save up to 40% off list.
Convenient use of MasterCard, VISA or check. Only \$25. annual
membership fee with connect-time of \$5. per standard hour.
Money-back satisfaction guaranteed. To join or for more information,
Call Toll-Free Weekdays 9AM to 5PM EST.



A service of
Comp-U-Card of America
800-243-9000
(In Connecticut 800-942-3315)



METEOR RUN

UMI games...for the fun of VIC®

You're in command with Meteor Run . . . guiding your craft through treacherous meteor fields . . . fighting alien ships . . . dodging exploding photon torpedos . . . fighting your way to the red star, Alderbaran. The closer you get, the more hazards you encounter. You're surrounded with challenging adventure! This action-packed game will hold you spellbound for hours. Just imagine the fun you'll have!!

UMI provides thrilling entertainment with a variety of top-notch, arcade quality games. They're designed to play better, have more action and last longer than most.

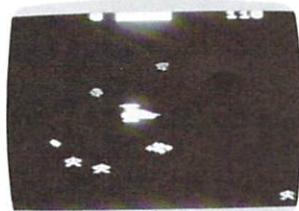
All games come on low-cost cassettes or on UMI's own durable cartridges. So live it up, take your pick of games from United Microware today. Send for a catalog or contact the UMI distributor nearest you and start the good times rolling. After all, it's just for the fun of VIC®!!



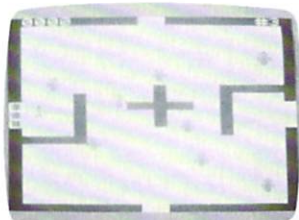
United Microware Industries, Inc.
3503-C Temple Avenue
Pomona, CA 91768
(714) 594-1351

VIC is a registered trademark of Commodore Business Machines.

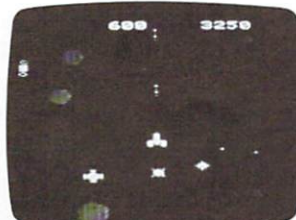
Look at these exciting choices:



Meteor Run — 1613



Amok — 1611



Satellites & Meteorites — 1650



Renaissance — 1600

TYPING CAN
BE FUN!

FOR THE VIC-20®

**Rated the TOP educational program
for the VIC-20 by Creative Computing Magazine*

- **TYPING TUTOR* — \$12.95**

If you've ever wanted to learn touch typing, this is for you! Makes learning the keyboard much easier. 4 programs on one tape teach the keys in the correct progression starting with the easy "home keys." Automatically advances to new keys as your skills develop. Ideal for beginning children, old "hunt & peck" typists, and to refresh old typing skills. Highly praised by customers: "Typing Tutor is great," "Fantastic," "Excellent," "High Quality."

- **WORD INVADERS — \$10.95**

Put excitement into your touch typing practice! Blast the invading words out of the sky before your base is destroyed. Four levels of difficulty match the letters as learned on our TYPING TUTOR program. Typing can be fun!

SAVE. ORDER BOTH OF THE ABOVE PROGRAMS AS "TYPING TUTOR PLUS" FOR ONLY \$21.95

- **FLASHCARD MAKER & FLASHCARD QUIZ — \$10.95**

2 programs. Prepare your own study material and make it easier to learn. Use for English/Foreign words, etc. Quiz program has options for study, full test, and easy learning mode. Keeps score and allows re-test of missed questions or of entire set. Includes sample data on tape with 50 States and their Capitals.

(ALL PROGRAMS ON CASSETTE TAPE AND RUN IN THE UNEXPANDED VIC)

FOR THE COMMODORE 64®

- **SPRITE DESIGNER by Dr. Lee T. Hill — \$16.95**

Save hours of work when designing sprites. Helps you create multiple sprites, copy and alter them to create views from different perspectives automatically for 3-D or animated effects. Options include: copy any of the previous sprites, reflection, rotation, translation, shearing, reverse image, merge & intersect. Saves all sprite data for easy merge into your program.

SHIPPING AND HANDLING \$1.00 PER ORDER. CALIFORNIA RESIDENTS ADD 6% SALES TAX.

VISA AND MASTERCARD ORDERS MUST INCLUDE FULL NAME AS SHOWN ON CARD, CARD NUMBER, AND EXPIRATION DATE.



ACADEMY SOFTWARE
P.O. BOX 9403



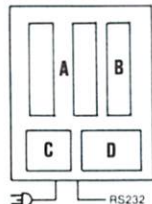
SAN RAFAEL, CA 94912

(415) 499-0850

Programmers. Write to our New Program Manager concerning any exceptional VIC-20 or C64 game or other program you have developed.

THE HOMEBRAIN™ IS the First Total Home Control Computer

The **HOMEBRAIN™** is a dedicated microcomputer system in a stand-alone package. **HOMEBRAIN'S™** I/O potential exceeds 300 channels.



- A -32 Channels Buffered Input
- B -8 Relay Output
- C -Uninterruptible Power Supply
- D -CPU, Communications, 256 Channel AC Wireless Control

ACHIEVE TOTAL HOME CONTROL

- Energy Management
- Home Security
- Lighting Control
- Safety Monitoring
- Appliance Control

- Over 300 devices may be connected to the HomeBrain™ or controlled through wireless BSR-X10* or Leviton* modules.
- Communicate with HomeBrain™ USING YOUR Commodore VIC20 or other personal computer. We provide software allowing your personal computer to talk to HomeBrain™.
- When not communicating with HomeBrain™ you may disconnect your VIC20 and use it for other purposes or even turn it off.
- The HomeBrain™ operates totally independent of your communicator. It is unaffected by brownouts and even operates through blackouts.

Your home is always under HomeBrain™'s protection and control.

EVALUATE THE HOMEBRAIN™

Order Now By Calling Toll-Free

1-800-228-2028 EXT. 332

Lines Open 9 AM To 7 PM E.S.T.



Just give us your Name, Shipping, Address and Visa or MasterCard number and we will charge the \$850.00 purchase price, plus \$20.00 shipping (N.J. residents add 5% sales tax) to your account. Or, **SEND*** your **CHECK*** or **MONEY ORDER*** to:

HYPERTek, INC.

**30-4 FARM ROAD
SOMERVILLE, NEW JERSEY 08876**

*Sending your check will qualify you for an INTRODUCTORY REBATE of 10%.

Allow 6-8 weeks for delivery.
If you have any questions concerning applications or installation, please call:
201-874-4773

*BSR-X10 is a trademark of BSR Corporation.

*LEVITON is a trademark of Leviton Mfg. Co., Inc.

NOW! THE PERFECT ENHANCEMENT TO YOUR COMMODORE HOME SYSTEM.

The Computer-Controlled Home is Possible—Now

With your Commodore computer and a Homebrain, computer management is becoming affordable to the average family.



This model home in Bridgewater, New Jersey, looks normal, but it has computer control as standard equipment.

It's time to stop acting as if computer-controlled homes were science fiction or decadent fantasy-fulfillment for the very rich. The fact is, if you're a home owner, have children, pets or aging parents living with you, or work away from home, computer control of certain facets of your home not only can help you save money and time, but can help ease your mind in ways you probably never considered before.

And here's the kicker. With a VIC 20 (or any computer) and the Homebrain from Hypertek, Inc., in Somerville, New Jersey, you can set up a completely computer-controlled home for about the same price as installing a security system.

What does computer control mean to an average family? Pardon me if I go right for the pocketbook: it means you can save a significant amount of money on your heating and cooling bills.

But that's far from the whole story. It also means your home is secured against break-in, and, in conjunction with a smoke detector, your family protected if a fire starts. That, if you're at work, you can know if your children don't get home from school by a certain time, or your elderly parent isn't up and around—through the same kind of motion detectors used in security systems, connected, in this case, to a modem that let's the Homebrain phone your office.

On the lighter, just slightly decadent side, it

also means you can have your coffee ready when you get up in the morning, your roast turned on so it's cooked by the time you get home, your lawn watered, your lights turned on or off automatically when you enter or leave an area, your garage door opened, your clothes dried and dishes washed, and, if you have a pet door installed, your pet let in and out.

And if you're away for a long period of time, it means you can call your Homebrain on the phone, using a computer and modem, to change its instructions or get a read-out on what's been going on around the house. This is not science fiction. It's possible—and affordable—right now.

Let's talk about the possibilities for home energy management, first. The Homebrain can be programmed to decide the most efficient times to turn heating or cooling off or on (and in which rooms), or choose which energy source to use, should you have more than one. And, if you have time-of-day rates available in your area, you can program the Homebrain to decide the most cost-effective time to run costly appliances like clothes dryers.

To understand exactly how computerized home energy management works, let's digress briefly to take a look at the "Future I" model home in Georgia, where a Commodore 8032 computer is managing several energy systems as part of an experiment in home energy



In the kitchen of the model home, the VIC 20 and monitor can be hooked up to communicate with the Homebrain in the basement.

conservation. Future I uses a combination of photovoltaic, passive solar, and standard electric (including a heat pump) for most of its energy. The computer's job is to decide which energy system to employ and when, to obtain the most cost savings.

For instance, during a summer day, when the photovoltaic cells are generating energy like crazy and not much energy is being consumed by the house, the computer might decide to run the dryer. Or, better yet, it might sell the excess energy back to the power company to get credit for the household's account. (During those times it would also be sure to close the blinds in the passive solar collector room.) When the power company's rates go down, during low-usage times, the CBM might turn on the dishwasher. The results of this experiment are showing that computerized energy management of this type can lead to substantial savings on the energy bills of a typical household. (For the full story on Future I, see the December issue of *Commodore Magazine*.)

According to Marty Burns, president and founder of Hypertek, Inc., the Homebrain can be programmed to take over all these same kinds of energy management functions. The advantage of operating through a Homebrain rather than directly through a computer, according to Burns, is that once you program the Homebrain, you can then unhook the computer.

"That way the computer isn't tied up all the time running the house," Burns points out. "So you can still use it to play games, or perform other home management functions. Or, especially with a VIC or a 64, you could even take the computer with you if you go on a trip, and use it to communicate with your Homebrain via a modem

to change the program or find out what's been going on—from thousands of miles away."

In a more conventional household than one like Future I, the Homebrain will turn down the heat or air conditioning when you leave for work, and turn them back up just before you return. If you'd like to track energy losses in your house, program the Homebrain to monitor the number of times thermostats go on in various areas. Or, if you want to get elaborate, use motion detectors to have the Homebrain turn on heating or cooling in only the rooms where motion is sensed, and turn it off again after a given time period of no motion.

The Homebrain also serves as a home security monitor, using motion sensors at doors and windows to detect any unwanted presence. What happens once a break-in is suspected is pretty much up to the individual home owner. The Homebrain can be programmed to do anything from simply turning on lights to sounding alarms and dialing up the local police. Of course, false alarm prevention can be programmed in, too.

When it comes to fire detection, the Homebrain works through a standard smoke detector system. Once the smoke detector is activated, Marty Burns says, the Homebrain can turn on all the lights in the house, sound alarms, call the fire company and, importantly, shut down the heating and ventilating systems to prevent circulation of smoke. Again, false alarm prevention can be built into the system. You don't want the fire company banging down your door because the toast burned.

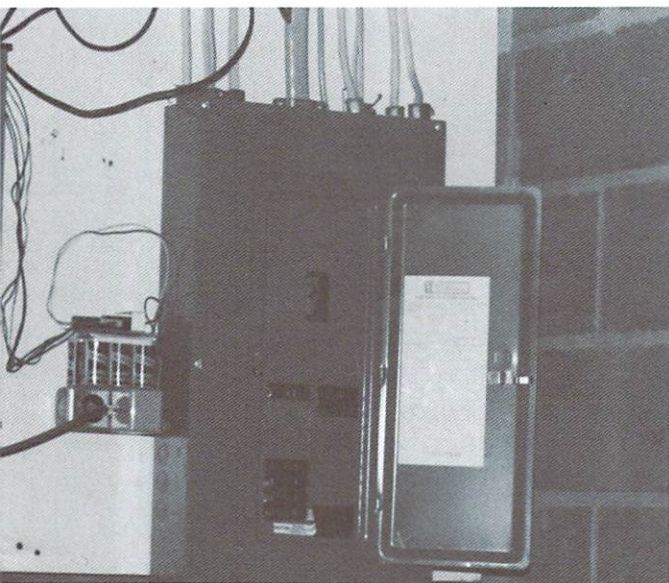
Another of the Homebrain's fortés is lighting up your life—and making sure the lights are out when they're supposed to be. On those dark mornings when you stumble into the hall on the way to the bathroom, there's no need to bump into that chair. With the help of a motion





The Homebrain: Will computer control become a standard feature in new homes?

Marty Burns, president of Hypertek, Inc., with the Homebrain he has tucked away inconspicuously in the basement of the New Jersey model home.



detector, the Homebrain will turn on the hall light for you, then turn it off a little later.

Coming home late from work? The Homebrain will have the porch light burning. Going on vacation? Switch into "vacation mode" and the Homebrain will turn lights on in a slightly random fashion to simulate your presence—in addition, of course, to turning down the heat, arming the security system and monitoring whatever else needs monitoring, including how many times people come to the door and how much energy is being used.


According to Burns, installation of a Homebrain is not difficult. Right now Hypertek is in the process of installing one in a model home in Bridgewater, New Jersey, a pleasant—and very normal-looking—suburb about 15 miles outside Princeton. In this house, the VIC and monitor can be hooked up in the kitchen when you need to talk to the Homebrain or reprogram it, but the Homebrain itself is tucked away inconspicuously in the basement, next to the circuit breaker box.

Burns says wiring is kept to a minimum through the use of BSR-X10 power line carriers in switches, outlets and appliance modules. These remote control modules, available in most home improvement centers, allow the Homebrain to inject a signal right into the existing AC line, so no additional wiring is required for many common household devices. Motion detectors and other devices that require additional wiring are hooked up with low-voltage intercom wire to the Homebrain.

"The beauty of the Homebrain system," Burns says, "is that we can program it to do anything you can dream up. When we set up the system, we sit down and work out everything you want it to do, reduce it to a logical system, and program it in. A homeowner can do the programming him- or herself—or can do it with assistance from our professional installers."

In addition, the Homebrain also has its own uninterruptible power supply that maintains power up to three hours for selected functions. In the event of a power failure that lasts longer than three hours, the Homebrain remembers where everything was set, so when power is restored, it resets everything to its proper function level.

If all this sounds interesting, here's one more for you. The Homebrain uses, according to Marty Burns, an absolute maximum of five watts. At current electric rates, that's a cost of about \$4.00 a year to operate it, day and night.

With a Homebrain, a VIC and conventional devices like switches, thermostats, and motion detectors, it's possible to have computer control over many household functions. As Marty Burns puts it, "All you have to do is *think* of what you want the system to do, and you can make the Homebrain do it." 

VIC-20 OWNERS

We have CHALLENGING GAMES for your continuous enjoyment

A NEW LINE designed for VIC-20

All in at least 50% Machine Code
PRO FOOTBALL (\$19.95) Close to the real thing. 8K expander and joystick required.

COSMIC CRUSADERS (\$14.95) Lone spacecraft monitors space sectors to defend starbases from enemy forces. Joystick.

ULTIMATE TANK (\$16.95) 1 or 2 players battle spiders and giant space eyes. Tank appears stationary while terrain moves for an 'inside the tank' feel. Joystick and Keyboard for No. 2 player.

COSMIC CRYSTALS (\$16.95) 1 or 2 players defend crystals in force field vault in this original high resolution multi-color game. All machine code. Need game paddle.

REBEL DEFENDER (\$19.95) 100% machine code, HI-RES, multi-color graphics, 1 or 2 player game. Paddles required. Rebel forces defend base against imperial stalkers and fighters. 8K expander required.

ASSEMBLER/EDITOR (\$15.95) Use VIC to assemble and edit machine code mnemonics. Uses variable names, labels, calculates branch offsets. Saves program on tape. Prints assembly listings.

* Requires 3K or 8K expander

Dealer Inquiries Invited - Programmers Sought
Check, money order, VISA, MASTERCARD
Prices plus \$1.50 per game for shipping

LITTLE WIZARD DISTRIBUTING

622 North Broadway, #301

Milwaukee, Wisconsin 53202

(414) 273-5460

INTELLIGENT SOFTWARE FOR COMMODORE COMPUTERS

At last, an affordable electronic spreadsheet. **Copycalc** turns your video screen into a window on a matrix of numbers. Cursor around the matrix, enter numbers; the totals reflect the changes. You can save the matrix to disk or tape, or print it on your printer. For \$20 (\$15 with another program), this program can justify the cost of your Commodore. Requires 6k; version available for standard VIC.

Word Processor Plus was not designed to demonstrate what computers are capable of doing, to be an expensive toy, or to instill awe or fear or even admiration into its user; W/P+ was designed solely to facilitate correspondence, for a wide range of personal and business uses, quickly and easily, with a minimum of training and frustration on the part of its user, and at the least possible cost, both in hardware and software. The most thoroughly tested, useable word processor available at anywhere near the price, for all the Commodore computers (R8-232C version available for VIC and 64); \$30 (10k RAM, printer req'd.). Upgrades for old W/P copies (below V4.0) \$15.

Prices include documentation and shipping; Calif. residents add 6%. Please specify hardware configuration when ordering. Other programs available (sorry, no games).

William Robbins, Box 3745, San Rafael, CA 94912

Software and accessories for Commodore's VIC-20™

Examples:

Super Checkbook Balancing \$8.95.

Multiplication Tables, Practice/test \$7.95

Numeric KeyPad, hardware/software \$39.95

Cognitive Psychology Programs (each) \$19.95

(Prices include Postage)

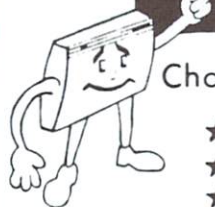
"Quality. Easy-to-use. Low cost."

Send SASE for info on software for the home, school, and psychology laboratory.

Scientific and Educational Software, Inc.
P.O. Box 54
Dayton, Ohio 45420

VIC-20 is a registered trademark of Commodore Business Machines.

EDUCATIONAL SOFTWARE FOR YOUR VIC



Choose From Programs Such As:

- ★ GOTCHA MATH
- ★ ENGLISH INVADERS
- ★ MISSPELL

only \$9.95 Each

► For FREE Program Catalog Call or Write:

COMM*DATA
COMPUTER HOUSE, INC.

P.O. BOX 325
MILFORD, MICHIGAN 48042
(313) 685-0113

We Handle Games For Your VIC, Too!
DRAGONS & TREASURE • VIC TREK
MIRO COMMAND • AND MORE!

PET Educational Software Also Available

VIC-20 EXPANSION CHASSIS

10 DAY
FREE
TRIAL

90 DAY
WARRANTY

PLUG DIRECTLY INTO VIC I



The "PROGRAMMER"®

Plug in up to 3-VIC PACKS, for example:

- a 16K RAM PACK
- a PROGRAMMERS AID PACK
- and a MACHINE LANG. MON.



The AUDIO INTERFACE" \$29

Connect VIC to your HI-FI---for added Depth and Dimension to sound-effects and Music.

PARSEC RESEARCH
VIC-20 is a TM of Commodore

The "GAME MACHINE" \$85

Faster than a Disk Drive! Plug in up to 6 GAME or MEMORY PACKS then Switch Select each... press RESET....



WALA!! New game or memory configuration without turning off VIC or removing PACKS.

Plug in up to 32K RAM and all the other PACKS that Commodore has to offer. Fully Buffered.

ORDER (M.C. & VISA accepted)
C.O.D. or CALL: (415) 651-3160

PARSEC RESEARCH
Drawer 1766 - P
Fremont, CA. 94538

Include: \$2.50 shipping & handling
& 6% tax for CA. res.
(send check or m.o. & we pay ship.)
Dealer inquiries invited.



A VIC Piano

The VIC Sound

Built into its hardware, the VIC has a sound generation system. The output is fed into the audio channel of your TV set, so you can produce realistic effects with a minimum of programming.

Three independent tone generators can be activated and mixed, each with a frequency spectrum of three octaves. Thus, harmony or three-voice music is possible, if you change the frequency of the generators. In addition, the volume may be software controlled. For special sound effects, like explosions and lasers, there is also a "white noise" generator.

To achieve control of the sound capabilities of your VIC, POKE the registers within the VIC chip as follows:


Decimal	Hex	Function
36874	\$900A	Tone generator 1:0 gives no sound. 128 to 255 gives a tone (see below)
36875	\$900B	Tone generator 2
36876	\$900C	Tone generator 3
36877	\$900D	White noise generator. Output varies from an airplane buzz to whistling wind.
36878	\$900E	Volume: 0 gives lowest volume and 15 the highest. Note that the volume control on the TV must also be turned on.

Using the Sound Generator

Though sounds can be generated using simple POKE commands in live mode, the most common method is to use a BASIC program. Notes are read as text strings from data statements, converted to POKE values, and then activated inside FOR...NEXT loops to time the notes correctly. Alternatively, a small program can be written to GET characters from

the keyboard, so the VIC could simulate a simple three-voice electronic organ! As time goes on, our VIC users will undoubtedly build up a massive library of subroutines to generate special effects and games sounds.

Piano Program

To give you an idea of the VIC's sound capabilities, we thought you'd enjoy this simple little piano program. It starts on the note F and runs about an octave and a half up to C#. The "white keys" are "played" on letters A, S, D, F, G, H, J, K, L, :, ;, and =. "Black keys" are played on W, E, R, Y, U, O, P, @ and ↑. It won't turn you into Mozart, but it should give you a good sense of how you can use your VIC for sound. For more detailed information, check the *VIC 20 Programmers Reference Guide*. 

```

10 S2=36874
20 V=36878
30 DIMA(36)
50 FORN=0TO36
60 READA(N)
70 NEXTN
80 GETA$: IFA$="" THEN80
90 IFA$="+" THEN200
100 N=ASC(A$): IFN<58ORN>94 THEN80
110 POKES2,0
120 POKEV,15
130 POKES2,A(N-58)
140 GOTO80
200 POKEV,0
210 END
300 DATA237,239,0,240,0,0,238,209,0,0
310 DATA219,217,223,225,228,0,231,232,235,0
320 DATA0,233,236,0,221,215,0,229,0,212
330 DATA0,227,0,0,0,0,241
READY.

```


Your First Practical Program

by Michael S. Tomczyk

Reprinted from Commodore Magazine, April, 1982

Creating "Practical" Programs

Some people can't cook (like the VIC Magician). But by following a recipe point by point, even the VIC Magician can come up with some tasty concoctions. Programming your VIC 20 is just like cooking—the ingredients in a program can be mixed and matched like a recipe. All you need is a menu of neat little programs you can put together in various ways to create sophisticated practical programs for

home, school or business. This modular approach helps you do complex computing with a minimum of experience and allows you to take advantage of some sophisticated programming techniques, even if you're just a beginner.

One Step at a Time

Writing a practical program is easy. Just take everything one step at a time. You'll find that most practical programs use the 6 steps shown below. There are many other approaches but this should give you a good start. Oh...one caution...don't get bogged down with "cosmetics" like graphics or screen placement. Your first task is to get the program WORKING in terms of instructions, calculations and results. The cosmetics and adjustments are the LAST elements to add to your program. To use our cooking analogy, broil your steak first, then add the seasoning. Here then are 6 elements involved in most practical programs:

VIC MAGICIAN

1. DISPLAY (PRINT) QUESTIONS OR CATEGORIES ON THE SCREEN.
2. CONVERT THE USER'S TYPED-IN RESPONSES TO "INPUT VARIABLES." (In other words we translate what the user types in from the keyboard into

Illustration by Don Dyen

- short string or numeric variables the VIC can understand and work with.)
3. USE THE INPUT VARIABLES TO CALCULATE THE RESULTS YOU WANT TO SHOW.
 4. DISPLAY (PRINT) THE RESULTS OF THE CALCULATIONS, ALONG WITH SOME DESCRIPTIVE WORDS.
 5. REPEAT THE PROGRAM OR END THE PROGRAM.
 6. ADD COSMETICS (to make the program "friendly").

Each program is different, of course, but these are the basic parts of most practical programs. The hard part is putting it all together. Most of us are intimidated by long programs with lots of fancy commands and mysterious variables, but those programs didn't start out to be that long or fancy. They started very simply and grew as the programmer kept adding elements to make the program more powerful or "friendly."

Plan Your Program Carefully

So you're ready to write your practical program. The first thing to do is make a CHECKLIST of what you want your program to accomplish. Try to write it in chronological order. If it's a long list, break the elements down into the simplest steps and build the program slowly, starting with the program's LOGIC. Here's an example of the checklist used for an INCOME/EXPENSE program described in detail below:

1. NAME OF PROGRAM: INCOME/EXPENSE BUDGET
2. CLEAR SCREEN
3. ENTER TOTAL INCOME
4. ENTER EXPENSE CATEGORY (3 ITEMS)
5. ENTER EXPENSE AMOUNT
6. ADD TOTAL EXPENSES
($E1 + E2 + E3 = \text{EXPENSES}$)
7. COMPUTE NET INCOME (INCOME - TOTAL EXPENSES = BALANCE)
8. FIGURE PERCENT OF TOTAL EXPENSES FOR EACH CATEGORY ($E1/E = \%$)
9. EXPENSES = WHAT PERCENT OF INCOME?
($\text{EXPENSES}/\text{INCOME} = \%$)
10. INCLUDE ROUNDING FUNCTION TO ROUND ALL NUMBERS TO 2 DECIMAL PLACES (CENTS) (POSSIBLE DEF FN).

From here, you can either do a more detailed programming flowchart using standard flowcharting symbols and notation, or you can simply make programming notes next to your original checklist, as shown above in parentheses.

Some Practical Programming Tips

Before we get into our program example, let's go through some fairly standard practical programming tips, with some shorter examples to show you how various techniques work.

CLEAR THE SCREEN

The first line in most practical programs is a clear screen command. Clearing the screen is covered in the VIC 20 user's guide, but here's a quick refresher. Normally, you CLEAR the screen by holding down the SHIFT key and hitting the CLR/HOME key. In your program, you will simply add an opening line number and PRINT the CLEAR command, like this:

```
10 PRINT "␣" (Type SHIFT CLR/HOME
               here...the reverse heart
               symbol appears whenever
               you CLEAR the screen
               inside quotation marks)
```

The CLEAR command doesn't have to be on a separate line. You can include it in your first PRINT statement, if you like, for example:

```
10 PRINT "␣ MONTHLY INCOME"
```

USE PRINT STATEMENT TO PROMPT (INSTRUCT) USER

A "prompt" can be a question, word, phrase, number, instruction or category. It simply helps the user type in the right information. Here's an example of a PRINT statement that "prompts" the user to type in his monthly income:

```
10 PRINT "MONTHLY INCOME:"
```

USE INPUT & VARIABLES TO ACCEPT USER INFORMATION

An INPUT statement automatically places a question mark (?) on the next line after the prompt you PRINTed, and causes the VIC 20 to wait patiently until the user types in a response to the prompt. Here's an example of an INPUT statement:

YOU TYPE THIS:	VIC SCREEN SHOWS THIS:	
10 PRINT "MONTHLY INCOME:"	MONTHLY INCOME:	VIC displays this and "waits"
INCOME:"	?	
20 INPUT M		
30 PRINT "YOUR INCOME IS" M	1000 INCOME	← You enter this
(type RUN & hit RETURN)	YOUR INCOME IS 1000	(VIC responds)

What we did here was first PRINT the prompt message... then we told the VIC to wait for an INPUT (response) to be typed from the keyboard, and assigned the variable name M to the value representing monthly income. The PRINT message in line 30 simply proves that the VIC accepted this information.

INPUTs can and usually are on the SAME LINE as the PRINT statement. You can save memory space and increase your program efficiency by combining the PRINT and INPUT statements on one line. Be sure to separate both commands with a colon (:) as shown:

```
10 PRINT "MONTHLY INCOME":INPUT M
```

You can also combine several INPUTs on one line. For example:

```
10 PRINT "ENTER 3
NUMBERS":INPUTA:INPUTB:INPUTC
20 PRINT A:B:C
```


VICtip for First-Time Computer Owners

TO ENTER A PROGRAM LINE INTO THE VIC 20—just type the line number, the program commands or statements, and hit the RETURN key.

TO SEE THE PROGRAM LINE(S) OPERATE—type the word "RUN" and hit RETURN.

TO SEE YOUR PROGRAM DISPLAYED LINE-BY-LINE—for editing purposes, type the word "LIST" and hit the RETURN key.

TO CHANGE A PROGRAM LINE—either use the CURSOR keys to move to the line and change it, then hit RETURN, or retype the line number and hit RETURN (the new line with the same number will replace the old one with that number).

TO DELETE A PROGRAM LINE—simply type the line number of the line you want to delete and hit RETURN (to delete line 10 just type the number 10 and hit RETURN).

How Variables Work With INPUT Statements

Variables allow the VIC to accept information typed in by the user and then use that information in the program! Variables are in fact the key to interactive programming (this series places a lot of emphasis on variables because they're so important...your ability to program increases greatly if you understand how variables work).

You can think of a variable as a "storage compartment" where the VIC stores the user's response to your prompt question. For example, you can write a program that asks the user to type in his name. In this case, you might assign the variable **NS** to the name typed in. Now every time you PRINT **NS** in your program, the VIC will automatically PRINT the name the user typed-in! Type the word NEW, hit RETURN, and try this example:

```
10 PRINT "YOUR NAME":INPUT NS
20 PRINT "HELLO,"NS
```

You might have noticed that we used variables like A,B,C and M to represent numbers in earlier examples, but here we use the variable **NS** to represent a name. We used **N** to remind ourselves that this variable stands for "NAME" and we used a dollar sign to signify a string variable. This is important because variables come in two flavors: numeric variables and string variables.

NUMERIC VARIABLES are used to store number values such as 1, 100, 4000, etc. A numeric variable can be a single letter (A), any two letters (AB), a letter and a number (A1), or two letters and a number (AB1). You can save a little memory by using shorter variables but letters and numbers (A1, A2, A3) are often best if working with different categories in the same program. There is also a special type of numeric variable called an integer variable which eliminates decimal places from your numbers (helpful if you want calculations represented as

whole numbers instead of numbers with long decimals). To get integer (whole) numbers, simply put a percent (%) sign at the end of your variable name (i.e., A1% or AB%) which makes the VIC treat all numbers typed in as whole numbers only, dropping any decimal places. Note that the percent sign here doesn't mean you are calculating real percentages. It's simply a symbol used with integer type variables.

STRING VARIABLES look just like numeric variables except they end with a dollar sign (\$) like AS or A1\$. String variables are used to store words, phrases, sentences, graphic symbols and "numbers which are used like words."

By "numbers used like words" we mean numbers that will not be used in a calculation. Your social security number is an example of a number that is identified with a string variable instead of a numeric variable, because your SSN is used like a "label" instead of a "value."

Another good example is your **age**. If you ask the user to type his age for "reference" in a program, you might use a string variable because you will not be doing any calculation using his age...BUT...if you plan to calculate his date of birth by subtracting his age from this year, you are using age as a **number value** and must use a numeric variable. String variables take the same form as numeric variables, except they are followed by the **S-shaped dollar sign** (\$). Examples of string variables are: AS, ABS, A1\$, AB2\$, and so on. Here are some examples:

Example 1

```
10 PRINT "ENTER A NUMBER":INPUT A
20 PRINT A
```

Example 2

```
10 PRINT "ENTER A WORD":INPUT AS
20 PRINT AS
```

Example 3

```
10 PRINT "ENTER A NUMBER":INPUT A
20 PRINT A "TIMES 5 EQUALS" A * 5
```

Note in Example 3 that the MESSAGES or PROMPTS are INSIDE the quotation marks, while the variables are OUTSIDE. In line 20, you PRINTED A (the number you entered when prompted), then the message "TIMES 5 EQUALS," and then a CALCULATION (multiply the number A*5).

Calculations Make Practical Programs "Practical"

Calculations are important in most programs, from games to business aids. You have a choice of using either actual numbers or variables, when doing calculations inside a program, but if you're working with numbers supplied by the user you must use numeric variables. Begin by asking the user to type in two numbers, like this:

```
10 PRINT "TYPE 2 NUMBERS":INPUT A:INPUT B
```

Now multiply those numbers together to create a new variable C (C is number A

INCOME/EXPENSE BUDGET EXAMPLE

```

5 PRINT " " (clears the screen)
10 PRINT "MONTHLY INCOME":INPUT IN (PRINT/INPUT statement)
20 PRINT (Inserts blank line)
30 PRINT "EXPENSE CATEGORY 1":INPUT E1$ (Expense Cat 1=E1$)
40 PRINT "EXPENSE AMOUNT":INPUT E1 (Expense Amt = E1)
50 PRINT (Blank line)
60 PRINT "EXPENSE CATEGORY 2":INPUT E2$ (Expense Cat 2 = E2$)
70 PRINT "EXPENSE AMOUNT":INPUT E2 (Expense Amt 2 = E2)
80 PRINT (Blank line)
90 PRINT "EXPENSE CATEGORY 3":INPUT E3$ (Expense Cat 3 = E3$)
100 PRINT "EXPENSE AMOUNT":INPUT E3 (Expense Amt 3 = E3)
110 PRINT " " (clear screen)
120 E=E1+E2+E3 (Add Expense Amts = E)
130 EP=E/IN (Calculate Expense/Income%)
140 PRINT "MONTHLY INCOME: $"IN (Display Income)
150 PRINT "TOTAL EXPENSES: $"E (Display Total Expenses)
160 PRINT "BALANCE EQUALS: $"IN-E (Display Income-Expenses)
170 PRINT (Blank line)
180 PRINTE1$="(E1/E)*100"% OF TOTAL EXPENSES" (Lines 180-200 calculate
190 PRINTE2$="(E2/E)*100"% OF TOTAL EXPENSES" % each expense amount is
200 PRINTE3$="(E3/E)*100"% OF TOTAL EXPENSES" of total expenses)
210 PRINT (Blank line)
220 PRINT "YOUR EXPENSES="EP*100"% OF YOUR TOTAL INCOME" (Display E/1%)
230 FOR X=1 TO 5000:NEXT:PRINT (Time Delay Loop)
240 PRINT "REPEAT? (Y OR N)":INPUT Y$:IFY$="Y" THEN 5:IFY$="N" THEN GO TO 250
250 PRINT " " ".END

```

Adding Sound Effects

To use a sound effect, it's usually a good idea to include this line at the beginning of your program (it would normally start at line 10 as the first program line but we're using line 2 to add it to the beginning of our program above):

```

2 POKE36878,15:S1=36874:S2=36875:
S3=36876:S4=36877

```

Now you can use any of the VIC's four

speakers by referring to S1, S2, S3 and S4. S1 is the deepest (lowest) voice and S3 is the highest (soprano). S4 is used for "white noise sound effects." Here is a sound effect you can add to your program above. Simply insert this line wherever you want a "beep" in your program (for example at Line 35):

```

35 POKES3,200:FORT=1 TO 200:NEXT=
POKES3,0

```



MAILING LIST and LABELS

TOTL LABEL 2.0
(VIC and 64)
Easy Editing
User defines label size
Automatically sorted
Optional non-printing data lines
Browse through list
Select labels for printing
\$20.00

WORD PROCESSING

TOTL TEXT 2.0 (VIC only)
Full capability word processing
Margin and spacing control
Centered title lines. Indentation and tabs. Upper and lower case and graphics. Full screen editing. Scrolling up and down
No limit to document length
\$25.00

TOTL TEXT 2.5 (VIC)
TOTL TEXT 2.6 (64)
All TOTL TEXT 2.0 features plus:
Heading lines (up to 4)
Footnote line and footnotes
Keyboard input
Right margin justification
Print from memory or device (2.6 only)
\$35.00

TIME MANAGEMENT—SCHEDULING, REMINDERS

TOTL TIME MANAGER 2.0
(VIC and 64)
Enter and edit activities
Uses dates and times
Inquiry by date, person, project
Bar chart reports from 2 days (24 hours) to 4 years
Print reports by activity, person or project
Reports may also be sorted by dates
56 possible report formats
\$25.00

KEY WORD CROSS REFERENCE

RESEARCH ASSISTANT 2.0
(VIC and 64)
Great for students and authors
Compile reference notes
Save bibliographic data
Quick cross reference by keyword
Print data and cross reference lists
Edit reference data (with disk only)
\$25.00



SOFTWARE for VIC 20* and COMMODORE 64*
QUALITY at a price that's music to your ears!

TOTL
software

SHIPPING INCLUDED.
California Residents add 6% Sales Tax.
\$3.00 charge for C.O.D.

Send check or money order to:

TOTL Software
P.O. Box 4742
Walnut Creek, CA 94596



Call (415) 943-7877

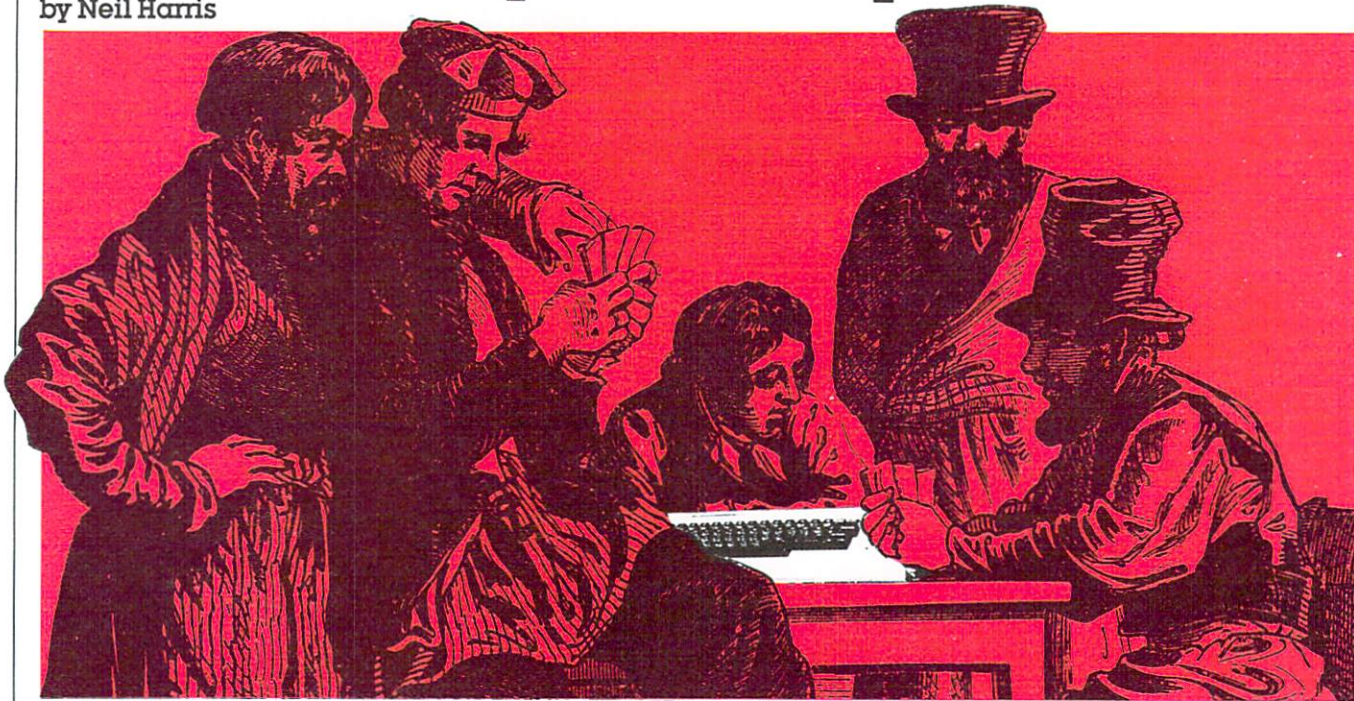
SPECIAL VERSIONS AVAILABLE FOR
QUANTUM DATA INC. 40/80 COLUMN
VIDEO BOARD

Designed for tape and/or disk input/output.
VIC programs require 8K expansion.
Will run with VIC or RS-232 printers.
Specify machine when ordering.
All programs shipped on cassette tape.
DEALER INQUIRIES WELCOME.

*VIC 20 and COMMODORE 64 are trademarks of Commodore Business Machines.

The Great Computer Rivalry

by Neil Harris



This age of high technology sure has complicated life. Oh, I know that computers make many things easier, from sending out phone bills to word processing to playing games. But getting together with my friends has turned into a battle.

You see, each of us owns a different brand of home computer. Now we spend more time debating the merits of our different systems than playing poker.

A couple of years ago, each of us settled on a brand we liked to work with. My choice was Commodore, and the first computer I used was the PET 2001. Others in the game got themselves computers named after fruit, or from the state that made Chainsaw Massacres famous, or from the makers of Pong, or one that became nicknamed Trash-80, or a little bitty one from a watch company.

In those days, we were more friendly about our rivalries. We were all pioneers, without much software and hardware support, without good documentation. It was possible then to spend our poker games enlightening each other. We shared BASIC tricks, and complained about the parts we lacked.

In the last year or two, the rivalry has escalated.

The first problem was with the marketing direction taken by the manufacturers of our machines. The Fruit computer company decided that business systems were where their future was. They developed more expensive equipment, which didn't work too well at first. My buddy with the Fruit computer became a vicious poker player, because he now needed the money to support his computer system. His machine plays great games, but for the money he's invested he could own an arcade by now.

The Chainsaw Massacre company shocked the owner of that machine by dropping the

price from about \$1000 to \$200. Just when we stopped chiding him for buying just before the price drop, they announced their line of accessories. Boy, what they charge for extra memory! My friend is afraid to make a move. He thinks that, as soon as the company gets word that he plunked down his cash, they'll cut the price by 80% on that, too. He needs the extra memory to do almost anything, but he won't be able to face us if the worst happens.

The guy with the grown-up Pong machine takes a lot of abuse over his computer. It's the one with the flat plastic keyboard, like the cash register in McDonald's. If we're around when he's programming, all he hears is "Big Mac, fries, large coke!" He once asked me how much I paid for BASIC in my machine. I was incredulous: "You mean BASIC costs extra?"

Then there's my friend the Trashman. He bought his Model I back in the old days, even though we warned him. "You wouldn't buy a stereo from them, right?" When he wanted to expand the memory, he had to take his machine to the service center and leave it with them. Nobody else makes you do all that. His other problem is software; he can get OK software for business, but the games are lousy. He got the computer that works in color, but the calculator-style keyboard drives him crazy, and he can't even get good games for that.

The guy with the watch computer has trouble even talking to the rest of us. His hands look arthritic from trying to use the tiny keyboard. He does have BASIC commands right on the keyboard, but he usually just types the whole word rather than searching for a command. One day we discovered that you could see right through his machine when you hold it up to the light! And when he tries to play games, in black & white with no sound, the rest of us just shake

our heads with sympathy. Some day he'll probably get a grown-up computer.

In the old days, I took my share of abuse over a small keyboard, over manuals that came out late. But lately my friends look at me differently. Each Commodore machine does something different, and does its job as well as you could hope. My CBM wordprocessor makes my Fruit computer friend turn as green as my CRT with envy. My VIC 20's games and BASIC frustrate the Chainsaw Massacre and Trash computer owners, who haven't got anything that compares to the games. And the guy with the Pong computer keeps talking about these two great games, Mac Pan and Star Riders (or something like that), but when we ask if any other games are any good, he just looks glum.

When I bought my VICMODEM, all my friends stopped talking to me for a while. It takes about \$400 to run a modem on their machines, when you count interfaces and software that you need to make it work. My modem was only \$109.95, including all that. In fact, for the price of their modems, they could get a VIC, tape deck, and a modem. A couple guys have held off on getting modems, and I think they're considering getting VICs just for that.

Finally, my friends decided to subject me to an inquisition. There must be, they thought, some weakness in my system.

"What's the BASIC like?" they asked.

"The same as in my PET. MicroSoft high level BASIC."

"Well," said the Chainsaw Massacre computer owner. "Mine has ANSI standard BASIC."

I didn't have to say anything, the Fruit owner hit him in the head. "Don't you know anything? ANSI standard defines *minimal* BASIC. MicroSoft

can run rings around it."

"Oh. What about a disk drive?"

"I can get a VIC drive for \$399."

"Mine is also \$399," he said. "What about your disk controller?"

"It's built in."

"It is? But I have to pay \$299 extra."

The Pong computer owner jumped in.

"What's the capacity of the drive?"

"174,000 bytes."

He turned pale. His only has 88,000, and it uses so much of the computer's RAM that he had to void his warranty by purchasing a third party's memory to use it. I knew that my VIC drive holds more than any of them, even the expensive Fruit computer with only 143,000 bytes.

"How many dimensions per array?"

"As many as I need. How about you?"

Chainsaw and Pong got real quiet about this.

"Two," said Pong.

"Three," said Chainsaw Massacre.

"Tsk, tsk," I said.

"How about music?" asked the Trashman.

"3-part harmony plus white noise," I said.

"And wait until I bring in the new Commodore 64. It has a synthesizer on one chip, built-in."

The Fruit computer owner looked ill now. Last year he got a special synthesizer system for his computer that set him back over \$600. The 64 costs that much for the whole computer system.

"I have some questions for you, wise guys," I said. "How about upper and lower case letters? Keyboard graphics? Color controls?"

"Nobody likes a know-it-all", they said.

It's not my fault. I just took a careful look at what was available, and made the right choice. ⚡

MIS VIC-20 SOFTWARE

**TWO NEW ARCADE GAMES!
100% MACHINE 100% FAST**

You were on a routine patrol through an uncharted asteroid belt when you were caught in a . . .

GALACTIC CROSSFIRE Will you survive?

• **GALACTIC CROSSFIRE** is a multi-color hi-res arcade game that runs on the unexpanded VIC-20. JOYSTICK REQUIRED.

• **ALIEN SOCCER** is a multi-color hi-res arcade game that runs on the unexpanded VIC-20 using JOYSTICK, KEYBOARD, or PADDOLES.

GALACTIC CROSSFIRE and **ALIEN SOCCER** are available on cassette with complete documentation, enclosed in an attractive vinyl binder for \$14.95 each.

MIS produces the finest educational, recreational, and functional software available for the Commodore VIC-20 Personal Computer. Ask for MIS software at your local computer store or order direct from MIS. VISA, MASTERCARD, phone orders, and C.O.D. accepted. California residents add sales tax.

ALIEN SOCCER



MIS

250 Fern Rock Way
Boulder Creek, CA 95006
(408) 338-9546

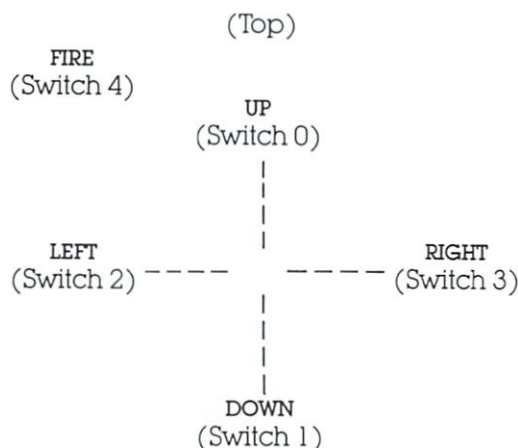
Once again programmer Bill Hindorff came through—this time with an excerpt from the forthcoming Commodore 64 Programmers Reference Guide. (Yes, all 300-or-so pages of it.) This particular chapter should be of interest to all our game fanatics, who can now go bonkers with those terrific high-res graphics on the 64.

Joysticks, Paddles, and Light-Pen

The Commodore 64 has two 9 pin Game Ports which allow the use of joysticks, paddles, or a light pen. Each port will accept either one joystick or one paddle. A light pen can be plugged into Port A for special graphic control, etc. . . Examples of using the joysticks and paddles from BASIC and machine language follow.

The digital joystick is connected to CIA #1 (MOS 6526 Complex Interface Adapter). This I/O device also handles paddle fire buttons and keyboard scanning. The 6526 has 16 registers which occupy memory locations 56320 thru 56335 inclusive (\$DC00 to \$DC0F). Port A data appears at location 56320 (\$DC00) and Port B data is at location 56321 (\$DC01).

A digital joystick is made up of five switches, four for direction and one for the fire button. The joystick switches are arranged as shown:



These switches correspond to the lower 5 bits of the data in location 56320 or 56321. Normally the bit is set to a one if a direction is NOT chosen or the fire button is NOT pressed. When the fire button is pressed, the bit changes to a zero (bit 4 in this case). To read the joystick from BASIC, the following subroutine may be used:

```
10 FORK=0TO10:REM SET UP DIRECTION STRING
20 READ DIR$(K):NEXT K
30 DATA "N","S","E","W","NW","NE","SE","SW"
40 DATA "FIRE"
50 PRINT "GOING..."
60 GOSUB 100:REM READ THE JOYSTICK
65 IF DIR$(JV)="" THEN 80:REM CHECK IF A DIRECTION WAS CHOSEN
70 PRINT DIR$(JV):" ":REM OUTPUT WHICH DIRECTION
80 IF DIR$(JV)="" THEN 60:REM CHECK IF FIRE BUTTON WAS PUSHED
90 PRINT "FIRE"
100 JV=PEEK(56320):REM GET JOYSTICK VALUE
110 FR=JVAND16:REM FORM FIRE BUTTON STATUS
120 JV=15-(JVAND16):REM FORM DIRECTION VALUE
130 RETURN
READY.
```

The values for JV correspond to these directions:

JV EQUAL TO	DIRECTION
0	NONE
1	UP
2	DOWN
3	—
4	LEFT
5	UP & LEFT
6	DOWN & LEFT
7	—
8	RIGHT
9	UP & RIGHT
10	DOWN & RIGHT

A small machine code routine which will accomplish the same task is as follows:

```
1000 .PAGE (JOYSTICK,8/5) JOYSTICK - BUTTON READ ROUTINE
1010 ;
1020 ;AUTHOR - BILL HINDORFF
1030 ;
1040 DX=#C110
1050 DY=#C111
1060 *=#C200
1070 DJRR LDX #0 ;THIS ROUTINE READS AND DECODES THE
1080 LDY #0 ;JOYSTICK/FIREBUTTON INPUT DATA IN
1090 LDA #DC00 ;GET READING FROM PORT A
1100 LSR A ;THE ACCUMULATOR, THIS LEAST
SIGNIFICANT
1110 BCS DJR0 ;5 BITS CONTAIN THE SWITCH CLOSURE
1120 DEY ;INFORMATION, IF A SWITCH IS CLOSED IT
1130 DJR0 LSR A ;PRODUCES A ZERO BIT, IF A SWITCH
IS OPEN
1140 BCS DJR1 ;IT PRODUCES A ONE BIT, THE JOYSTICK
DIR-
1150 INY ;CTIONS ARE RIGHT, LEFT, FORWARD,
BACKWARD
1160 DJR1 LSR A ;BIT3=RIGHT, BIT2=LEFT, BIT1=BACKWARD,
1170 BCS DJR2 ;BIT0=FORWARD AND BIT4=FIRE BUTTON.
1180 DEY ;AT RTS, DX AND DY CONTAIN 2'S
COMPLEMENT
1190 DJR2 LSR A ;DIRECTION NUMBERS I.E. #FF=-1, #00=0,
#01=1.
1200 BCS DJR3 ;DX=-1 (MOVE RIGHT), DX=1 (MOVE LEFT),
1210 INY ;DY=0 (NO Y CHANGE), DY=-1 (MOVE
UP SCREEN),
1220 DJR3 LSR A ;DY=1 (MOVE DOWN SCREEN), DY=0
(NO Y CHANGE).
1230 STX DX ;THE FORWARD JOYSTICK POSITION
CORRESPONDS
1240 STY DY ;TO MOVE UP THE SCREEN AND THE BACKWARD
1250 RTS ;POSITION TO MOVE DOWN SCREEN.
1260 ;
1270 ;AT RTS TIME THE CARRY FLAG CONTAINS THE FIRE
BUTTON STATE.
1280 ;IF C=1 THEN BUTTON NOT PRESSED, IF C=0 THEN PRESSED.
1290 ;
1300 .END
READY.
```

Paddles

A paddle is connected to both CIA #1 and the SID chip (MOS 6581 Sound Interface Device) through a game port. The paddle value is read via the SID registers \$D419 and \$D41A. PADDLES CANNOT BE READ RELIABLY FROM BASIC ALONE!!!! The best way to use paddles, from BASIC or machine code, is to use the following

(continued on page 49)



NEW VIC SOFTWARE VIC



COMPUTERMAT • BOX 1664, DEPT PP
LAKE HAVASU CITY, ARIZONA 86403

(602) 855-3357

WRITE FOR FREE CATALOG OF VIC SOFTWARE

ADVENTURE PAK

By Mark William

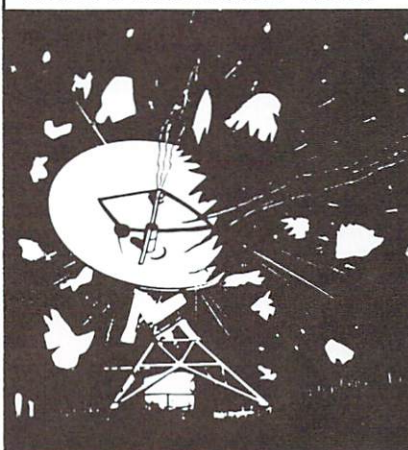


VIC-20
In Text

ADVENTURE PAK
2 Adventures Included

ADVENTURE — REQUIRES 8K OR 16K MEMORY CARTRIDGE
CAVES OF SILVER — REQUIRES 8K OR 16K MEMORY CARTRIDGE

RUNS IN STANDARD VIC-20



TARGET
COMMAND

By Cliff Dudzik

Color
Graphics
Sound

JOYSTICK
OR
KEYBOARD



SOFTWARE FROM
COMPUTERMAT
WILL TURN YOUR
VIC-PET-CBM INTO A
HOME ARCADE!

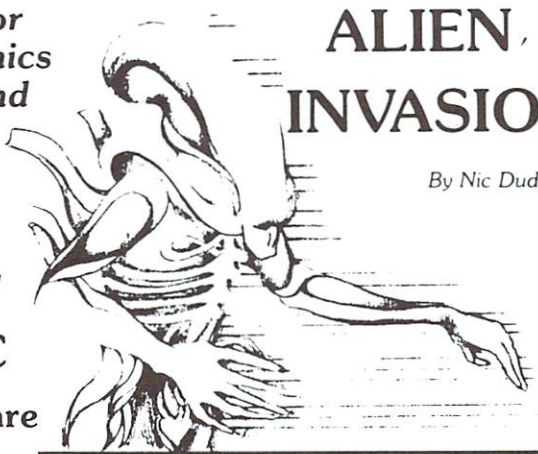
WARNING — BUYERS OF THESE GAMES HAVE BEEN KNOWN TO BECOME ADDICTS

Color
Graphics
Sound

ALIEN INVASION

By Nic Dudzik

New
VIC
Software



RUNS IN STANDARD VIC-20

SNAKEOUT

By Cliff Dudzik

Color
Graphics
Sound

New
VIC
Software



RUNS IN STANDARD VIC-20 JOYSTICK OR KEYBOARD

GREAT VIC SOFTWARE

All VIC Programs Run in Standard VIC Unless Noted

ADD \$1.00 FOR SHIPPING AND HANDLING

\$12.95 Each

WE WELCOME YOUR PERSONAL CHECK

COUPON CONTROL:

A Low-Cost Coupon Inventory Program for the VIC 20

by Doug Holub

My wife collects coupons. She's got over a hundred coupons for discounts on groceries, fast-food, car washes, you name it. I'll admit it's a little annoying to find rectangular holes cut out of the newspaper, and sometimes looking for the rest of a magazine article in the coupon file makes me mutter under my breath, but otherwise it's a perfectly harmless activity and potentially profitable.

Saving coupons is an effective way to keep the grocery bill down every week, but very often the amount of time and trouble required to keep track of a lot of coupons makes the savings look less attractive. Think about it: to make sure she uses the coupons she saves a housewife

needs to read through her stack of coupons every week to remind herself what coupons she has. She also needs to keep track of expiration dates. The print on coupons is notoriously tiny and a person has to hunt for the expiration dates. Each coupon is handled many times before it is redeemed.

I saw the idea for a coupon inventory program in a computer magazine but that program required a disc drive and 32K and I really didn't think I could justify spending \$500.00 to upgrade my system to fit the program. So, I wrote one for the set-up I had—a VIC 20 with 13K and a cassette recorder. I'm very pleased with it (and I'm prejudiced).

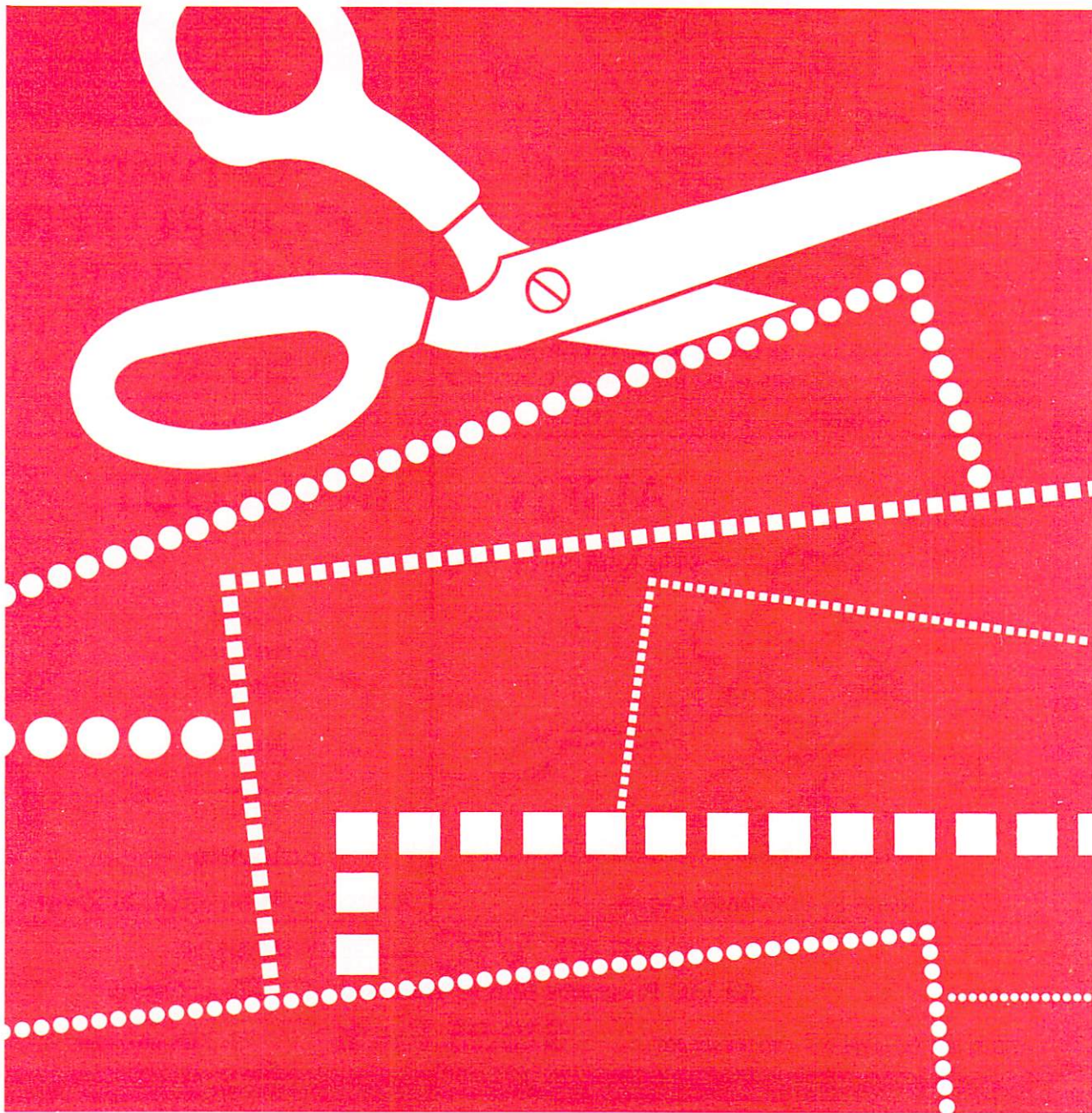


Illustration by Jacob Gernsheimer

Most database management programs store and retrieve information from a random access file on disc. In a matter of seconds the computer can read all the information on file and manipulate the data. (Technology is wonderful! It's a great day we're living in!) Storing and retrieving information with a cassette tape player goes much slower. It would take the computer about two minutes to read through my wife's 150 coupons if they were filed on cassette tape, and that's just one pass! If I decided I wanted the computer to search for another coupon after it just got done looking for some, I would have to rewind the tape and wait another two minutes. I think I could do it faster with my fingers and a file box!

For that reason I stored coupon information in DATA statements at the end of the program. The advantage is that now the computer can manipulate data as fast as it could with a disc drive. The disadvantage is that the program needs to be SAVED after each coupon searching session.

One interesting aspect of this program is the way the computer writes its own DATA statement program lines. The user never needs to LIST the program to add or delete DATA statements. Here's how the system works:

Whenever a housewife runs across a coupon during the week she cuts it out and puts it in the unclassified section of her coupon file box. Then once a week (more or less) she sits down at the computer terminal with all her unclassified coupons, LOADs the program, and types RUN. She sees

COUPON CONTROL

ADD A COUPON OR
LOOK FOR A COUPON?

She wants to add coupons to her file so she hits "A" for "add." Then she sees

COUPON CONTROL

BAKING	FAST FOOD
BEAUTY	FROZEN
BOXED FOOD	FUN
BREAD	HYGIENE
CANDY	MEAT
CANS	MEDICINE
CEREAL	PAPER-ETC.
CLEANING	SAUCE
DAIRY	SNACK
DRINK	MISC.

CATEGORY?
ITEM?
CENTS OFF?
EXPIRATION?

There are five pieces of information attached to each coupon filed in the computer:

category, item, cents off, expiration date, and a coupon number. First the coupon is assigned to one of the twenty categories listed on the screen. For example, a 20¢-off coupon for Doritos would be assigned to the SNACK category. Next the computer asks "ITEM?" It's asking for the product's name or a description of it, i.e., "Doritos" or "taco corn chips". The expiration date is entered as a six-digit number. The first two digits represent the year, the next two the month, and the last two the day of the month. "October 31, 1983" would be written "831031". The computer assigns coupon numbers according to what category the coupon is in. All baking coupons are assigned numbers from 1200 to 1249; beauty coupons get 1250 to 1299; boxed food gets 1300 to 1349; etc.

Now comes the interesting part. This is what the screen displays next:

THE FIRST NUMBER IN THE
COMPUTER ENTRY BELOW IS
THE COUPON NUMBER.

WRITE IT ON THE COUPON
AND FILE IT.

THEN HIT 'RETURN'.

2142 DATA SNACK, DORITOS,,20,831031,2142

At this point the program is over and the VIC 20 is in edit mode. The cursor is positioned right on the coupon DATA statement line. When the user hits 'RETURN' the computer thinks she has just written a program line and entered it. Pretty slick, isn't it? To enter another coupon she types 'RUN' and repeats the process. (Are you wondering why the coupon number is the same as the program line number? Stay tuned.)

Now let's say it's Saturday morning and Mrs. Smith is about to do her weekly grocery shopping. She wants to check her coupon file against her shopping list to see if there are any coupons she can use, so she heads for the computer. The key to making this coupon inventory program a time saving tool is to not watch the computer as it LOADs and SAVEs the program. When someone makes a pot of coffee he doesn't watch it perk. When my wife does a load of wash she doesn't stare at the machine while it's washing the clothes. So Mrs. Smith has allowed herself about ten minutes to check her coupon file before she's ready to leave for the store. She turns on the computer, puts the cassette in the tape player, types 'LOAD', and hits 'RETURN'. Then she goes and looks for her car keys, or puts on some make-up, or rounds up the kids, or eats a donut. In a few minutes she's back at the computer and types 'RUN'. She sees

COUPON CONTROL

ADD A COUPON OR
LOOK FOR A COUPON?

Since she wants to look for coupons she hits "L" for "look". Now the screen shows

COUPON CONTROL
TODAY'S DATE?

and Mrs. Smith enters a six-digit number for the date. Then she sees

COUPON CONTROL

BAKING	FAST FOOD
BEAUTY	FROZEN
BOXED FOOD	FUN
BREAD	HYGIENE
CANDY	MEAT
CANS	MEDICINE
CEREAL	PAPER-ETC.
CLEANING	SAUCE
DAIRY	SNACK
DRINK	MISC.

CATEGORY OR ITEM?

The program can search for coupons by category or by item. She types "C" for "category" and then the computer asks "WHAT CATEGORY?" When she enters "CLEANING" the screen begins to print stuff like —

IVORY	.20	1551
JOY	.15	1552
MR. CLEAN	.30	1554
EXPIRED		
STAIN SPRAY	.25	1555

As the computer locates coupons in its memory it compares the expiration date in the DATA statement with the date entered at the start of the program. If the date in the DATA statement is less than the one entered by the user the computer prints "EXPIRED" under the coupon listing.

If Mrs. Smith sees a coupon she wants or one that is expired she jots down the number. When the computer is through listing all the coupons for a particular category it will ask again "CATEGORY OR ITEM?" and the user can continue searching for coupons by category or item name for as long as necessary. If the user wants to stop looking for coupons she hits "S" for "stop" and the computer prints:

IF YOU ARE GOING TO USE
ANY COUPONS, OR IF ANY
COUPON HAS EXPIRED,
TYPE ITS NUMBER AND HIT
'RETURN'.

(DON'T FORGET TO 'SAVE'
THE PROGRAM WHEN YOU'RE
DONE.)

Now the program is over and maybe you've figured out why the coupon number is the same as the line number of the DATA statement in the program. When the user types the coupon number and hits 'RETURN' he is actually writing a new line for the program, a line with nothing on it that replaces the DATA statement of the coupon that has been used or has expired. The coupon is now removed from the computer file.

Mrs. Smith found out everything she wanted to know so she types 'SAVE' and hit 'RETURN'. The list of numbers she has takes her directly to the coupons she wants in her file box. While the program is SAVING she goes and gets another donut.

If you don't have a disc drive for your personal computer and you want an easy-to-use coupon inventory program, here you go. If you don't feel like typing all of it into your computer, send me \$3.00 and I'll send you the program on cassette.

PROGRAM REMARKS FOR "COUPON CONTROL"

Line #	
35	During the search loop this statement resets the "NONE" flag to 0.
86	This is the "NONE" flag. If a coupon has been located it keeps the computer from printing "NONE".
780	:FI=1 This raises a flag that prevents the user from entering a category name which is misspelled or which is not one of the categories that the computer recognizes.
796-834	These statements begin the subroutine that assigns coupon numbers according to category.
880	The computer spins in mini-loop here until it READS the DATA statement line number assigned to the category it's looking for.
890-930	Now the computer looks for a gap in the consecutive coupon numbers. For example, if coupons in BAKING had numbers 1201, 1202, 1203, 1205 the next number to be assigned to a coupon in the BAKING category would be 1204.
1200,1250	
1300,1350	
...2150	These "dummy" DATA statements insure that the category-coupon-number markers don't get used. If actual coupons occupied these line numbers, the special category line numbers would be erased from the program when the coupon was removed from the file.

Coupon Control/Requires 8K Expander

```

READY.
5 PRINT "J":PRINT "COUPON CONTROL"
6 PRINT "
7 PRINT "ADD A COUPON OR LOOK FOR A COUPON?"
8 INPUT AL#
9 IF AL#="A" THEN 720
13 PRINT "J":PRINT "COUPON CONTROL"
14 PRINT "
15 PRINT "TODAY'S DATE":INPUT DA
16 GOSUB 1016
30 PRINT "CATEGORY OR ITEM NAME"
31 INPUT CI# IF CI#="I" THEN 132
32 IF CI#="S" THEN 129
33 GOSUB 1016
35 Q=0
38 PRINT "WHAT CATEGORY?" :PRINT
50 INPUT L#
60 READ D#,E#,F#,G,H,X
62 IF D#="QUIT" THEN 95
66 IF D#="L" THEN Q=1
67 IF D#="L" THEN PRINT:PRINT E#,F#,TAB(15)H%
68 IF D#="L" AND GCD# THEN PRINT "EXPIRED"
90 GOTO 80
95 IF Q=0 THEN PRINT "NONE"
100 RESTORE:PRINT GOTO 30
129 PRINT "IF YOU'RE GOING TO USE ANY COUPONS,
OR IF ANY COUPON HAS EXPIRED,"
130 PRINT "TYPE ITS NUMBER AND HIT RETURN."
131 PRINT "PRINT:PRINT" (DON'T FORGET TO SAVE THE PROGRAM
WHEN YOU ARE DONE.) :END
132 INPUT "WHAT ITEM":L#
133 Q=0:PRINT
160 READ D#,E#,F#,G,H,X
162 IF D#="QUIT" THEN 170
164 IF D#="L" THEN Q=1
165 IF D#="L" THEN PRINT:PRINT E#,F#,TAB(15)H%
166 IF D#="L" AND GCD# THEN PRINT "EXPIRED"
169 GOTO 160
170 IF Q=0 THEN PRINT "NONE"
171 RESTORE:PRINT GOTO 30
720 GOSUB 1016
780 INPUT "CATEGORY":C# FI=1
795 IF C#="BAKING" THEN FI=1200
798 IF C#="BEAUTY" THEN FI=1250
800 IF C#="BOXED FOOD" THEN FI=1300
802 IF C#="BREAD" THEN FI=1350
804 IF C#="CANDY" THEN FI=1400
806 IF C#="CANS" THEN FI=1450
808 IF C#="CEREAL" THEN FI=1500
810 IF C#="CLEANING" THEN FI=1550
812 IF C#="DAIRY" THEN FI=1600
814 IF C#="DRINK" THEN FI=1650
816 IF C#="FAST FOOD" THEN FI=1700
818 IF C#="FROZEN" THEN FI=1750
820 IF C#="FUN" THEN FI=1800
822 IF C#="HYGIENE" THEN FI=1850
824 IF C#="MEAT" THEN FI=1900
826 IF C#="MEDICINE" THEN FI=1950
828 IF C#="PAPER-ETC." THEN FI=2000
830 IF C#="SAUCE" THEN FI=2050
832 IF C#="SNACK" THEN FI=2100
834 IF C#="MISC." THEN FI=2150
836 IF FI=1 THEN PRINT "NOT A CATEGORY":FOR T=1 TO 2000:NEXT T:GOTO 720
840 INPUT "ITEM":I# INPUT "CENTS-OFF":CO# INPUT "EXPIRATION":EX#
850 JX=10000
880 READ D#,E#,F#,G,H,X IF HX#FI THEN 880
890 IF HX-JX>1 THEN LET NXT=JX+1
900 IF HX-JX>1 THEN GOTO 940
910 READ D#,E#,F#,G,H,X IF JX-HX>1 THEN LET NXT=HX+1
920 IF JX-HX>1 THEN GOTO 940
930 GOTO 880
940 PRINT "J":PRINT "COUPON CONTROL":PRINT "
950 PRINT "THE FIRST NUMBER IN THE COMPUTER ENTRY
BELOW IS THE COUPON #." :PRINT
960 PRINT "WRITE IT ON THE COUPON AND FILE IT." :PRINT
970 PRINT "TO PUT THE ENTRY INTO THE COMPUTER, HIT RETURN."
980 PRINT "PRINT" (DON'T FORGET TO SAVE THE PROGRAM WHEN YOU ARE DONE.)
990 PRINT "PRINT:PRINT NXT," DATA C#,"I#,"CO#,"EX#,"NXT
1000 PRINT "TTTTT"
1010 END
1015 PRINT "J":PRINT "CATEGORIES"
1017 PRINT "
1018 PRINT "BAKING","FAST FOOD"
1019 PRINT "BEAUTY","FROZEN"
1020 PRINT "BOXED FOOD","FUN"
1021 PRINT "BREAD","HYGIENE"
1022 PRINT "CANDY","MEAT"
1023 PRINT "CANS","MEDICINE"
1024 PRINT "CEREAL","PAPER-ETC."
1025 PRINT "CLEANING","SAUCE"
1026 PRINT "DAIRY","SNACK"
1027 PRINT "DRINK","MISC."
1029 PRINT
1030 RETURN
1200 DATA ,,,1200
1201 DATA BAKING,CHOC-CHIP,,15,821130,1201
1202 DATA BAKING,CHOC-CHIPS,,15,821130,1202
1203 DATA BAKING,CHOC-CHIPS,,15,999999,1203
1223 DATA BAKING,CHOC-CHIPS,,10,999999,1223
1245 DATA BAKING,SHAKE'N'BK,,25,999999,1245
1248 DATA BAKING,SALT&PEPPER,,10,999999,1248
1250 DATA ,,,1250
1251 DATA BEAUTY,L'EGGS,,25,830630,1251
1252 DATA BEAUTY,PANTYHOSE,,25,821231,1252
1253 DATA BEAUTY,PANTYHOSE,,25,821231,1253
1254 DATA BEAUTY,COSMETIC,,50,821231,1254
1300 DATA ,,,1300
1301 DATA BOXED FOOD,KRAFT-EGG-NODDLE,,10,999999,1301
1302 DATA BOXED FOOD,HASH BROWNS,,20,999999,1302
1350 DATA ,,,1350
1351 DATA BREAD,ENGLISH-MUFFINS,,15,830430,1351
1352 DATA BREAD,BREAD-MIN,,15,830331,1352
1353 DATA BREAD,BISCUITS,,10,999999,1353
1354 DATA BREAD,BISCUITS,,10,999999,1354
1355 DATA BREAD,BISCUITS,,07,999999,1355
1356 DATA BREAD,RAISIN BREAD,,15,830228,1356
1400 DATA ,,,1400
1450 DATA ,,,1450
1452 DATA CANS,CAMPBELL'S-BEANS,,07,831031,1452
1453 DATA CANS,MUSHROOMS,,10,821231,1453
1500 DATA ,,,1500
1550 DATA ,,,1550
1551 DATA CLEANING,IVORY,,20,999999,1551
1552 DATA CLEANING,JOY,,20,999999,1552
1554 DATA CLEANING,RUG VAC,,25,821231,1554
1555 DATA CLEANING,S.O.EZY,,10,999999,1555
1556 DATA CLEANING,MR.CLEAN,,10,999999,1556
1557 DATA CLEANING,MR.CLEAN,,10,999999,1557
1558 DATA CLEANING,DISHWASH,,15,821031,1558
1559 DATA CLEANING,MR.CLEAN,,10,999999,1559
1600 DATA ,,,1600
1601 DATA DAIRY,CHEESE,,15,999999,1601
1602 DATA DAIRY,CHEESE,,10,999999,1602
1603 DATA DAIRY,CHEESE,,12,999999,1603
1604 DATA DAIRY,CHEESE,,10,999999,1604
1605 DATA DAIRY,CHEESE,,15,999999,1605
1606 DATA DAIRY,CHEESE,,15,999999,1606
1607 DATA DAIRY,CHEESE,,15,999999,1607
1608 DATA DAIRY,CHEESE,,15,999999,1608
1609 DATA DAIRY,CHEESE,,10,999999,1609
1620 DATA DAIRY,CHEESE,,15,999999,1620
1650 DATA ,,,1650
1651 DATA DRINK,HERBAL-T,,25,821231,1651
1652 DATA DRINK,COKE,25,9/30/82,1652
1700 DATA ,,,1700
1701 DATA FAST FOOD,BREAKFAST--MAC,FREE-BUY 1,820731,1701
1702 DATA FAST FOOD,CLARA'S PIZZA,1.00,820831,1702
1703 DATA FAST FOOD,CLARA'S PIZZA,1.00,820831,1703
1710 DATA FAST FOOD,BREAKFAST--MAC,FREE-BUY 1,820731,1710
1750 DATA ,,,1750
1775 DATA FROZEN,MIXED-VEG,,15,830131,1775
1800 DATA ,,,1800
1801 DATA FUN,DIG'S,#1.00,820831,1801
1802 DATA FUN,DIG'S,#1.00,820831,1802
1803 DATA FUN,BOWLING,FREE,820901,1803
1804 DATA FUN,BOWLING,FREE,820901,1804
1810 DATA FUN,FITNESS,FREE,820901,1810
1850 DATA ,,,1850
1852 DATA HYGIENE,WASH'N'DRI,,10,860630,1852
1853 DATA HYGIENE,SECRET,,50,999999,1853
1854 DATA HYGIENE,PADS,,20,830228,1854
1855 DATA HYGIENE,SPEED-STIK,,30,821231,1855
1856 DATA HYGIENE,PADS,,25,840331,1856
1857 DATA HYGIENE,FLOSS,,20,821231,1857
1858 DATA HYGIENE,PADS,,25,821231,1858
1859 DATA HYGIENE,SECRET,,35,999999,1859
1860 DATA HYGIENE,TAMPONS,,15,999999,1860
1861 DATA HYGIENE,SPEED-STIK,,15,821231,1861
1862 DATA HYGIENE,WASH'N'DRI,,10,860630,1862
1863 DATA HYGIENE,PADS,,25,840331,1863
1875 DATA HYGIENE,PADS,,25,999999,1875
1900 DATA ,,,1900
1901 DATA MEAT,CHICKEN,,10,830331,1901
1950 DATA ,,,1950
1951 DATA MEDICINE,CO-TYLENOL,,15,830228,1951
1960 DATA MEDICINE,ANALGIN,,15,821031,1960
2000 DATA ,,,2000
2001 DATA PAPER-ETC.,REYNOLDS-PLASTIC-WRAP,,25,821231,2001
2003 DATA PAPER-ETC.,GLAD-WRAP,,10,821231,2003
2004 DATA PAPER-ETC.,TRASH-BAGS,,25,821231,2004
2005 DATA PAPER-ETC.,TRASH-BAGS,,20,999999,2005
2006 DATA PAPER-ETC.,TRASH-BAGS,,15,999999,2006
2007 DATA PAPER-ETC.,TRASH-BAGS,,20,999999,2007
2008 DATA PAPER-ETC.,TRASH-BAGS,,20,999999,2008
2009 DATA PAPER-ETC.,KLEENEX,,10,999999,2009
2010 DATA PAPER-ETC.,KLEENEX,,10,999999,2010
2011 DATA PAPER-ETC.,KLEENEX,,10,999999,2011
2012 DATA PAPER-ETC.,BAGGIES,,10,850531,2012
2013 DATA PAPER-ETC.,REYNOLDS-WRAP,,15,821231,2013
2014 DATA PAPER-ETC.,TRASH-BAGS,,12,999999,2014
2016 DATA PAPER-ETC.,KLEENEX,,10,999999,2016
2017 DATA PAPER-ETC.,PAPER-PLATES,,25,830930,2017
2025 DATA PAPER-ETC.,REYNOLDS-WRAP,,10,821231,2025
2050 DATA ,,,2050
2053 DATA SAUCE,MAYONNAISE,,12,999999,2053
2054 DATA SAUCE,MAYONNAISE,,12,999999,2054
2055 DATA SAUCE,TARTAR,,15,999999,2055
2060 DATA SAUCE,MAYONNAISE,,12,999999,2060
2100 DATA ,,,2100
2101 DATA SNACK,GRANOLA,,25,999999,2101
2102 DATA SNACK,WHEAT-THIN,,10,830630,2102
2103 DATA SNACK,GRANOLA,,20,999999,2103
2104 DATA SNACK,GRANOLA,,15,999999,2104
2105 DATA SNACK,CHEETOS,,12,999999,2105
2106 DATA SNACK,LAY'S,,19,999999,2106
2107 DATA SNACK,LAY'S,,12,999999,2107
2109 DATA SNACK,LAY'S,,19,999999,2109
2125 DATA SNACK,CRACKERS,,12,830331,2125
2150 DATA ,,,2150
2151 DATA MISC.,BOOKSHOP,2.00,820831,2151
2152 DATA MISC.,CORN-OIL,,15,999999,2152
2153 DATA MISC.,CORN-OIL,,27,999999,2153
2154 DATA MISC.,BOOKSHOP,2.00,820831,2154
2155 DATA MISC.,LIGHTBULBS,,25,821231,2155
3000 DATA QUIT,QUIT,QUIT,999999,3000
READY.

```


Deflection: A Video Game for Any Commodore Computer

by Neil Harris

One of the first programs I wrote on a PET, back in 1978, was a video game called *Deflection*. The program was based on a game first described in an issue of *Kilobaud* magazine (now called *Microcomputing*), and written in 8080 assembly language. I had seen the game working on a PET, but it was slow and full of bugs, so I wrote my own from scratch.

Recently, I was re-organizing my old diskettes, and I stumbled across this game once again. It had always been fun to play, but was written for the 40-column PET. My programming instincts got the better of me, and I decided to change the program so it would work on any of our machines.

The modifications only took 15 minutes. The program works by POKEing to the screen, and the main difference between Commodore computers is the location and size of the screen. The PET's screen has 25 lines of 40 characters each, with screen memory beginning at 32768. The CBM (and SuperPet) has 80 characters per line, starting in the same place. VIC 20's screen is 23 lines of 22 characters each, beginning (in an unexpanded VIC) at 7680. The Commodore 64 has 25 lines of 40, beginning at 1024.

Lines 1050 through 1053 set the factors for your machine. Omit the words REM and the machine name on the correct line. In other words, for a PET just erase the words REM PET from line 1051. For a Commodore 64, omit the REM 64 from line 1053.

Those of you with computers that can make sounds may want to add sound effects to this program. You should use different sounds for bouncing the ball off walls, deflectors, and blocks. Put sound effects on line 3400 for hitting a block, line 5200 for a wall, 2400 for one deflector, and 2500 for the other.

When youngsters play, you might want to change the messages in line 5600 to some a little less nasty.

The object of the game is to bounce a speeding ball into blocks placed at random on the screen. You bounce the ball by placing deflectors in its path. You must time the placement just right, and placing too many deflectors will make the ball bounce on a crazy path all around the screen.

On the PET and CBM, deflectors are created using the two slashes. On the VIC and Commodore 64, the backward slash was replaced by the English pound sign.

There is one subtle special feature in this program. The variable Z holds what I call the "fudge factor". Any time the person using the

program types an inappropriate answer, like in line 1100, the fudge factor is increased. It also increases if the person uses the QUIT option to end a game. This factor is deducted from the score at the end of the game. If someone is good and types legitimate answers, they get a small bonus. If they were bad, their score goes down.

```

1000 REM--DEFLECTION BY NEIL HARRIS
1050 REM CBM SS=32768:WD=80:HT=25:SE=SS+WD*HT-1:POKE59468,12
1051 REM PET SS=32768:WD=40:HT=25:SE=SS+WD*HT-1:POKE59468,12
1052 REM VIC SS=7680:WD=22:HT=23:SE=SS+WD*HT-1:POKE6879,8
1053 REM 64 SS=1024:WD=40:HT=25:SE=SS+WD*HT-1:POKE6879,8
1100 Z=-10:INPUT"ENTER INSTRUCTIONS:R#:"
IF LEFT$(R#,1)!="N" THEN 1400
1200 IF LEFT$(R#,1)!="Y" THEN 4300
1300 Z=Z+10:GOTO 4300
1400 INPUT"TARGETS:R#:"R#:=VAL(R#):IF R#<10 OR R#>84
WD*HT THEN Z=Z+10:GOTO 5000
1450 INPUT"SPEED (0-9):"S:IF S<0 THEN Z=Z+10:GOTO 1450
1500 PRINT"OK":FOR L=ATOWN-1:POKESS+L,S:POKESE-L,S:NEXT L
1510 FOR L=WD*HT-2:WDSTEPND:POKESS+L,S:POKESS+WD-L,S:NEXT L
1530 IF R#>40 THEN S=700
1550 FOR L=1 TO R#
1600 N=INT(RND(1)*WD*HT)+SS:IF PEEK(N)<32 THEN 1600
1700 POKE N,100:NEXT L
1750 FOR L=SS TO SE:IF PEEK(L)<32 THEN N=INT(L/WD)+1:IF N=WD+1 THEN N=WD
1800 P0=T:R0=L:PO=L:DO=0:GN(RND(2)-.5):T1="000000"
1850 IF P0<32 THEN N=WD+1
1900 NP=P0+D
2200 IF PEEK(NP)<32 THEN GETA:IF J=32 THEN 3100
2225 IF J=96 THEN 5200
2250 IF J=81 THEN 5250
2300 IF J=102 THEN 3400
2350 GETA:IF A="0" THEN 5100
2400 IF J=77 THEN 2800
2500 IF A$<D=1 THEN 2700
2600 D=D+WD:GOTO 5250
2700 D=D+WD:GOTO 5250
2800 IF A$<D=1 THEN 3000
2900 D=D+WD:GOTO 5250
3000 D=D+WD:GOTO 5250
3100 IF A$="0" THEN 5100
3150 IF A$="1" THEN NP=P+1:POKE NP,78:GOTO 1900
3200 IF A$="2" THEN NP=P+1:POKE NP,77:GOTO 1900
3300 P0=NP:POKE 0,32:FOR O5=1 TO O4*5:NEXT:POKE P0,81:O0=P0:GOTO 1900
3400 T=T-1:IFT=0 THEN 3100
3500 PRINT"YOU GOT R# TARGETS USING P# PADDLES"
3600 PRINT"YOUR TIME WAS MID$(T1$,3,2):":
RIGHT$(T1$,2):"0"
3700 R=15*LOG(R#*15000/(P#*VAL(T1$)/2))-2-2*O4:PRINT
"YOUR RATING"R
3701 IF R=0 THEN P=-1
3800 RESTORE:FOR L=1 TO 10-R/10:READ R#N:NEXT L
3900 PRINT"...R#"
3950 IF D=90 THEN N=0
4000 INPUT"ANOTHER GAME:R#:"IF LEFT$(R#,1)!="N" THEN 4100
4100 IF LEFT$(R#,1)!="Y" THEN Z=Z+10:GOTO 3950
4200 GOTO 1400
4300 PRINT"THE OBJECT OF THE GAME"
4400 PRINT"IS TO DEFLECT THE BALL"
4450 PRINT"BALL THROUGH THE"
4500 PRINT"TARGETS. ONCE THE LAST"
4550 PRINT"TARGET HAS BEEN HIT"
4575 PRINT"THE GAME ENDS."
4600 PRINT"YOU DEFLECT THE BALL"
4650 PRINT"USING THE \ AND /"
4700 PRINT"KEYS. ONCE A"
4750 PRINT"DEFLECTOR IS CREATED"
4800 PRINT"IT IS IN PLACE"
4825 PRINT"PERMANENTLY."
4850 PRINT"SPEED FACTOR OF ZERO"
4875 PRINT"IS MAXIMUM."
4900 PRINT"HIT 0 AT ANY TIME"
4950 PRINT"TO QUIT"
5000 PRINT"YOU MAY CHOOSE FROM"
5050 PRINT"1 TO INT(RND(1)*WD*HT)+TARGETS:GOTO 1400"
5100 Z=Z+20:PRINT"YOU QUIT:GOTO 4000"
5200 D=D+WD:NP=NP+D:GOTO 2200
5250 P0=NP:GOTO 1900
5500 DATA AMAZING,PROFESSIONAL,"VERY GOOD",FAIR,
"KEEP PRACTICING","TRY HARDER"
5600 DATA IMP,SPAZZ,"TRY A DIFFERENT GAME"
5700 FOR L=SS+WD*O5E-WD:IF PEEK(L)<32 THEN 5900
5800 POKE L,100
5900 NEXT L
6000 FOR L=8*WD*HT
6100 N=INT(RND(1)*1000)+32768:IF PEEK(N)<32 THEN 6100
6200 POKE N,32:NEXT L
6300 GOTO 1750

```


CONGRATULATIONS TO COMMODORE CHALLENGE CONTEST WINNER

**James Dunn
of Dallas, Texas
for "Wheel of Gold"**

We received a slew of superb software from our talented readers over these past few months, but, unfortunately, could choose only one winner. Many thanks to all of you who submitted programs. They were all terrific! And keep up the good work. Who knows... maybe next time the winner will be YOU! Meanwhile, look for James' program listing in the next issue of *Power/Play*. You'll enjoy playing Wheel of Gold!



Your VIC-20 Will Smile...

VIXEL™

Volume Three

Warp

Pilot a spaceship on a hazardous journey. A fast-paced game that will keep you coming back for more.

(Needs joystick. Works on a 5K VIC-20.)

Rail

You are the chief engineer in this tricky train yard. You control twelve switches, and up to eight trains.

(Needs 3K or 8K RAM memory board.)

Fifteen

The classic puzzle: try to arrange 15 numbered tiles within a 4x4 grid.

(Needs joystick. Works on a 5K VIC-20.)

The VIXEL #3 cassette costs only \$12.95 in the US. Foreign orders add \$3.00 for shipping. California residents add 6% tax. Visa and MasterCard welcome.

The CodeWorks

Box 550, Goleta, CA 93116 805/683-1585

VIC-20*

GAMES

Cartridge:

Spiders of Mars	\$40.00
Outworld	40.00
Cloud Burst	32.00
Alien Blitz	32.00
Renaissance	40.00
Amok	32.00
Meteor Run	40.00
Sats & Mets	40.00
S kibbereen	32.00

Cassette:

Simon	\$12.00
Amok	20.00
Subchase	20.00
Alien Blitz	20.00
The Alien	20.00
3-D Maze	12.00
Raceway	12.00
Kosmic Kamikaze	20.00
Super Driver	15.00



*VIC-20 & Commodore-64 are registered trademarks of Commodore Business Machines

**Prices and Availability Subject to Change Without Notice

SOFTWARE

Business:

ViCalc	\$12.00
ViCat	20.00
ViCheck	20.00
ViTerm A	16.00

Educational:

Skymath	\$20.00
Space Div.	12.00
Super Hangman	16.00

Hardware:

Buti-3K ROM	\$72.00
Spokesman	150.00
Voice Synthesizer for (Commodore-64*), VIC-20*	
VIC-STUFF	\$5.00

A comprehensive overview of virtually all hardware and software items currently available for the VIC-20* * *

ALL ORDERS ADD \$2.00 SHIPPING

California Residents Add 6% Sales Tax / Dealers Please Inquire

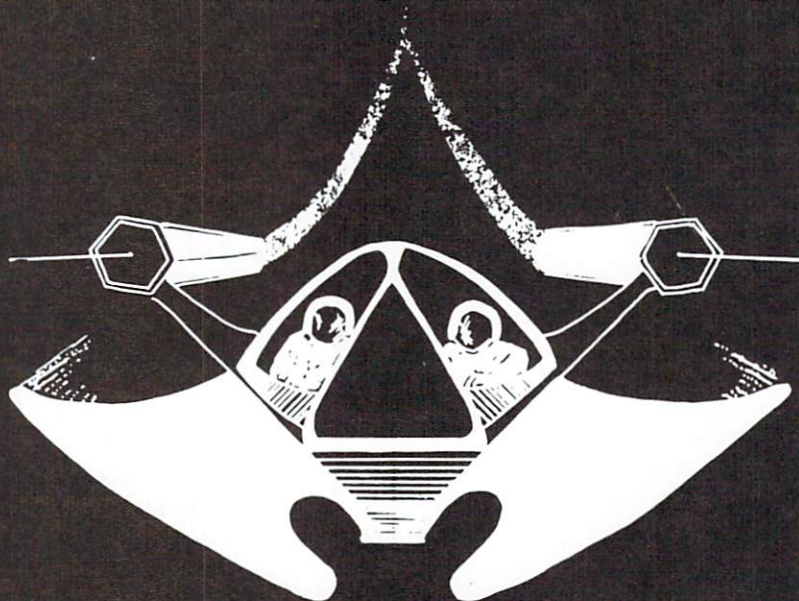
TO ORDER SEND CHECK OR MONEY ORDER TO:

MOOSEWARE INCORPORATED

Post Office Box 17868, Irvine, California 92713

WRITE FOR FREE BROCHURE & ASK ABOUT THE MOOSE CLUB.
CLUB MEMBERS RECEIVE SPECIAL DISCOUNTS ON ALL PRODUCTS SOLD.

GAME PROGRAM DEVELOPMENT KIT



for the
COMMODORE VIC - 20

VIC - 20 is a registered trademark of Commodore Business Machines, Inc.

SIX TOOLS TO HELP YOU WRITE YOUR OWN FAST ACTION ARCADE-STYLE GAMES

DECODER — Decodes programs written in machine language (like game cartridges, utility cartridges, and even the computer's own internal operating programs). Produces a program in an English-like language (Assembler) which can be studied to figure out how they did it. The programs created with the decoder can be customized with the **EDITOR** AND INCORPORATED INTO YOUR OWN NEW GAME PROGRAM. The **ASSEMBLER** turns your programs created with the Decoder and the Editor back into machine language and puts them out to tape or disk so the **LOADER** can load them into the computer's memory to be tested and RUN. The **MONITOR** assists you in debugging your new game program by allowing you to run it a step at a time and making modifications if you need to. The **INSTRUCTION GUIDE** is written so that even a beginner can learn the skills needed to become a pro!!!

DESIGNED TO RUN ON ALL VIC-20's

\$49.95 plus \$2.00 p&h buys the kit that could make you rich. Why wait?

Send check, M.O., VISA/MC (\$2.00 s.c., please include expiration date), or specify COD (add \$3.00) to:

*French
Silk*
smooth
ware

P.O. Box 207-B, Cannon Falls, MN 55009

507-263-4821

Knowledge Applied—A Joystick Version of Slither

by Paul D. Zander

(Editor's Note: Although Commodore's newest version of Slither can be used with a joystick, the older versions were designed for keyboard only. Our readers who own that older version and would like to use a joystick to play can now modify the program using Paul's suggestions here—and may learn something in the process.)

One Sunday afternoon not long ago, a friend and I were passing the time with a game of Slither on my VIC. Slither is one of the programs available in Commodore's "Recreation Pack". Earlier, we had been playing VIC Avengers using a joystick, and my friend wondered why Slither required us to use the keys to input direction commands, instead of the joystick.

Later in the week, with the help of Andy Finkel's article "Joystick Control on the VIC" from the first issue of Power/Play, I transformed Slither into a joystick game. It is an easy and uncomplicated transformation. There are more sophisticated ways to change the game. But, to keep things simple, here's what you can do.

First, LOAD Slither from cassette and LIST the program. Then add this housekeeping statement:

```
101 POKE 37139,0:DD=37154:PA=37137:PB=37152
```

Then replace the manual keyboard INPUT statement 200 with the following subroutine call:

```
200 GOSUB 9000
```

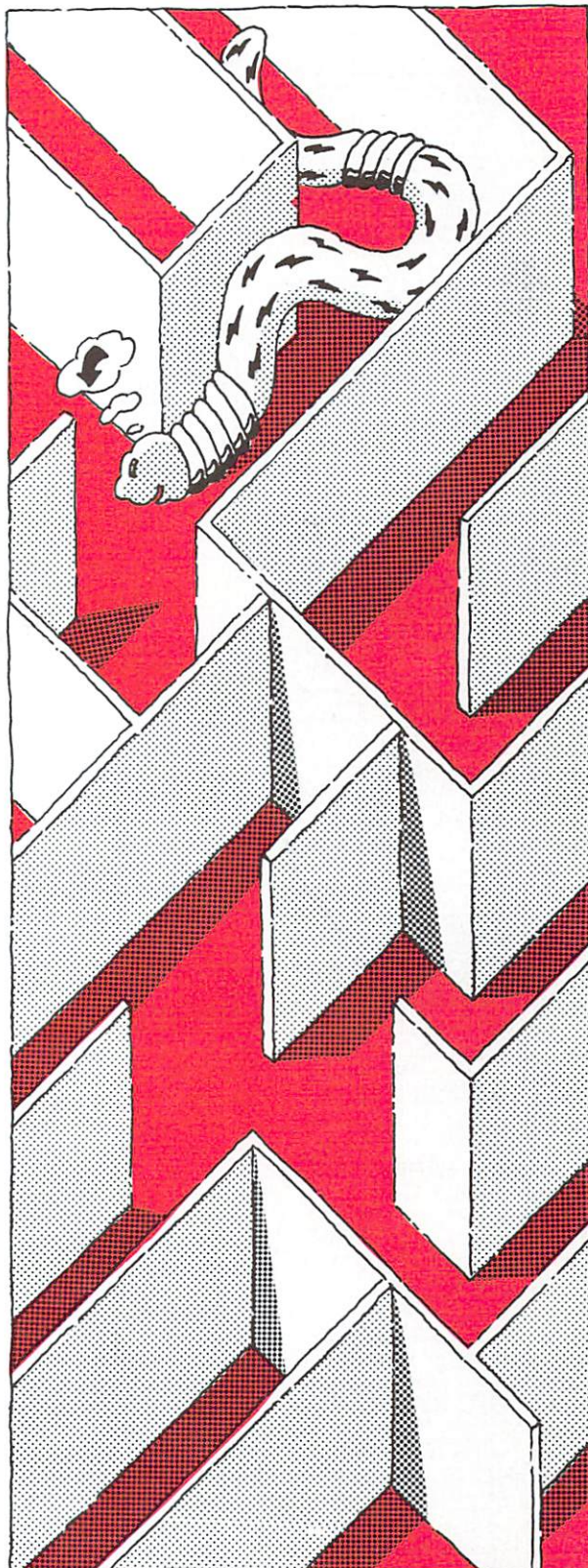
The subroutine simply obtains the joystick value and changes it to one of the I,J,K,M direction keys. After the subroutine, the program continues normally. Here's the routine:

```
999 END
9000 DZ=PEEK(DD):POKEDD,O:S3=-((PEEK(PB)AND128)=0):POKEDD,DZ
9001 ZS="L"
9010 IF S3=0 THEN ZS="K":GOTO 9100
9020 PZ=PEEK(PA):S1=-((PZ AND 8)=0)
9025 IF S1=0 THEN ZS="M":GOTO 9100
9030 S2=((PZ AND 16)=0)
9035 IF S2=0 THEN ZS="J":GOTO 9100
9040 S0=((PZ AND 4)=0)
9045 IF S0=0 THEN ZS="I"
9100 RETURN
```

Be careful, by the way, with your joystick movements. An accidental diagonal move may send your Slither worm crashing into itself! If you want to clean up the instructions printed at the beginning of the program to reflect joystick control, delete lines 40 and 41, and change line 30 to:

```
30 PRINT" (CLR) GUIDE THE MOVING WORM WITH YOUR JOYSTICK"
```

You'll want to save a copy of your new, improved Slither on one of your own tapes. If you can grasp all these changes and why they are made, you'll be ready to tackle Super Slither on the flip side of Slither. **LI**



Robert Smith

Illustration by Robert Smith

- V 1 **MONEY ADDITION**
Simple drills on adding amounts of money. 4th-5th grade. \$9.95
- V 2 **MATH WHIZ**
Two person drill on the elementary math functions of multiplication, addition and subtraction. Elem. \$9.95
- V 3 **MY BODY**
Drills children on the names of parts of the body. Elem. \$9.95
- V 4 **TESTER**
Tester from Commodore. It tests the color and sound features of your VIC-20 and color T.V. Utility. \$1.95
- V 5 **CLOCK**
Large digital alarm clock with color and sound. \$4.95
- V 6 **FOUR ACROSS**
Vertical game for two players. Similar to tic-tac-toe. \$9.95
- V 10 **SNAKE**
Like the Arcade game SURROUND. One or two players. \$9.95
- V 12 **BREAKOUT**
Adaptation of the classic Ping-Pong against the wall. All time favorite. \$9.95
- V 13 **GRAPHIC DEMO**
VIC demo from Commodore. Patterns, color, and special effects. \$1.95
- V 15 **ALPHABET**
This leaves one letter of a group of letters out. The child must fill it in. Elem. \$7.95
- V 16 **SOUND EFFECTS**
VIC demo from Commodore. Tells what kind of sound effects are possible on the VIC. \$1.95
- V 17 **SPELLING**
A word appears on the screen and then disappears. The student must then spell the word which just disappeared. Elem. \$7.95
- V 18 **PLURALS**
The computer gives the student a word and the student must decide if the word is plural or not. Elem. \$7.95
- V 19 **NUMBER NAME**
Here the student is given either a number or the name of a number. The student must then give the number or the name of the number. Elem. \$9.95
- V 20 **MIX-UP**
This program takes words and scrambles them. The student must then unscramble them. \$9.95
- V 21 **CONTRACTIONS**
This program gives the student a contraction or two words, and the student must fill in the two words which the contraction was originally, or form a contraction from the two words. Elem. \$9.95
- V 22 **PRINT COMMANDS**
Explains how to use the print command, commas, semi-colons, tabs, strings, and other ways to print. H.S. \$14.95
- V 23 **FOR-NEXT LOOPS**
Explains what they do, the loop counter, step, limits, and applications. H.S. \$14.95
- V 24 **GRAPHICS**
Many people buy VICs because of the incredible graphics capabilities. This lesson shows and explains many of the tricks of good graphics. H.S. \$14.95
- V 27 **TYPES OF VARIABLES**
Integer, real, floating point, binary, string, they are all explained and illustrated. H.S. \$14.95
- V 31 **DATA FILES**
Whether you have 8, 16, or 32k, or a VIC, you have limited storage. By using data files your storage is unlimited, but it is not easy to master the details. H.S. \$14.95
- V 33 **HISTORY OF COMPUTING**
Traces history from earliest forms of calculators to modern electronic computers. H.S. \$14.95
- V 34 **FOUR MAIN PARTS**
From the biocest IBM to the tiniest one chip computer, you always have INPUT/OUTPUT, memory, arithmetic, control. H.S. \$14.95
- V 35 **RANDOM NUMBERS**
It is impossible to create interesting games and simulations without a basic mastery of random numbers. H.S. \$14.95
- V 38 **THE VERB**
Covers action verbs, linking verbs, and verb phrases. Elem. and up. \$14.95
- V 39 **THE ADVERB**
Explanation and examples of how adverbs can modify verbs, adjectives or other adverbs. Elem. and up. \$14.95
- V 40 **THE ADJECTIVE**
Explanation and examples of how adjectives modify nouns, serve as predicate nominatives and possessive adjectives. Elem. and up. \$14.95
- V 51 **DIAGRAMMING SENTENCES**
Student is asked to supply the subject, predicate and object of many simple sentences which automatically appear in diagrammed form as he progresses. Gr. 4 and up. \$9.95
- V 54 **END PUNCTUATION**
This program is used to teach three different kinds of punctuation that can be used to end sentences. Elem. \$9.95
- V 56 **TACHISTOSCOPE**
This program flashes small groups of words on the screen in a random order. The student attempts to read and reproduce the words. The student can increase the speed of presentation. Elem. \$9.95
- V 60 **MATCHING WORDS**
The student is asked to discriminate between words that are identical and words that are very similar. SOUP SOUP is a match, but SOUP SOAP is not. Kind. 6 First grade. \$9.95
- V 63 **ADDING SIGNED NUMBERS**
This program drills you on adding positive and negative numbers. Jr. H.S. \$9.95
- V 64 **TIMES**
The computer drills you on multiplication. Elem. \$9.95
- V 65 **FRACTION REDUCTION**
The computer puts a fraction on the screen and you must type in the reduced fraction. \$9.95
- V 67 **ALPHABETIZING**
You are given two words and you must decide which one will come first in alphabetical order. Elem. \$9.95
- V 70 **COUNTRIES**
This is an educational program which tests to see if you know the location of various countries in the world. Jr. H.S. and up. \$9.95
- V 71 **LETTER SEQUENCE**
One letter of the alphabet will be blanked out and you must type in the missing letter. Preschool and Kindergarten. \$7.95
- V 72 **SILENT LETTERS**
The computer displays a word on the screen, and the student must choose the silent letters in the word. Elem. \$7.95
- V 74 **LETTER MATCHING**
The computer gives you the small letter and you must type in the matching capital letter. Preschool and Kindergarten. \$7.95
- V 75 **GUESS MY NUMBER**
You must guess the computer's number which is from 1 to 100, in as low a number of moves as possible. \$7.95
- V 76 **SPELL**
Here you tell the computer the words you have trouble with. The computer scrambles the words and you must spell them correctly. \$9.95
- V 77 **LETTERS**
You must guess the letter which the computer is thinking of. The computer gives clues if you guess wrong. \$7.95
- V 78 **BRICK**
The computer has a brick float across the screen and it disappears before it hits the window. You have to stop the brick before it breaks the glass. \$7.95
- V 79 **SHOOT**
You have to shoot a moving object. The game has five different skill levels. \$7.95
- V 80 **REVERSE**
This game is played with two sets of pens. The board starts with a set of pens at each end and you must reverse them. \$7.95
- V 81 **CAPTURE**
You have to capture the two beasts by containing them in the brick cage that you build. It has nine skill levels. \$9.95
- V 82 **WORLD CAPITALS**
An entertaining and educational variation of STATE CAPITALS. \$9.95
- V 83 **JACKPOT**
You must see this one armed bandit in action to believe it. Full color graphics and sound. \$7.95
- V 84 **STATE CAPITALS**
The computer displays a state or capital, the student types in the corresponding capital or state. Even corrects spelling mistakes. \$9.95
- V 85 **HANGMAN**
Unbelievable graphics and sound with a twist of humor. Kids of all ages will love this one. \$9.95
- V 86 **TIC-TAC-TOE**
The perennial favorite. A fast-paced colorful game. Try if you can to beat the VIC. \$7.95

- V 87 **MEMORY**
The VIC challenges your memory to the ultimate degree. Just like the old T.V. show Concentration. \$9.95
- V 88 **MATCH**
Hand and eye coordination are a must in this game. Beat the clock and get the maximum number of points. \$7.95
- V 89 **MONKS**
A devilish game of logic. It will have you glued to the VIC for days. \$7.95
- V 90 **MOSAICS**
A variation of Rubic's cube for the VIC. This game has never been seen before for any computer. We wrote the program but could not solve the puzzle. \$9.95
- V 92 **MAGIC PAD**
A mini-version of Visi-Calc for the VIC. Allows storage and retrieval of data from cassette; invaluable for personal and business use. Turns VIC into the perfect record keeper. \$20.00

- V188 **HIGH RES. DOODLE-JOYSTICK**
Use the joystick to draw high resolution pictures on a 64 dot screen. You can save to a tape for future viewing. Special graphic functions and reverse picture and reverse section. \$7.95
- V189 **HIGH RES. DOODLE-KEYBOARD**
This program allows you to draw high resolution pictures through keyboard control \$7.95
- V190 **BIORHYTHM**
Just like the biorhythm charts you find in books. \$9.95
- V191 **BLACKJACK**
Just like Blackjack in the casinos. \$14.95
- V185 **MATH DICE**
This program displays the dice on the screen and you must tell the computer the correct sum of the dice. Elem. \$9.95
- V186 **ROOT FINDER**
Finds roots to complex polynomials. \$9.95
- V187 **TUTOR MATH**
This program is designed to help students with adding and subtracting signed numbers. \$9.95

VIC - 20 SOFTWARE



VIC-20 is a trademark of Commodore Business Machines.

AMERICAN PERIPHERALS

122 BANGOR STREET
LINDENHURST, N.Y. 11757
516 - 226-5849

- V107 **BINARY NUMBERS**
This program is designed to introduce you to the binary number system and the conversion to binary from base 10 numbers and back. \$9.95
- V108 **BOMBER**
You must decide who you want to fly for. You then get to pick a target and your experience level. \$9.95
- V151 **BIZZ-BUZZ**
Math game that tests the student on division by 263. Good for elementary school students. With color and sound. \$9.95
- V152 **MISSILE COMMAND**
You have three bases and you must destroy as many space ships as you can before you run out of missiles. \$9.95
- V153 **TANK VS. UFO**
The tank is moving back and forth along the base and you must shoot the UFO before it shoots you. \$9.95
- V156 **ACEY DEUCEY**
This is a game in which the computer deals two cards face up and you must bet on whether or not the next card will have a value between those first 2 cards. \$9.95
- V180 **ARTIST**
This program allows you to draw a picture on the screen and then save it for another day. \$4.95
- V184 **HEX MONITOR**
This program allows you to enter codes in hexadecimal directly from basic. It will also convert decimal to hexadecimal or hexadecimal to decimal. \$9.95

- V192 **BEST STRAIGHT LINE**
This program finds the equation for the best straight line through the desired points on a graph. \$9.95
- V194 **SNAKMAN**
Pacman for the VIC. \$19.95
- V197 **ASTROBASE-2001**
Destroy the alien invaders from space as they attack your planet. \$14.95
- V 61 **IDENTIFYING COMPLETE SENTENCES**
A group of words are presented on the screen. The student must identify whether or not it is a complete sentence. \$7.95
- V 62A **TYPE TO READ SET A**
Set A introduces short vowel sounds between single consonants. 15 tapes \$105.00
- V 62B **TYPE TO READ SET B**
Set B focuses on consonant clusters at the beginnings and ends of words. 17 tapes. \$119.00

Please send me the
VIC 1982 CATALOG
AMERICAN PERIPHERALS
122 Bangor Street
Lindenhurst, NY 11757
NAME _____
ADDRESS _____
CITY _____ STATE _____
ZIP _____ COMPANY _____

COMMODORE'S BOOK OF GAMES FOR THE VIC 20



VIC Avenger (see inside)

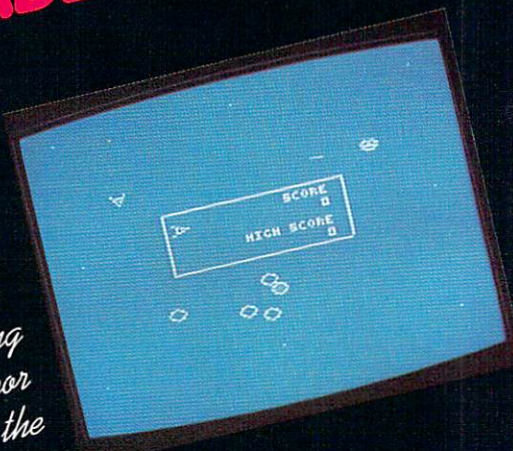
GAMES ON CARTRIDGE

Available from Commodore for the VIC 20

TRY THESE BALLY/MIDWAY ARCADE CLASSICS

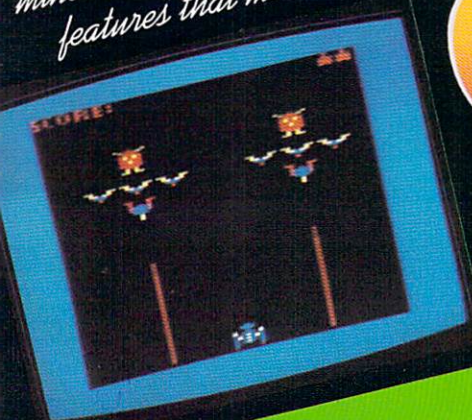
OMEGA RACE

The ultimate space game. You've got one Omegan fighter maneuvering against droid ships, command ships, death ships, photon mines and vapor mines. Fantastic "rubber band" boundaries, multiple levels of difficulty — all the features that make the Bally/Midway game so successful. One or two players.



GOLF

Midway's incredible coin-operated game includes four completely different games, multiple levels of difficulty, some of the best cartoon graphics ever devised for video games. Invaders, golfies, death ships, saucers, aliens. It's terrific!



CLOWNS

Come one, come all! See the amazing jumping clowns direct from their show-stopping Bally/Midway arcade tour! A true arcade classic. Colorful acrobatics with high-scoring skill.

SEA WOLF

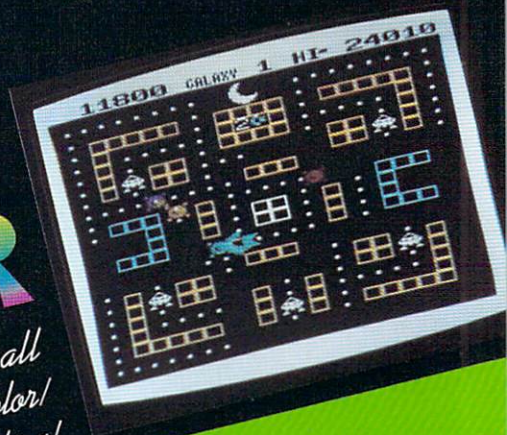
As submarine commander you are in charge of sinking and destroying all enemy ships—destroyers, freighters and P.T. boats. An explosive Bally/Midway classic. Fast action fun!



NEW
FROM
COMMODORE!!!!

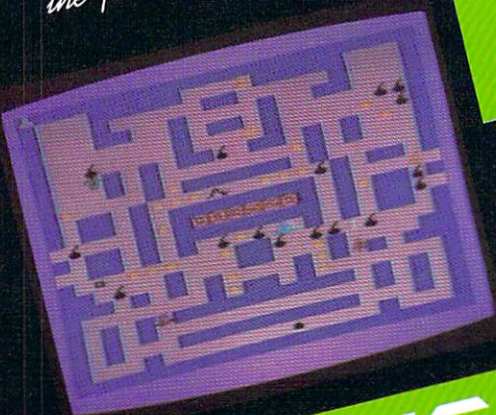
COSMIC CRUNCHER

Maneuver your "Cosmic Cruncher" through the Milky Way and "crunch" all the pulsars in the galaxy. Eleven challenging levels of play, over 300 color/maze combinations. Exciting arcade action!



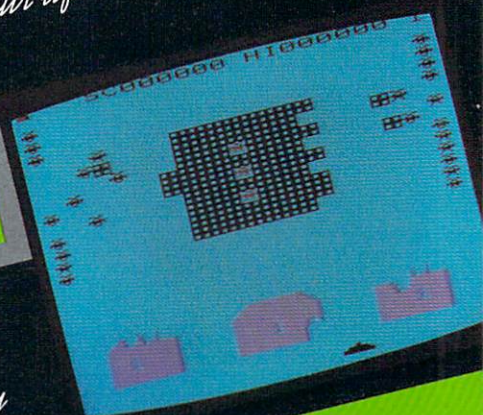
GARDEN WARS

Get your mouse through the deadly garden filled with enemies — caterpillars, snakes, snails and spiders. This is no "Garden of Earthly Delights"! Squirm, dodge and run for your life through the maze-like garden. Fast arcade action.



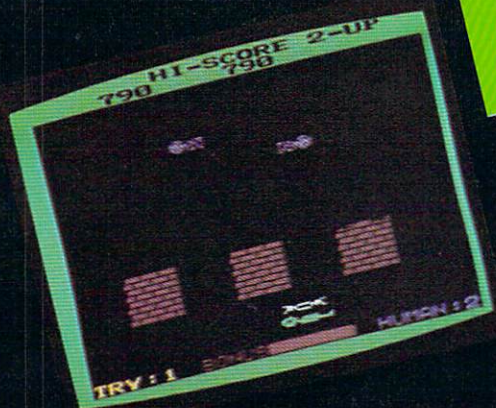
COSMIC JAILBREAK

Three deadly criminals are trapped behind bars. Can you keep them in? There's a conspiracy against you—you are constantly under attack—but you must keep the jailbreak from occurring! **SEVENTEEN** levels of play, increasingly fast action.



MONEY WARS

Lights flash, shots ring out! Can you escape or are you trapped? Look out, someone is shooting at you from the sky! Grab the money and **RUN!** Increasingly difficult levels of play, exciting action.



MORE NEW GAMES ON CARTRIDGE!!

For the VIC 20

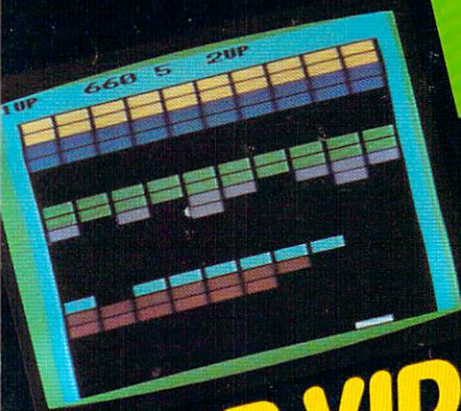
MENAGERIE

Maneuver your flea through the deadly spider swamp and on to the mystical wall for a brief rest. Quickly hitch a ride on one of the travelling menagerie of animals for the final trek through the desert.



SUPER SMASH

The World Championship is at stake! As a finalist, do you have the cat-like reflexes to return the speeding ball and take the crown? On your toes—this is racketball at its toughest!

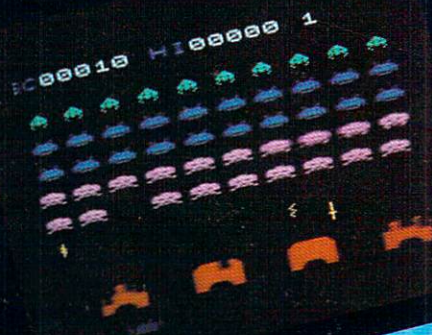


YOUR VIDEO ARCADE FAVORITES

for the VIC 20 on cartridge

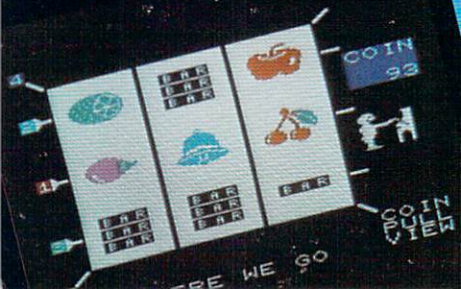
VIC AVENGER

It's an invasion of space intruders, and you're the VIC "Avenger". Space action for arcade enthusiasts.



SUPERSLOT

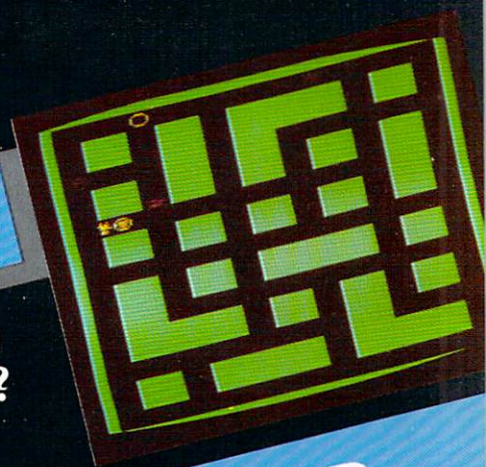
Colorful slot machine game works just like the real thing! Great music and sound effects.



MORE FAVORITES on cartridge . . .

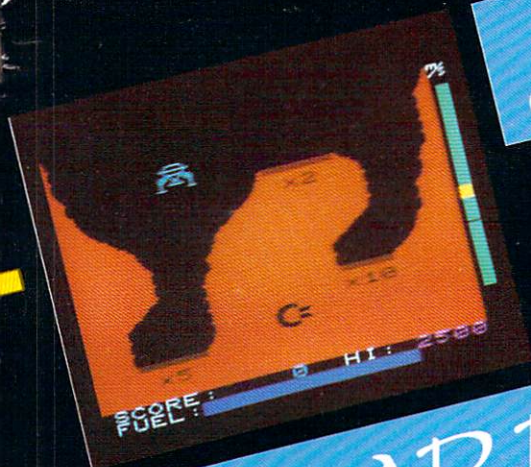
VIC SUPER ALIEN

You're trapped in a maze, and your only defense is the "alien buster". Can you capture the aliens before they zap you?



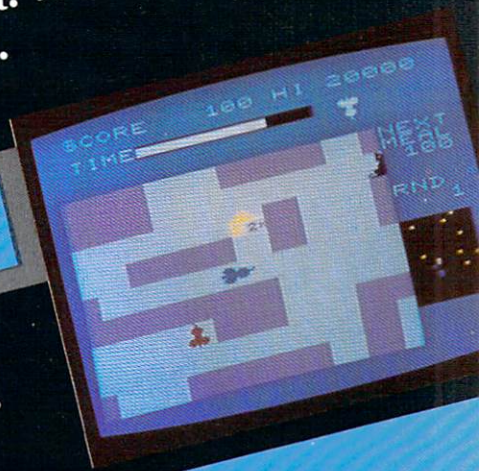
JUPITER LANDER

Pilot your Jupiter Lander through the treacherous crevices of a mysterious planet. Variable rocket thrust, anti-gravity, horizontal retros.



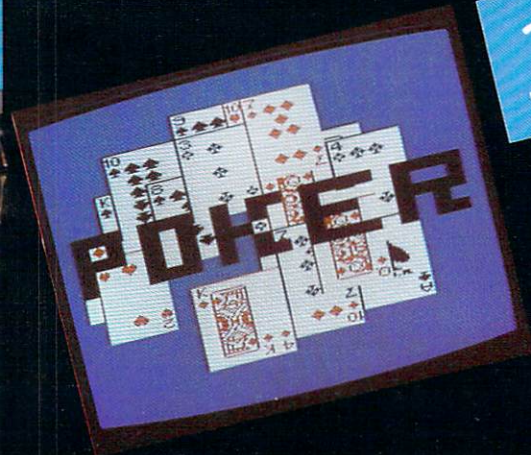
RADAR RAT RACE

The magical mouse maze makes for a fast-paced, challenging game of wit, strategy and reflexes. Excellent graphics.



DRAW POKER

Casino-style poker recreates the real thing! Superb animation and sound effects add to the fun, mystery and luck.



AND EVEN MORE FAVORITES on cartridge...

MIDNIGHT DRIVE/ROAD RACE

An unusual computer challenge provides thrills, chills and... spills?

Authentic night driving simulation provides thrills, chills and... spills?

An unusual computer challenge provides thrills, chills and... spills?

RAD ON FORT KNOX

You're scurrying through a complex of tunnels below Fort Knox. Just ahead you spot the gold! Now grab it and try to escape before the guards find you!

CHILDREN'S SERIES on cartridge

THE SKY IS FALLING

A great "first" game to teach motor skills.

Fun for grownups, too!

Help Chicken Little by catching pieces of the falling sky! A great "first" game to teach motor skills.

MOLE ATTACK

A colorful cartoon action game. Keep those nasty moles underground! How many can you clunk before time runs out?

VISIBLE SOLAR SYSTEM

A colorful cartoon action game. Keep those nasty moles underground! How many can you clunk before time runs out?

Astronomy buffs love this game-science-learning tool. Journey to the major planets of our solar system, learn key statistics about each planet. Or record atmospheric conditions and compare planetary statistics using "Astro Calc".

HOME BABYSITTER

Three preschool game programs help teach counting, the alphabet and relationship skills. The parents' manual helps you help your child.

BINGO/SPEED MATH

Two learning games in one. Learn to add, subtract, multiply and divide while having fun.



SARGON II CHESS

In a class by itself!

SEVEN challenging playing levels in this one, called the BEST microcomputer chess game by experts. Makes the VIC a challenging chess opponent.

SCOTT ADAMS ADVENTURE GAMES

Challenging fantasy games take you through the mythic realms of your own mind, seeking treasure and escape.

ADVENTURE LAND ADVENTURE

Wander through an enchanted world trying to find the 13 lost treasures. You'll encounter wild animals, magical beings and many other perils and puzzles. For beginning Adventurers and veterans alike.

PIRATE COVE ADVENTURE

Meet up with the Pirate and his daffy bird, and encounter many strange sights as you try to go from your London flat to Treasure Island. Can you recover Long John Silver's lost treasure?

MISSION IMPOSSIBLE ADVENTURE

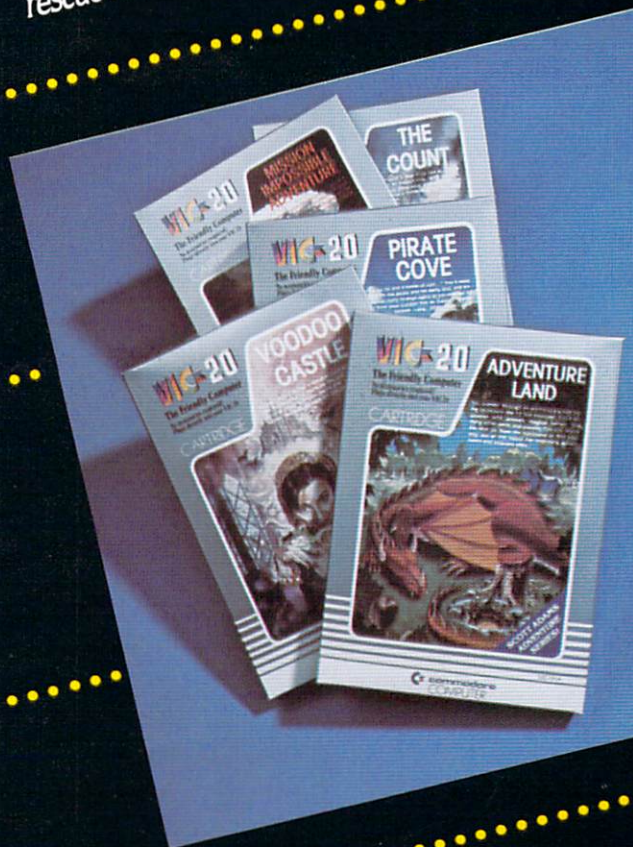
Can you complete your mission in time? Is the world's first automated nuclear reactor doomed? This one "radiates" excitement!

THE COUNT

You wake up on a large brass bed in a Transylvanian castle. Who are you, and what are you doing here? And WHY did the postman deliver a bottle of blood? It's love at first byte!

VOODOO CASTLE

Count Christo has a fiendish curse put on him by his enemies. There he lies, and you are his only hope! Can you rescue him?



GAMES ON TAPE

Use these games with your Commodore datasette tape recorder.
All six available in Commodore's Recreation Program Pack.

Car Chase: Fast-paced road action
VIC 21: Casino-style blackjack
Blue Meanies from Outer Space: Shoot down aliens

Biorhythm/Compatibility: Compare biorhythms
Spacemath: Math improvement, grades 1-6
Slither/Super Slither: Dexterity game

CREATE YOUR OWN GAMES

with these programming aids from Commodore

VIC 20 Super Expander cartridge

Everything we could pack into one cartridge—3K memory expansion, high resolution graphics plotting, color, paint and sound commands. Graphic, text, multicolor and music modes. 1024 x 1024 dot screen plotting. All commands may be typed as new BASIC commands or accessed by hitting one of the VIC's special function keys. Includes tutorial instruction book.

VICMON Machine Language Monitor cartridge

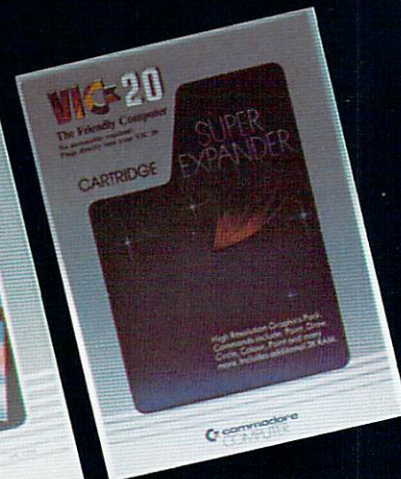
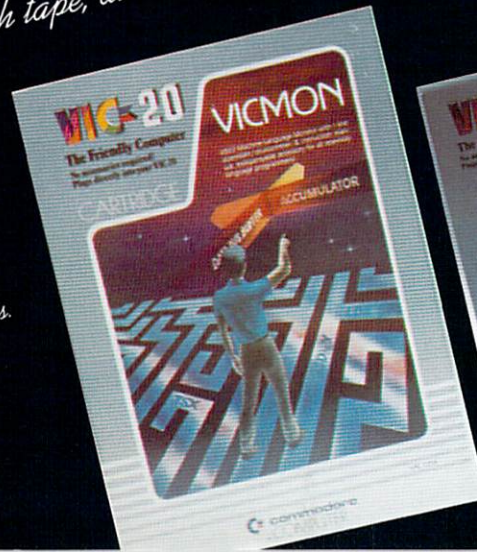
Helps machine code programmers write fast, efficient 6502 assembly language programs for quick game action. Includes one line assembler/disassembler.

Programmable Character Set/ Gamegraphics Editor on tape

Lets the VIC create up to 64 programmable characters and use them in BASIC programs. Takes only one-half kilobyte of program space. Works with tape, disk and printer.

Commodore
COMPUTER

Contact a Commodore retailer in your area for any of these exciting arcade style games.





Snow'em with your VIC!



Simplify your printer set-up with

SMART ASCII.....\$59.95

At last! A simple, convenient, low-cost printer interface. **It's ASCII:** connects the VIC or '64 to your favorite parallel printer (Epson, Microline, Smith-Corona TP-1, etc.). **It's SMART:** translates unprintable cursor commands and control characters for more readable LISTings.

Converts user port into parallel port with Centronics protocol, addressable as Device 4 or 5. **Three print modes:** CBM ASCII (all CAPS for LISTing); true ASCII (UPPER/lower case for text); and TRANSLATE (prints (CLR), (RED), (RVS), etc.). For any size VIC or the '64. Complete with printer cable and instructions.

UN-WORD PROCESSOR 2...\$19.95

The improved UN-WORD retains the practicality and economy of the original. Easy-to-use text entry and screen editing. Use with any size VIC (5K to 32K). Supports VIC printers, RS-232 printers, and now **parallel printers***, too. Handy user Menu selects: single- or double-space, form feed, print width, number of copies. Supports printer control codes. With complete documentation.

*Parallel printers require an interface. See SMART ASCII.

BANNER/HEADLINER.....\$14.95

Make GIANT banners on your printer. Prints large characters across the page or sideways down the paper roll...how about a 10-ft. long "Welcome Home!". VIC or RS-232 printers.

VIC-20 is a trademark of Commodore Business Machines

ORDER DESK

Open 9 am - 4 pm

(816) 254-9600

VISA/Mastercard add 3%
C.O.D. add \$3.50



**MIDWEST
MICRO associates**

PO BOX 6148, KANSAS CITY, MO 64110

MAIL ORDER: Add \$1.25 shipping and handling. Send money order for fastest delivery. VISA/Mastercard send #and exp. date (3% added). Missouri residents include 4.6% sales tax. Foreign orders payable U.S.\$, U.S. Bank ONLY; add \$5 shipping/handling.

All programs on
high quality digital
cassette tape.

Write for free brochure.
Dealer inquiries invited.

VIC-PICs...IMPROVED!...\$19.95

Now with **hi-rez draw routine** for your joystick **PLUS** hi-rez **dump to VIC printer**. Features 19 fascinating hi-rez digitized pictures. Capture your creativity, or ours, on paper. Amazing fun!

GRAFIX DESIGNER.....\$14.95

Design your own graphic characters! Recall, erase, edit, copy, rotate...save to tape or disk for use in your own programs. Simple to use. Includes examples and demo routines.

GRAFIX MENAGERIE.....\$14.95

Three-program set shows off VIC graphics potential for art, science, music, business...learn by seeing and doing. Contains **BASIC plotting routines** you may extract and use.

TERMINAL-40.....\$29.95

Join the world of telecommunications in style: **40-character lines** and **smooth scrolling** text for easy reading! All software — no expensive hardware to buy. **4K** (or larger) **Receive Buffer** with optional dump to VIC printer. Function key access to frequently-used modes. Fully programmable Baud, Duplex, Parity, Wordsize, Stopbit, and Linefeed; supports control characters. Requires VIC-20, 8K (or larger) memory expansion and suitable modem. With 24 p. manual and Bulletin Board directory.

Introducing SOFTWARE FOR THE NEW COMMODORE 64

'64 TERMINAL (\$29.95). Same impressive features as TERMINAL-40: **smooth-scrolling**, 40-character lines, VIC printer dump, etc. **GIANT 24K Receive Buffer.** No memory expansion required; requires '64 and modem.

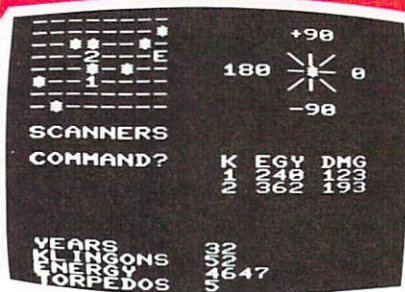
'64 GRAFIX SAMPLER (\$19.95). Indulge in the graphics splendor of the '64. Interact with demos of techniques such as **plotting** of points, lines and 3-D objects; **drawing** in the hi-rez mode (joystick control); animating **sprites**; plus assorted graphics displays. Routines may be extracted for use in your own programs.

'64 PANORAMA (\$19.95). Explore picture graphics on the amazing '64! Nineteen fascinating **digitized** pictures **PLUS hi-rez draw routine** for your joystick **AND** hi-rez **dump to VIC printer**. Capture our pics or your creativity on paper.

'64 BANNER/HEADLINER (\$19.95). Make **GIANT banners and posters** with your '64 and printer. Supports VIC printers, RS-232 printers (requires interface), and parallel printers (requires Smart Ascii).

Victory Fun Now Ready

Available now from stock. All these new programs fit in the standard VIC-20 memory and can be controlled from the keyboard. Where appropriate from a joystick as well. All programs on cassette tape.

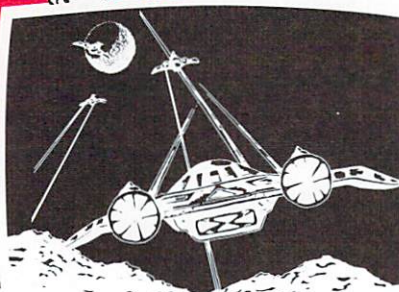


TREK* \$12.95

The classic game that has fascinated computerists for over a decade. Commanding the bridge of your starship, you explore the galaxy, fending off the Klingon invasion with your phasers and photon torpedoes, at the same time conserving your limited time and energy. A real bargain at \$12.95.

LUDWIG'S LEMON LASERS \$14.95

You'd never think blasting lemons out of the sky could be so much fun! Fast machine code action. One or two players. Written by the demented doctor who gave us "Hospital Adventure".



ANNIHILATOR \$19.95

Defend your planet against the hostile aliens. All machine code makes this "Defender-like" program one of our best arcade games. Joystick required.

ADVENTURE PACK I* (3 programs) \$14.95

Big Bad Wolf—NOT for kids only! A fully packed adventure based on the Three Little Pigs fairy tale. Don't let the wolf gobble you up!

Computer Adventure—Re-live the "excitement" of getting your computer. An adventure with a very different flavor.

Moon Base Alpha—You must find a way to destroy the meteor that is racing towards your base, or else all moon colonies will be demolished!



KONGO KONG \$19.95

Climb ladders, avoid the barrels the crazy ape is rolling at you, and rescue the damsel. Fast machine code action.

ADVENTURES

I still can't believe we packed full featured adventures into the VIC's 3.6K memory! Adventures are interactive fantasy games in which you solve a mystery by exploring an unknown environment with the assistance of your computer. You tell the computer what to do with plain english commands like "OPEN THE DOOR", and the computer tells you what it sees! Average solving time for our adventures is six hours.

ADVENTURE PACK II* (3 programs) \$14.95

African Escape—As the sole survivor of a plane crash, you must find your way out of the dark continent.

Hospital Adventure—You are a spy whose mission is to complete the bungled assassination attempt on the evil dictator, who is recuperating in the hospital under heavy guard.

Bomb Threat—Get back to town to warn the authorities of the bomb planted by the terrorists who left you prisoner at their hideout.

-Tape Programs dy for Holiday Giving!



TREASURES OF THE BAT CAVE **\$14.95**

Battle the vampire bats as you search their cave for gold bullion. Fast, real time action will keep you playing for hours. Of course, you are in a different cave every time you play (the action takes place against the realistic 3-D display of the MAZE program).

MAZE **\$12.95**

Don't buy this program if you suffer from claustrophobia! You try to find your way out of a maze on foot. The display gives an incredible 3-dimensional view. Machine code sub-routines allow you to move as quickly as you can push buttons. You may view the maze from the top if you get hopelessly lost.

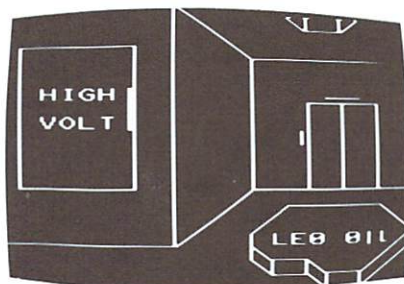
Plus, there are over 6×10^{23} different mazes that the program can generate. There is little chance that you'll see the same maze twice! There are nine levels of difficulty included.

VICTORY CASINO* **\$9.95**

Enter the pleasure palace and try your luck at dice, numbers, and bluffing. Match your wits against 3 unique games of chance.

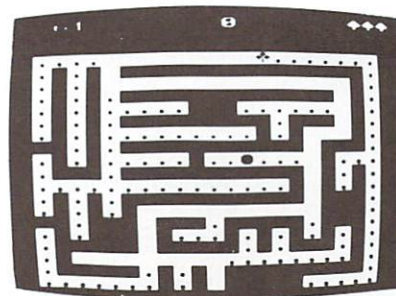
GET FOUR* **\$14.95**

The classic vertical game of tic-tac-toe. Play against a friend or the computer as you try to get four in a row. The computer can play one of four different strategies (not just levels).



GRAVE ROBBERS* **\$13.95**

Introducing the first GRAPHIC ADVENTURE ever available on the VIC-20! With realistic audio-visual effects, you explore an old deserted graveyard and actually see the perils that lie beyond.



STREET SWEEPERS **\$14.95**

Gobble up all of the dots in the maze before the ensuing nemesis gets you. The maze is different every time, and if you succeed in getting all the dots, you get progressively harder mazes to complete as your skills increase. Does this sound like Pac Man? It isn't! Highly recommended and extremely addicting.

MANCALA* **\$8.95**

Mancala survived over 3000 years from ancient Egypt so that you could play it on your computer! The computer plays masterfully on its hard level, competently on the easy level for learning purposes. If you enjoy chess or awari, you might just give them up for MANCALA. Easy to learn, difficult to master.



ORDERING

We accept personal checks, money orders, VISA, and MASTERCARD. Charge orders please include number and expiration date. Overseas orders please use charge or have check payable through a U.S. bank. Add \$1.50 postage and handling per order. PA residents please add 6% sales tax.

***NOW AVAILABLE
FOR THE
COMMODORE 64!**



2027-A S. J. Russell Circle, Elkins Park, PA 19117
(215) 576-5625

**PROGRAMS
AVAILABLE
for the
COMMODORE
64**

OMEGA RACE

The Finer Points

by David Berezowski

Present Omega Race Champ

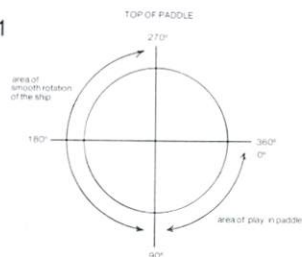
Tired of getting wiped out by the DROID FORCE? Want to hit 40,000 and get that much-deserved free ship? Or better yet, want to get six-digit scores? Here's how to do it! (Or at least how I did it!)

1. Get rid of that joystick! Grab firm hold of the game paddle, it's the OMEGA WARRIOR'S controller!

Here are some points to remember when using the paddle.

P1. The paddle doesn't rotate 360 degrees. It has what one might call a limited area of movement. It is this 'limited area of movement' that the young OMEGAN must learn to control and later master to become a WARRIOR!

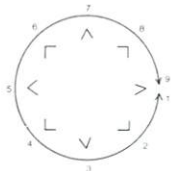
FIGURE 1



Referring to Figure 1, you can see that the paddle only rotates 270 degrees. Of this 270 degrees, approximately 180 degrees gives you a smooth rotation of your ship. The other 90 degrees is sort of like the play in a car's steering wheel. Don't be fooled by the play in the paddle.

P2. DEAD SPOTS:

FIGURE 2



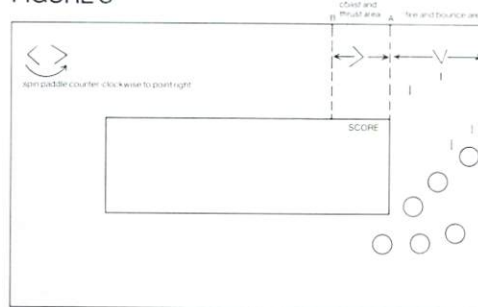
Referring to Figure 2, note that as you turn the paddle clockwise, your ship turns clockwise and vice-versa. HOWEVER, if you have turned your ship clockwise to position 9, and want to continue on to position 2, you can't! Note that the same is true if you're at 1 and want to go to 8. Therefore, when pointing left (<) remember what position you're at (either 1 or 9). If you're at 1 and want to go to 8, you'll have to quickly spin the paddle clockwise, and vice-versa if you're at 9 and want to go to 2.

2. When starting a new screen or round, always point your ship left (<). If the round begins with your ship on the right side of the screen

then you are pointing in the right direction. (Proceed to step 3, The Technique). However, if you are on the left side of the screen, then quickly spin your paddle counter-clockwise so that you are pointing right (>). You are now ready for The Technique!

3. The TECHNIQUE: (This is what you've all been waiting for!). The whole secret to what I'm about to say lies in the fact that the DROIDS base their missile firing direction on where you are on the screen at the time they decide to fire at you. If you can get them to fire where they can't hit you, then you can blow them to bits. Here's how to do it!

FIGURE 3



T1. Referring to Figure 3.

a) Make sure you are pointing right (>). (You'll have to quickly spin the paddle counter-clockwise if you were following my instructions earlier!)

b) Thrust to a moderate speed and point your ship down (V), after you have finished thrusting.

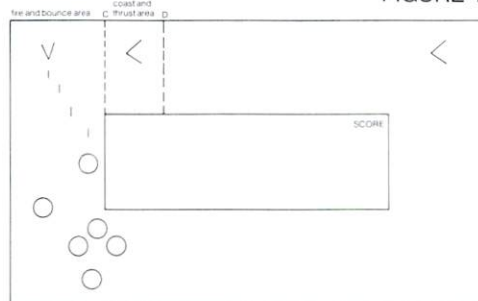
c) When you reach point A, rapidly fire down at the DROIDS. Continue to fire until you have bounced back to point A.

d) Point the ship right (>) (make sure you turn the paddle clockwise to get to this position). When you reach point B, thrust to a moderate speed and point the ship down (V) again (after you have finished thrusting of course).

e) Go to step C until all the DROIDS are dead.

f) Clean up as many 'mines' as you can and prepare for the next round by pointing your ship left (<).

FIGURE 4



T2. Referring to Figure 4.

Use the same technique as T1, except use points C and D instead of A and B, and point your ship left, instead of right. (You shouldn't have to turn your paddle if you were following my instructions earlier!)

Why does the above work??? If you time it right, by bouncing back and forth at a moderate speed, the DROIDS will fire at you while you are right of point A or left of point C. Fortunately they will fire up at an angle and their missiles will harmlessly hit the inner boundary. Thus there will be few (if none at all) missiles threatening you and you are free to fire down at the DROIDS. It's almost like shooting fish in a barrel!

NOTES

N1. Don't fire repeatedly into an explosion. They tend to act like black holes and 'eat' oncoming missiles. Better to space your missiles apart and wait until the explosion has disappeared.

N2. Don't fire more than four times in a row. The system tends to store up the fifth button press. After four missiles have been fired and the first missile 'dies', a fifth missile is mysteriously fired from your ship. THIS CAN REALLY THROW YOUR TIMING OFF! To see this in motion, try the following. Start the game and point your ship so that the missiles will fire along the top of the screen. Now quickly press the fire button five times. Four missiles will be fired and travel across the screen.

As the first missile 'dies', a fifth missile will fire from your ship even though you haven't pressed the fire button!

N3. Pressing shifted F3 (i.e., F4) will give you five ships to start with instead of three. However, when reporting high scores, remember to note how many ships you started with!

N4. Using different color combinations might improve your game. I like a black background with cyan characters.

N5. Try and destroy the flashing DROIDS first. These guys soon turn into DEATH STARS which fly faster than you do and are very deadly. Never fire at a DEATH STAR head on. You must learn to anticipate where he is going and fire at where you think he will be, not where he actually is. This is due to the fact that the DEATH STAR flies so fast, that if you shoot right at him, by the time the missile gets there, he will be somewhere else.

N6. When in real danger, don't sit there like a dummy and shoot. It's much better to run away (firing as you go of course)!



*Good Luck,
David Berzoush*

THE COMMODORE CHALLENGE PRIZES PRIZES PRIZES

If you've been playing around at home developing original games and programs for your unexpanded VIC 20, send your best — on cassette or disk, please — to the Commodore Challenge contest. Include a brief description of the program's purpose, including documentation on how to use it. If it's a game, be sure to include instructions.

Programs requiring memory expansion are eligible, too, but will not be published unless space allows.

Each issue, we'll award prizes to two entries. First place winners will receive a VIC 20 8K Memory Ex-

pander Cartridge. Second place winners will receive a VIC 3K Memory Expander. All entries become the property of Commodore Business Machines, Inc., upon submission. Winning entries published by POWER/PLAY will become public domain software.

Fill out the entry form below, and submit it with your game or program to:

Commodore Business Machines, Inc.
The Meadows,
487 Devon Park Drive
Wayne, PA 19087
Attn: POWER/PLAY

COMMODORE CHALLENGE CONTEST * * * ENTRY FORM

Name _____ Age _____ Phone _____

Address _____ Program Title _____

City _____ State _____ Zip _____

I understand that my software entry becomes the property of Commodore Business Machines, Inc., upon submission, and that winning entries published by POWER/PLAY become public domain software.

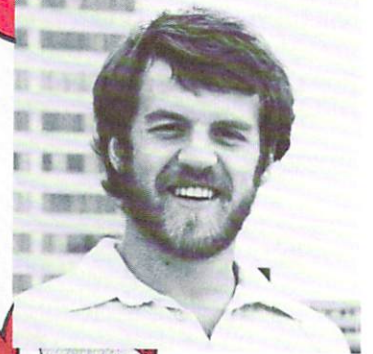
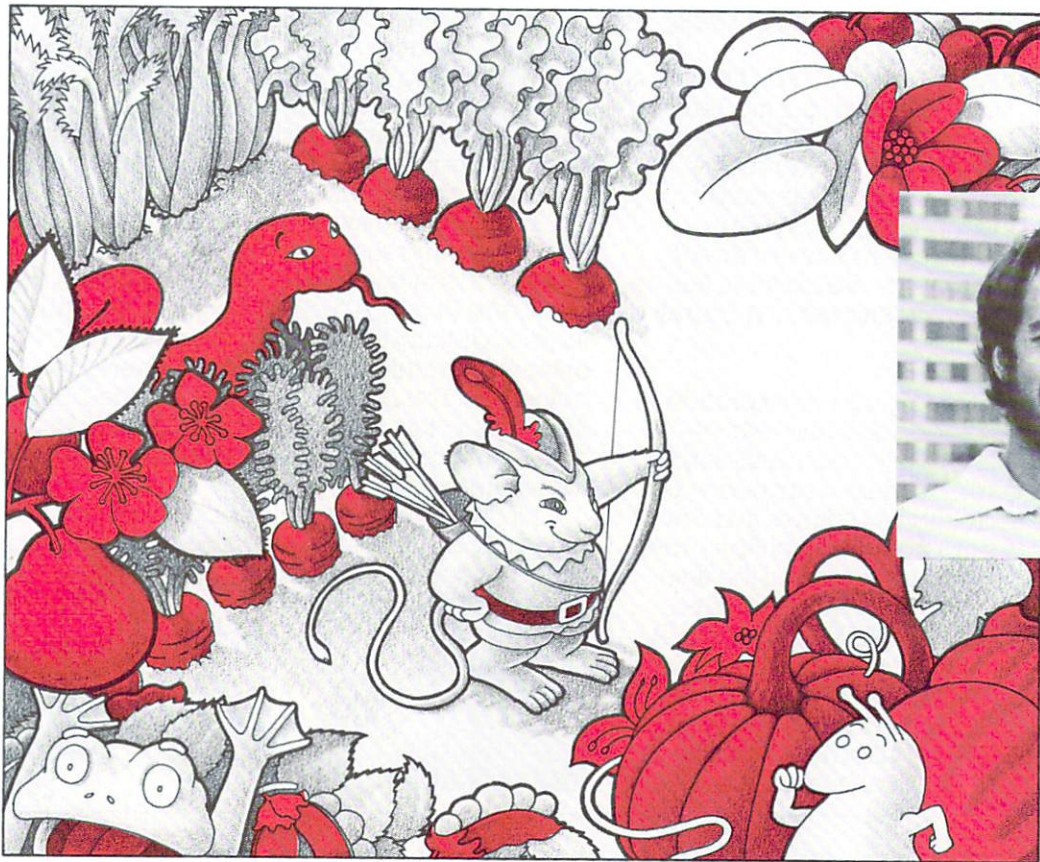
Signature _____

Parent's signature, if contestant is minor _____

VOID WHERE PROHIBITED

Behind the Programs

An Interview with Rick Madge, Creator of Garden Wars



Rick Madge

Rick Madge, the 25 year-old creator of Commodore's Garden Wars cartridge game, talks very softly on the phone (our method of communication for this interview), and seems to enjoy playing around on his computer more than he enjoys being interviewed. Nevertheless, he provides some interesting insights into how he came up with this unusual and challenging maze game, and (for those of you who aspire to seeing your name in our High Score column) some tips on how to score better.

Power/Play: For starters, who are you and what do you do in your real life?

Rick Madge: I'm a research engineer—an electrical engineer—for Ontario Hydro. My job right now is to investigate the effects of power lines on radio transmissions.

P/P: With that kind of background, how did you get into writing games?

RM: About three years ago, when I first started with Ontario Hydro, I was using one of their PETs as part of my job. I started playing around with it and decided I wanted one for myself. Before that my only experience with computers had been with the mainframes at university, which are not user friendly. The PET was a welcome change.

My first game was a golf game, but it was pretty crude because I was just learning BASIC—I'd only had a brief exposure to FORTRAN at university. Since then I've written a whole mess of games, but they're mainly just for

myself, for my own amusement.

I especially like designing adventure-style games, where you program a little maze and wander around, getting attacked by monsters. I've also put together a program for playing the card game Euchre, but that's a 32K game for the PET.

P/P: In the game market the big thrust seems to be toward "space" or "cosmic" kinds of themes. How did you come up with the idea for something as down-to-earth as Garden Wars?

RM: I wrote a program called Rat Man, first. Garden Wars evolved out of that idea. It seemed to me to be something people could identify with, something familiar. And it's hard to come up with a new concept in a space game. Even if it's different, it would look like what's already out there.

P/P: How did you decide what elements would go in? For instance, the wiggling snakes impressed me.

RM: The snakes were easy. The truth is, things that seem most impressive are usually easy to do. But things that seem simple—like keeping the program running—are a lot harder.

When I was deciding what would go in, as usual there had to be chasers and chasees. Then, one way of fighting the chasers is to have arrows, so I gave the chasee arrows. But I wanted to have something that wasn't just killing, so I put in paralyzing, instead.

When the bombs explode, they send paralyzing shock waves in all four cardinal directions. Also, when the spiders turn blue, you can't kill them anymore. You can only stun them. And once they turn black, you can't get rid of them at all. Then you just have to run away from them.

I went through a number of things people typically associate with gardens to decide what to put in. I would have liked to put in flying insects that wouldn't be restricted to the boundaries of the maze, but it would have taken too much memory. As it was, I ended up with only about 8 bytes left once it was finished.

P/P: What do you consider the outstanding features of the game?

RM: First, you have all the various creatures that leave behind bombs and eggs. Then the spiders come from the eggs. If you don't kill them, they turn blue or black, and there are more and more of them. Another feature is the eight levels of play, with eight different mazes. I also like the treasures. There are eight of them, also. They're those flashing things you see appearing and disappearing.

P/P: What are the clues to scoring well in all that craziness?

RM: The best attack is to kill creatures and eat eggs. Also, don't shoot treasures, because when you do that they disappear and come up somewhere else. But if you run over a treasure, you get 100 points per treasure per level, and if you get all eight on one level you get 1000 points added at the end of that level. I tried to make it so a person couldn't just spend their whole time shooting. The clue to really racking up points is to get the treasures.

P/P: What do you see as the weaknesses of the game—the things you would have liked to improve?

RM: I would have liked to have had the flying insects come across the screen, but, as I said, that would have taken another 300 bytes that just wasn't there.


P/P: Did you run into any other obstacles as you were working on the game?

RM: None in particular. The main problems were in debugging, because it was my first attempt at programming in assembly language and I was always making dumb mistakes—typos mainly. Occasionally it would take me a week or so to find the mistake, so that held things up sometimes.

P/P: Among the computer games you've played, which one is your favorite?

RM: I usually don't play computer games. I've been too busy programming, and I like to program more than play.

P/P: For all our hot games people, what's your high score on Garden Wars?

RM: So far I've scored 81,000. 

Editor's Note: We've excluded game creators from our High Score competition.

High Scores

VIC AVENGER

9,060

Bram Koster, Otterville, Ontario

JUPITER LANDER

207,400

Christopher Champlain,

St. Petersburg, FL

SUPER ALIEN

45,700

Robert Schaeffer, Brookline, MA

MIDNIGHT DRIVE

14.11 km

Nathan Mehl, Newark, DE

RADAR RAT RACE

122,240

John Higginson, South Holland, IL

SUPER SLOT

7,306 coins

Jerry Krueger, Cary, IL

PINBALL

1,500,000

Joe Ferrari, Commodore,

Toronto

MOLE ATTACK

309

Barbara Brey, Phoenix, AZ

DRAW POKER

12,819

Angie Traina, Jonesboro, LA

CAR CHASE

75,865

Zach Coleman, Charlotte, NC

SLITHER

325

Kelly Stanley, Florissant, MO

SUPER SLITHER

129

Robert Schaeffer, Brookline, MA

BLUE MEANIES

800

Jon Alderman, Willowdale,

Ontario

GORF

55,000

Joe Ferrari, Commodore,

Toronto

OMEGA RACE

3 ships: 194,050

5 ships: 204,980

David Berezowski,

Commodore, Toronto

GARDEN WARS

68,430

Joe Ferrari, Commodore,

Toronto

We had several high scores come in too late to make this issue. We'll get them into the March issue. If your score didn't set a record this time, keep playing! Maybe you'll topple these champion gamers next time!

Microphys Programs

PET



VIC-20

2048 Ford Street
Brooklyn, New York 11229
(212) 646-0140

PET



VIC-20

Microphys, a leader in educational software development, is pleased to announce the release of several recreational software programs for use with the Commodore VIC-20 microcomputer. The VIC programs, described below, require a 3-K expansion cartridge and utilize the VIC's excellent color graphics and sound capabilities. Each program retails for \$15 and is accompanied by complete instructions.

PROGRAM DESCRIPTIONS

PV901 - Missile Math: this program presents in a game format, an opportunity for youngsters (ages 5-15) to practice and develop the basic skills of addition, subtraction, multiplication, and division. Four levels of difficulty in each skill area may be selected. Problems in a given skill are randomly generated and missiles are launched at correct answers. The computer displays the results on each program run and may be directed to generate the same sequence of problems so that review and 'match play' (against an opponent) are possible.

PV350 - Cryptograms: this program permits the generation of 'secret' messages which are to be decoded. These cryptograms are displayed along with their unique code number classifications. To decode a cryptogram, the program is run from line 9000. Family members can challenge each other with their individually created messages. If you enjoy solving the cryptograms appearing in newspapers and crossword puzzle magazines, this program is perfect for you. Note: two VIC users may exchange encoded messages. User 1 creates a secret message and transmits this to user 2. The code number will permit user 2 to have his VIC decipher the message should he encounter any difficulty.

PV340-349 - Anagrams: this series of programs provides an educational challenge for virtually all age groups. The VIC randomly generates scrambled words which are to be identified. Two clues are provided in order to assist in this process. The clues in the school and college categories are generally definitive in nature. Many of the words used are part of the Microphys Spelling and Vocabulary series for the associated grade levels. Thus, reading, vocabulary, and spelling skills are reinforced by these Anagram programs. Note: the same sequence of words generated may be requested so that 'match play' is possible. There are 5 level-of-difficulty categories each consisting of two programs.

PV340-341 Recreational
PV346-347 Junior High

PV342-343 College
PV348-349 Elementary

PV344-345 High School

PV375-380 - Wheel-of-Fortune Word Games: this series of programs represents an exciting challenge for every member of the family. Players try to fill in missing letters in a randomly generated title or phrase and earn and lose points according to the graphic display on a 'Wheel-of-Fortune'. The scores of as many as four players are displayed, 1000 points being required to win a given game.

PV375 Song Titles
PV378 Statesmen

PV376 Famous Places
PV379 Scientists

PV377 Entertainers
PV380 Sports Figures

PV601-644 - Missile Spelling: this series of 36 programs enables youngsters in grades 4 through 12 to practice and develop basic spelling skills. Each program contains 60 graded words. The VIC randomly selects groups of 5 words, one of which is spelled incorrectly. Missiles are launched in order to destroy the word misspelled. The words chosen for grades 7 - 12 correspond to the Microphys Vocabulary series. Note: there are 4 programs in each grade level.

PV601-604 Grade 12
PV616-619 Grade 9
PV631-634 Grade 6

PV606-609 Grade 11
PV621-624 Grade 8
PV636-639 Grade 5

PV611-614 Grade 10
PV626-629 Grade 7
PV641-644 Grade 4

PV401-460 - Vocabulary: each vocabulary program randomly generates graded words which are to be defined. A sentence, in which the word is properly used, is displayed when an incorrect response is made. Using this contextual clue, a second opportunity to define the word is given. Reading and spelling skills are also reinforced as a more powerful vocabulary is developed. There are 10 programs in each grade level.

PV401-405 and PV431-435 Grade 12
PV411-415 and PV441-445 Grade 10
PV421-425 and PV451-455 Grade 8

PV406-410 and PV436-440 Grade 11
PV416-420 and PV446-450 Grade 9
PV426-430 and PV456-460 Grade 7

FOREIGN AND DOMESTIC DISTRIBUTOR INQUIRIES WELCOMED.

Making Friends with Sid

by Paul Higginbottom

The synthesizer chip in your Commodore 64 computer is affectionately known as Sid. Sid is in fact an acronym for Sound Interface Device. I doubt that many people realise just how powerful this chip is, but I intend to unleash some of its power for you. If you've read some of the documentation for the Commodore 64 about its sound capabilities and are new to (as I was) synthesizer jargon, you probably thought to yourself, "I'm never going to figure that out!" Well, I am the sort of person who gets more determined to figure something out when it seems harder than ever to do so. So, step by step, I, like any beginner, set about learning how to control the Sid's sound capability.

The Jargon

If your mind is like mine and tends to go blank when confronted with a barrage of alien jargon about something, then hopefully I can gently "break you in" with the terms associated with music synthesis using Sid.

The Sid chip is comprised of three sections essentially:

- 1) Oscillator section
- 2) Envelope section
- 3) Filter section

There are a few other bits and pieces, but more on those later.

Sid has three **voices**. That means to you and me, that up to three tones can be played at the same time.

Each voice is separately controlled by its **frequency** (the pitch of the tone), and more importantly, its **envelope**.

The envelope of a voice determines how its volume rises, sustains, and falls, like a musical instrument, or other sounds we hear in our lives. For example, a violinist will maybe play a note by pulling the bow across a string slowly at first (the volume starting out low). As the player starts to increase the speed and pressure of the bow on the string, so the volume increases, and as the player ends the note, he or she slows the rate and pressure of the bow again, and the volume fades away to silence.

With a single violinist, the tone may fade away rather abruptly, but I'm sure you've heard this rising and falling effect of volume with a piece of orchestration (many string instruments). That is one example of an envelope.

If we consider another example to allow you to grasp different types, think of hitting a cymbal. The rise to its maximum volume is almost instant, as the CRASH of the cymbal begins, and from that point, the sound simply fades away slowly to silence again. An example of a cymbal type of sound that does rise slowly first and then fade away would be a wave approaching the beach. You hear the slowly increasing volume of the wave moving up the beach, then as the wave trips over itself and hits the beach the loudest part of the noise is heard, and then the sound fades away as the wave slides up the beach and the next one approaches again.

Well, enough of the examples, back to the technical stuff. This "behaviour" of the volume (or **amplitude**) of a voice, can be defined in 4 parts, and this terminology is common amongst professional synthesizers costing many times the price of your Commodore 64 computer!

The four parts of an envelope

You may have noticed by now, that to define this changing in volume, we simply need to define the **TIME** it takes for a sound to go from one volume to another volume. For example, the violin might have taken half a second to go from no volume (silence) to its maximum volume, and then 2 seconds to fade away again (silence again). The cymbal took no time to reach its maximum volume (starts with the CRASH), but 10 seconds to fade away. The wave is different again, in that it might take 5 or so seconds to build up to maximum volume (as it moves up the beach), and then only 1 second to die away (as the wave falls over and crashes on the beach).

Part 1 — ATTACK — This is the time taken to go from silence (0 volume) to the maximum volume Sid is set to.

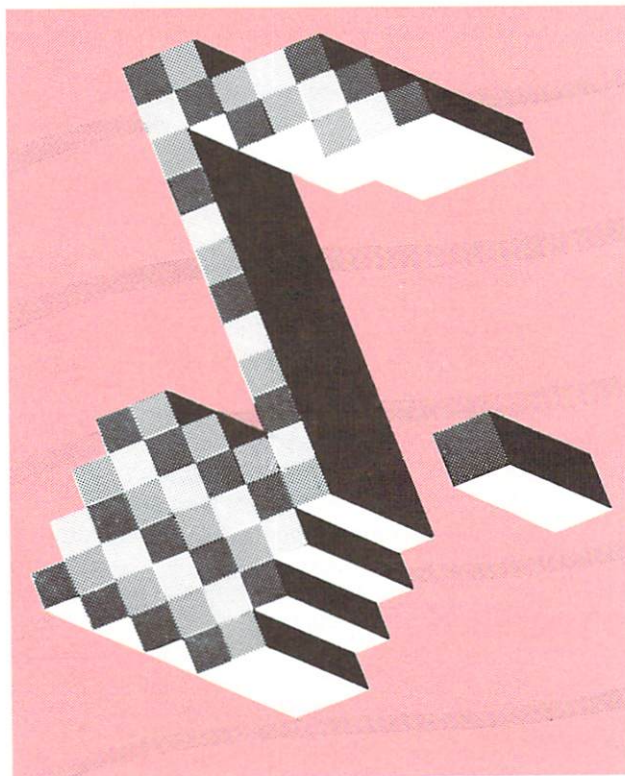


Illustration by Robert Smith

Part 2—DECAY—This is the time taken to go from the maximum volume Sid is set to, to a given "mid-point" volume or sustained level of volume.

Part 3—SUSTAIN—This is not a time value, but is a level of volume the voice sustains at after the ATTACK and DECAY.

Part 4—RELEASE—This is the time taken to go from the sustained volume to silence once again.

In those definitions, I mentioned "the maximum volume Sid is set to", and that is the maximum overall volume (just like the overall volume control on your television or stereo).

How we control Sid

Before I go any further, I want to explain how we actually tell Sid exactly what weird and wonderful sounds we want it to make (so we can drive everyone crazy!).

The Sid chip has an amount of memory in it, and simply by putting numbers into those memories we give Sid all the information it needs to produce an infinite number of sounds. We put numbers into memories with the BASIC command POKE. We give the POKE command two numbers; the memory number (or 'address'), and the number we want to put into that memory (one memory location can hold any whole number between 0 and 255).

Sid's address is quite a big number. He starts at 54272, and he occupies that memory location and the next 28 also, up to 54300.

I want to show that it really is **not** that difficult to train Sid, and that you **don't** have to be a genius at programming.

Making your first beep

To make a noise, we must do 4 things:

- 1) Set the maximum overall volume
- 2) Set the envelope of the voice we wish to use
- 3) Set the frequency of the voice to the desired pitch
- 4) And only then 'tell' Sid to do it.

I put quotes around 'tell' in part 4, because I want to examine that closer. When we tell Sid to make a sound, we tell it to firstly do the ATTACK (rise up to maximum volume) and then the DECAY (go down) to a SUSTAINED level of volume. When we tell Sid to do that part, the noise will stay at the SUSTAINED level of volume forever if you don't tell it to go on and do the last part—the RELEASE (go down from the sustained level of volume, to nothing).

So to recap, we tell Sid to do the ATTACK-DECAY-SUSTAIN part first, and then when we're ready, we tell it to finish the envelope with the RELEASE part.

You could get a person to demonstrate this for you. Ask them to take a DEEP breath when you tap them on the shoulder and then hum a note, at first quietly, building up to a loud level,

and the going down to a comfortable level. You have made a person do the Attack-Decay-Sustain part of an envelope.

I said the sound will continue indefinitely if you don't tell it to release, so when you tap the person again on the shoulder, they can slowly quiet their hum down to nothing. Of course if you decide to make them sustain for too long, they'll go blue in the face, and pass out! (Also, you may want them to stop before they get to the release, because their hum is so obnoxious!) (Fortunately, you can also do this with the Commodore 64!)

For now, let's just concentrate on ONE voice. Each voice has 7 memories inside Sid, to control it. Voice 1's memories are in fact, the first 7 memories, voice 2, the second 7, and voice 3, the next 7. That, if you've been doing your math, includes the first 21 memories in Sid. The other 8 (there are 29 in all) are for the filter section, which I haven't talked about yet, and other bits and pieces, including the overall volume control I have mentioned.

The 7 memories for each voice are all organized the same way. For example, the first two of each block of 7 control the frequency (pitch) of the voice.

The 7 memories for a voice

The first two, as I just mentioned, control the frequency of the voice; that is, the pitch of the sound.

The second two are to control one particular type of sound, which will be covered later.

The fifth memory is the controlling memory of the voice, the one that will tell Sid to start the note, stop it, and choose the type of sound.

The sixth memory controls the duration of the Attack and Decay.


The seventh memory controls the Sustain level, and the Release time.


The fifth of the seven I just described, I will now explain further. I mentioned that apart from telling Sid to play the envelope, it also controls the **type** of sound. (Another piece of jargon coming up!) The type of sound is known as the **waveform**. You are probably aware that sound is comprised of air being compressed and stretched. By, for example, a speaker cone, which moves in and out. The speed (the FREQUENCY) at which it moves in and out determines the pitch.




The way in which air is compressed and stretched is cyclic (repeats itself), and this cycle is known as the waveform.

Sid allows you to choose from one of four waveforms. It is the fifth of the seven memories in each voice that you set to tell Sid which waveform you wish to use.

The Waveforms

Triangular (shaped like this: ) This waveform, due its smoothness produces a mellow, soft flute-like sound (very pleasant to the ear!)

Sawtooth (shaped like this: ) This waveform, due to its abrupt ending produces a brighter, brass-like sound.

Variable width pulse (shaped like anything from this: , to this: , or this:  [which if you look is simply the first one upside-down]) This waveform as you can see from the description in parentheses can be varied, but is essentially an ON and OFF waveform, and as such is very abrupt and produces anything from a hollow, organ-like sound, to a very quiet, reedy sound. As you can see from the symbols of this waveform, it is comprised of pulse, or varying widths (hence the name). Memories 2 and 3, which I mentioned earlier were for a specific type of sound, do in fact control the width of the pulse when this waveform is chosen. Of course, memories 2 and 3 have no effect when any other waveform is selected.

Noise—I won't try to do a little drawing of this waveform, since it is in fact a RANDOM waveform, and has no defined harmonic qualities, but because the frequency can be altered, will produce any sound from a hiss (like you hear from poor quality cassette recorders), to a low rumble (good for special effects in games).

Please note the format of the memory locations used. I mentioned that the first TWO bytes are used to select the frequency, but did not say how one would know what values to put in one and the other. The easiest way to look at it, I would expect would be thus:

Since one memory location can only contain a number from 0 to 255, to represent larger numbers, they are stored as 0 to 255 in the first byte (known as the **low** byte), and multiples of 256 added to this in the second byte (known as the **high** byte), which means two bytes can hold a number from 0 (0 in both locations), to 65535 (255 in the first one, plus, 255 times 256 in the second one).

The ATTACK-DECAY memory, and the SUSTAIN-RELEASE memory are comprised as follows:

The ATTACK, DECAY, SUSTAIN, RELEASE parameters can all be one of 0 to 15. To form the ATTACK-DECAY value for memory location 6 in a voice's 7 memory locations, simply multiply the ATTACK by 16 and add the DECAY value. This again gives a combined value from 0 ($0 \cdot 16 + 0$) to 255 ($15 \cdot 16 + 15$).

The control register works differently still. The value is calculated as follows:

Add 1 to begin Attack-Decay-Sustain cycle; don't add 1 to begin the Release cycle.

Add 16 to select triangular wave form, 32 for sawtooth, 64 for variable width pulse, or 128 for noise waveform.

There are other parts to add to this value, but they won't be covered here.

The beep program

Turn on your Commodore 64, and type in the following program:

```
10 SID=54272
20 FOR I=0 TO 28:POKE SID+I,0:NEXT
30 POKE SID+24,15
40 POKE SID+1,20
50 POKE SID+5,0*16+0
60 POKE SID+6,15*16+9
70 POKE SID+4,1+16
80 POKE SID+4,16
```

Description of the program

Line 10 defines a variable SID, to the start of Sid's memory locations.

Line 20 should be included in all of your sound programs, and is a FOR...NEXT loop to simply set all of Sid's memory locations to 0 to ensure that no previous programs will affect our efforts.

Line 30 sets memory location 24 in Sid to 15. Register 24 controls the overall volume of Sid (and some other things which need not be known here), and 15 is the maximum volume (from 0 to 15).

Line 40 sets the upper byte of the frequency value of voice 1 to 20, which means a setting of $0 + 20 \cdot 256 = 5120$.

Line 50 sets the ATTACK value of voice 1 to 0, and the DECAY value also to 0, which means when we tell Sid to do its ATTACK-DECAY-SUSTAIN cycle, it will simply go straight to the SUSTAIN volume, since we've told it not to do any ATTACK or DECAY at all.

Line 60 sets the SUSTAIN value of voice 1 to 15 (maximum volume), and the RELEASE value also to 9, which means when we tell Sid to do its RELEASE cycle, it will take about three quarters of a second to fade away to nothing.

Line 70 sets the control register of voice 1 to do the Attack-Decay-Sustain sequence, with the triangular waveform selected (+16).

Line 80 sets the control register of voice 1 to do the Release part of the envelope, again with the triangular waveform selected (+16).

Having typed in this program, type:


RUN

And the familiar:

READY.



message will come back almost immediately, with the mellow sound fading away (provided you have the volume control on your television set up reasonably high so you can hear it!)

Well, there's a LOT of new things for you to absorb in this article before we can go on to further things. We've only done a PING so far, but we'll have Sid playing Bach soon enough (or maybe a little Genesis?). 

LEARN

Discover how easy it is for you to get useful results from your VIC.

Understanding Your VIC Volume 1: Basic programming uses a proven step-by-step approach to teach programming. It costs \$11.95

A cassette tape with two demonstration programs from the book is available for \$7.95. It will save you typing time and eliminate typing errors.

VIC Software

Easy to use program for you to create new characters for graphics or games. Cassette \$9.95.



See your dealer or order direct
VISA/MC accepted
Money back guarantee
Please add \$2 (\$8 overseas)
for shipping and handling

TIS INC.

Total Information Services, Inc.
Box 921, Dept. CM
Los Alamos, NM 87544

Dealer inquiries invited.

TAYLORMADE SOFTWARE • TAYLORMADE SOFTWARE

TAYLORMADE SOFTWARE • TAYLORMADE SOFTWARE • TAYLORMADE SOFTWARE • TAYLORMADE SOFTWARE • TAYLORMADE SOFTWARE

for the COMMODORE VIC-20

- TOUCH TYPING TUTOR 2.0 (TTT-5K) \$15.95
Learn to type with all fingers by following the keyboard and finger placement pictured on the TV screen. 19 lessons fully described in manual. Using computer generated pseudo words learn your rate and errors.
- STAKEOUT (SO-JS) \$14.95
5K strategy game for 2 players using joystick. Object is to fence in the most territory. With 3K or more memory expansion you may play against VIC.
- VIC LEMONADE (VL-5K) \$14.95
Classic economics game for 2 players. Tunes and color graphics. Maximize your profits by choosing the best prices, advertising, & quantity to match randomly varying weather conditions. Make a million dollars starting with \$2 if you can!
- MORSE CODE TRAINER (MC-5K) \$19.95
Learn Morse Code - speed 1-35 wpm. Character speed may be set faster than word speed. Random code groups or your own practice message.
- AEROBICS POINTS CALCULATOR (APC) \$24.95
Disk Version - (APC-D) \$29.95
Finds & keeps track of weekly aerobics points for running, walking, swimming, cycling for any time or distance. With 3K or more memory expansion 25 additional activities. Menu selected program plus 12 page manual.

Shipping/handling per order:
U.S. or Canada \$1.50
Foreign U.S. \$ + \$3.00

TAYLORMADE SOFTWARE



P.O. Box 5574
Lincoln, NE 68505
(402) 464-9051



VIC is a trademark of Commodore Business Machines, Inc.

TAYLORMADE SOFTWARE • TAYLORMADE SOFTWARE

**Computer
Case
Company**

AN OPEN AND SHUT CASE FOR COMPUTERS



CM703

CALL TOLL FREE: (800) 848-7548

Your sizable investment in your computer should be protected. If you have to load and unload your computer every time you want to move it, you must consider the possible damage. Computer Case Company has solved your computer protection problem. Once your equipment is safely inside the attache-style carrying case, it never has to be taken out again. Simply remove the lid, connect the power, and operate. For storage, disconnect the power, enclose your disks, working papers, and manuals in the compartments provided, and attach the lid. Case closed. Judge for yourself.

- CM703 Commodore 64/VIC with Disk Drives \$129
- CM704 Commodore 64/VIC with Dataset 109
- AP105 12 inch Monitor (B&W) 99
- AP106 AMDEK Color I, II or III 119
- P401 Paper Tiger 440/445/460 99
- P402 Centronics 730 Series 89
- P403 Epson MX70, MX80 89
- P404 Epson MX100 99
- P405 IDS 560 or Prism 132 Printer 109
- P406 Starwriter F10 Printer 119
- CC80 Matching Attache Case (5") 85
- CC90 Matching Attache Case (3") 75
- CC91 Matching Accessory Case 95
- CC92 5.25 Diskette Case 49

5650 Indian Mound Court • Columbus, Ohio 43213 • (614) 868-9464



OUR MOST POPULAR "ARCADE GAME" TAPE PROGRAM
FOR VIC-20 COMPUTERS

SUPER PARATROOPER!!

FANTASTIC SOUND AND ACTION WITH SUPER HI-RES GRAPHICS
(A PROTECTO ENTERPRIZE EXCLUSIVE)

By Nic Dudzik



SUPER PARATROOPER is a High Resolution game that doesn't let you make any mistakes. You are in charge of a big gun that sweeps back and forth by your command. Helicopters fill the sky, (and we mean fill the sky!), dropping paratroopers. Your mission is to keep 3 paratroopers from hitting the ground on either side of your gun. But that's just the beginning. You score by hitting the helicopters or the paratroopers, but if you miss a shot it subtracts from your score. Therefore, you must make every shot count to make a high score! IT HAS FOUR FAST ACTION LEVELS TO CHALLENGE THE BEST PLAYER.

LIST \$24.95 – **SALE \$19.95**

The High Resolution graphics helicopters are fantastic. They look exactly like helicopters! The paratroopers are super realistic. Their chutes open and then they drift down to earth. If this weren't enough the sounds are fantastic. There are helicopter blades whirring and you can hear the howitzer pumping shells. When you hit a parachute you hear this ripping sound and the paratrooper falls struggling to the ground! NOW HEAR THIS! — If you let three paratroopers land, they bring in a tank from either side and blast you!!! This game really shows off the sound and graphic capabilities of your VIC. SUPER PARATROOPER IS OUR NO. 1 SELLING ARCADE GAME — you've got to get this game to believe it — we are so sure you'll like it we'll give you "10 DAY FREE TRIAL."

RUNS ON STANDARD VIC-20



we are
commodore VIC
experts!!

PROTECTO
ENTERPRIZES (FACTORY DIRECT)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

machine language routine. . . (SYS to it from BASIC then PEEK the memory locations used by the subroutine).

```

1000 *****
1010 ** FOUR PADDLE READ ROUTINE (CAN ALSO BE USED FOR TWO)
1020 *****
1030 :AUTHOR - BILL HINDORFF & JOE MCENERNEY
1040 PORTA=$D000
1050 CIOORA=$D002
1060 SID=$D400
1070 **=$C100
1080 BUFFER **++1
1090 POLY **++2
1100 POLY **++2
1110 **=$C000
1120 POLRD
1130 LDX #1 ;FOR FOUR PADDLES OR TWO ANALOG JOYSTICKS
1140 POLRD0 ;ENTRY POINT FOR ONE PAIR (CONDITION X 1ST)
1150 SEI
1160 LDA CIOORA ;GET CURRENT VALUE OF DOR
1170 STA BUFFER ;SAVE IT AWAY
1180 LDA #C0
1190 STA CIOORA ;SET PORT A FOR INPUT
1200 LDA #80
1210 POLRD1
1220 STA PORTA ;ADDRESS 1ST PAIR OF PADDLES
1230 LDY #80 ;WAIT A WHILE
1240 POLRD2
1250 NOP
1260 DEY
1270 BPL POLRD3
1280 LDA SID+25 ;GET X VALUE
1290 STA POLY,X
1300 LDA SID+26 ;GET Y VALUE
1310 STA POLY,X
1320 LDA PORTA ;TIME TO READ PADDLE FIRE BUTTONS
1330 ORA #80 ;MAKE IT THE SAME AS OTHER PAIR
1340 STA POLY+2 ;BIT 2 IS POL X, BIT 3 IS POL Y
1350 LDA #40
1360 DEX ;ALL PAIRS DONE?
1370 BPL POLRD1 ;NO
1380 LDA BUFFER
1390 STA CIOORA ;RESTORE PREVIOUS VALUE OF DOR
1400 LDA PORTA+1 ;FOR 2ND PAIR -
1410 STA POLY+2 ;BIT 2 IS POL X, BIT 3 IS POL Y
1420 CLI
1430 RTS
1440 JEND
READY.

```

The paddles can be read by using the following BASIC program:

```

10 C=124096:REM SET PADDLE ROUTINE START
11 REM POKE IN THE PADDLE READING ROUTINE
15 FORI=0TO53:READA:POKEC+I,A:NEXT
20 SYS:REM CALL THE PADDLE ROUTINE
30 P1=PEEK(C+257):REM SET PADDLE ONE VALUE
40 P2=PEEK(C+258):REM " " TWO "
50 P3=PEEK(C+259):REM " " THREE "
60 P4=PEEK(C+260):REM " " FOUR "
61 REM READ FIRE BUTTON STATUS
62 S1=PEEK(C+261):S2=PEEK(C+262)
70 PRINTP1,P2,P3,P4:REM PRINT PADDLE VALUES
72 REM PRINT FIRE BUTTON VALUES
75 PRINT:PRINT"fire a ":"S1,"fire b ":"S2
80 FORW=1TO50:NEXT:REM WAIT A WHILE
90 PRINT"S":PRINT:GOTO 20:REM CLEAR THE SCREEN AND DO AGAIN
95 REM DATA FOR MACHINE CODE ROUTINE
100 DATA162,1,120,173,2,220,141,0,193,169,192,141,2,220,169
110 DATA128,141,0,220,160,128,234,136,16,252,173,25,212,157
120 DATA1,193,173,26,212,157,3,193,173,0,220,9,128,141,5,193
130 DATA169,64,202,16,222,173,0,193,141,2,220,173,1,220,141
140 DATA6,193,88,96
READY.

```

VIC20™ PERSONAL COMPUTER

ARCADE GAME CHRISTMAS SALE!!

10 Most Popular Tape Programs (for VIC-20)

Rank	Name	List	Sale
1.	Super Paratrooper (Fantastic)	\$24.95	\$19.95
2.	Exterminator-Plus (Bugs all over!!)	\$24.95	\$19.95
3.	Cricket (It's jumping)	\$24.95	\$19.95
4.	3-D Hackman (3-Dimensional)	\$24.95	\$19.95
5.	Snackman (Eat 'em up)	\$19.95	\$15.95
6.	Bug Blast (Creepy)	\$19.95	\$16.95
7.	Anti Matter Splatter (Nuclear Disaster)	\$24.95	\$19.95
8.	Bombs Away (Great)	\$18.95	\$15.95
9.	3-D Maze-Escape	\$16.95	\$14.95
10.	Krazy Kong	\$16.95	\$14.95

BUY ANY FOUR — DEDUCT 10% MORE

10 DAY FREE TRIAL!

2-4 Day Delivery-First Class Mail.
1 Day Delivery - Express Mail.

We Have Over 500 Programs.

ASK FOR FREE CATALOG!

WE LOVE OUR CUSTOMERS
(our prices prove it)

PROTECTO
ENTERPRISES (FACTORY DIRECT)
BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

TYPRO

DATA MANAGER & WORD PROCESSOR

For COMMODORE 4032/8032 Computer with 4040/8050 Disk Drive

DATA MANAGER

- Number of records is only limited by disk capacity.
- Unlimited fields per record.
- Up to 75 characters per field.
- User formatted.
- Screen editing.
- Sort/Search feature.
- Pattern matching search.
- Selective field printing.
- Form letter address insertion.

WORD PROCESSOR

- Screen Editing.
- Automatic line set.
- Add, move or delete text.
- Global edit.
- Page numbering/titling.
- Form letter address insert.
- File append for printing.
- Selective underlining.
- Line justification.

Special Introductory Offer.

Both DATA MANAGER and WORD PROCESSOR for only \$89.00
(or either one @ \$55.00 each.)

When ordering: Specify Computer model number and Disk model number.

For Instruction Manual only: send \$3.50 (Refunded with first order.)

INPUT SYSTEMS, INC. 25101 S.W. 194 Ave. Homestead, FL 33031 (305) 245-3141
DEALER INQUIRIES INVITED.

A Little Exercise in Machine Language

Jim Butterfield, Toronto

The first language you meet when you turn on your PET, VIC, or CBM is BASIC. It's powerful and convenient. But deep inside your computer is another language, faster and more powerful, which is working behind the scenes to make the good things happen.

We'll do an experiment to get a glimpse of this inner superlanguage, called "machine language" or more accurately "6502 machine language".

If you have a VIC, remove any memory expansion.

Now: type the following lines:

```
10 REM XXXXXXXXXXXXXXXXXXXXXXXX
20 SYS 1031
30 PRINT "THAT'S ALL"
```

Line 10 should contain 25 X's—count them to make sure they are right. Now: a special number for line 20: for all PETs, 1031 is the correct number as shown. For VICs, the line should read SYS 4103, and on the Commodore 64 the line should be SYS 2055. Type in the correct value, complete the program, and list it back to be sure it's right.

The number you have typed in line 20 isn't a mystery—it's the address of part of the program itself. In fact, it's the address of the first of the X's that you typed in. We're going to check that to make sure everything is right.

Type in the following direct statement, using the number from line 20:

```
A=1031 (or 4103, or 2055, as appropriate)
```

Now we'll check that everything is OK by typing:

```
PRINT PEEK(A); PEEK(A+23)
```

The computer should print two numbers, both of which are 88. What does this mean? That's how the letter X is held in the computer's memory... we're checking to see that we have the X's in the right place.

Putting in the program.

Now, here's the gimmick: we're going to fit a machine language program right inside a line of BASIC! We'll POKE it into place, byte by byte, and we'll use the value of A that was previously set. Type the following lines carefully:

POKE A,32	POKE A+9,16
POKE A+1,228	POKE A+10,32
POKE A+2,255	POKE A+11,210
POKE A+3,201	POKE A+12,255
POKE A+4,13	POKE A+13,202
POKE A+5,208	POKE A+14,208
POKE A+6,1	POKE A+15,250
POKE A+7,96	POKE A+16,240
POKE A+8,162	POKE A+17,238

Whew! That's it, but we'd better make one more check to be sure we have put it in OK. Type: T=0;For J=A TO A+17:T=T+PEEK(J):NEXT J:PRINT T and the machine should reply with value 2847, which shows that you didn't make any mistakes.

You may LIST your BASIC program again now... but there's an amazing change. Most of the X's have disappeared, and in their place is an astounding hodgepodge of stuff. Don't worry about it—that's where we have been POKE-ing about. It looks like a mess to us, but to BASIC it's just a REM—a remarks line of no particular interest.

Running it.

Type RUN, and the program will start. Nothing will seem to happen, but touch a key and—pow—the key is repeated sixteen times on the screen. Talk about speed typing!

You may terminate the program by pressing the RETURN key—the machine language program is looking for this key and will quit when it sees it. Before you stop things, you might note another interesting thing: machine language ignores the RUN/STOP key unless special arrangements are made to check it.

If by any chance the program does not work, there must be a mistake somewhere. Turn the computer off and back on again. No harm has been done; but you'll have to start all over.

How it works (Part 1).

We placed a machine language program inside a BASIC REM line. BASIC, of course, ignores everything inside a REM line, so it wasn't bothered... it proceeded to line 20.

Line 20 contained a SYS command. That's like a subroutine call: it's very much like GOSUB. GOSUB tells you to go to a BASIC subroutine, which will contain a RETURN statement when it's finished. SYS tells you to go to a machine language subroutine, which will give its own kind of return statement (called an RTS instruction).

So we go to the machine language subroutine—tucked inside the REM statement—do whatever it says, and eventually return to BASIC which finishes the job.

How it works (Part 2).

You don't need to know this kind of detail, but for serious students I'll give a detailed rundown on what the machine language program is up to. I'll show the POKE values; then I'll show the same numbers using a special numbering system called "hexadecimal" which machine language programmers use; and finally, a brief explanation of each instruction.

32 228 255	20 E4 FF	Get from keyboard.
201 13	C9 0D	If it's a RETURN key. . .
208 1	D0 01	. . . skip next line;
96	60	Return to BASIC
162 16	A2 10	Set X count to 16
32 210 255	20 D2 FF	Print the character;
202	CA	Count down X
208 250	D0 FA	If more, back to PRINT
240 238	F0 EE	If not, back to start

It's not as legible as BASIC, but you can see that it has the same kind of clear logical structure that we use in BASIC.

If you can find the location where you placed the 16, you can try higher numbers there (maximum 255). Careful: variable A will have lost its value, so you must reset it or calculate the location yourself. To be sure, PEEK before you POKE.

Summary.

It's quite compact for some jobs: the whole Machine Language program fits inside a line of BASIC.

It's amazingly fast: BASIC couldn't print at that speed.


Perhaps most useful of all: Machine Language can give you a glimpse of the inner workings of your computer.

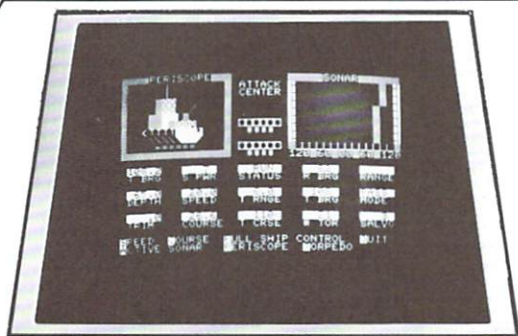
USER HINTS (continued from page 6)

(KEY 8) F8—CHRS(F8—STEP (ret)
CTRL	
(KEY 9) F1—EDIT (ret)	F1—PROG (ret)
(KEY 10) F3—GOSUB	F3—RENUMBER
(KEY 11) F5—RETURN	F5—MERGE
(KEY 12) F7—STR\$(F7—OFF (ret)

I myself find that the program mode key assignments are not the most convenient. Since this depends on the program, though, the capability to re-define the keys helps a lot. For instance, for programs that use the printer, I would place PRINT#4, as KEY 3, and get rid of the little-used RUN command. After the program is entered, then I would naturally go into the EDIT key assignments to debug it.

Last, but not least, the cartridge gives a lot of freedom in listing a program and using the full screen editor. The following control sequences are implemented:

CTRL A—Scroll down a program listing
 CTRL E—Cancels quote and insert modes
 CTRL L—Erase character after cursor on same line.
 CTRL N—Erase all characters after cursor
 CTRL Q—Scroll up a program listing
 CTRL U—Erase all characters on cursor line 



SUBMARINE WARFARE

- CONTROL NUCLEAR SUBMARINE IN CHALLENGING SIMULATION
- SAIL FROM PORT, DIVE, ATTACK, SINK SHIP OR BE SUNK
- SOUND AND GRAPHICS
- SUBMARINE COMMANDER TRAINING PROGRAM INCLUDED
- REQUIRES 16K; CBM 2000,4000, or 8000 with 4040 or 8050 or tape; or new model 64 tape or diskette
- USERS MANUAL available separately for \$4.75 and may be credited to price of \$29.95 for tape, and \$4.00 more for diskette
- AVAILABLE FROM
 Virginia Micro Systems 703-491-6502
 13646 Jefferson Davis Highway
 Woodbridge, Virginia 22191

A product of CLOCKWORK COMPUTERS, INC.
 Retailer and restaurant packages also available

WUNDERWARE

FOR YOUR VIC-20. SEND FOR GAME CATALOG AND FOR INFORMATION ABOUT COMMODORE 64 PROGRAMS.

KILLER CATERPILLAR! Here he comes...the dreaded Killer Caterpillar! He's weaving his way through the mushrooms trying to get to you. You can't let him through! If that isn't enough, you occasionally get visits from crazed spiders leaving a trail of mushrooms behind. Shoot them for extra points. Great graphics. For 5K VIC 20, requires joystick. Cassette \$9.95, Disk \$12.95

MAD PAINTER! This game is a little unique and a lot of fun. You control a paint brush, moving it around a colorful maze. Your job is to paint the entire maze. This is not as easy as it sounds, because in the maze with you are two voracious Bristle Biters (they love paint brushes). Occasionally you will receive a visit from an Invisible Stomper who leaves footprints in your fresh paint. Requires joystick. Cassette \$9.95, Disk \$12.95

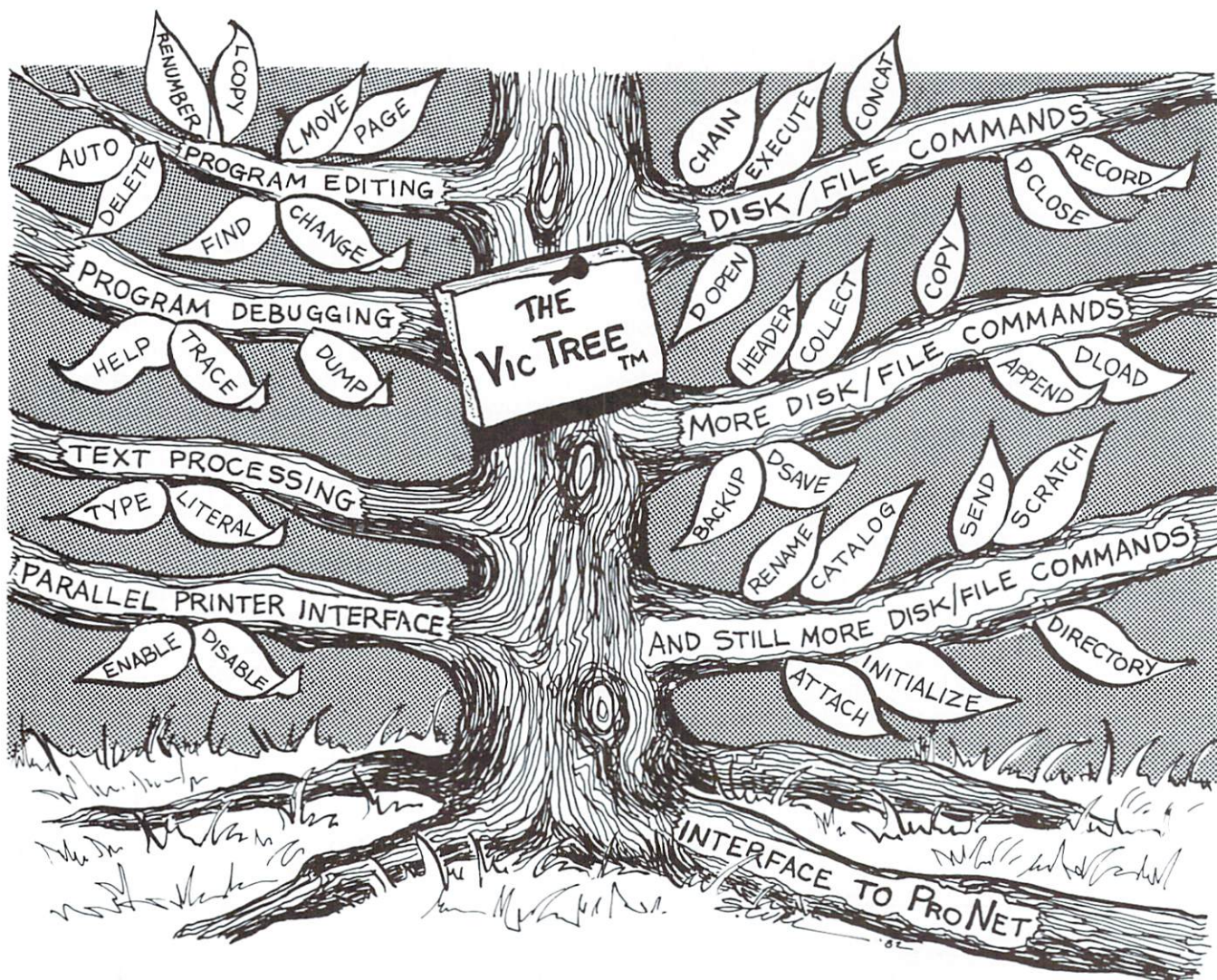
SNAKE! A fast and fun action game for one player. You're a big snake roaming around the screen. Mice, rabbits, eggs, and feet appear at random. Your mission in life is to bite these targets. You have to be quick—the targets don't stay for long. The main problem is: you always seem to be running into the wall or into yourself (the longer you play, the longer, and harder to avoid your own tail)! Snake! Keeps high score and requires a joystick. Cassette \$9.95, Disk \$12.95

■ Price includes postage & handling. ■ Catalog is included with order. ■ Foreign orders & COD's, please add \$3.00. ■ Prices are subject to change without notice.

■ At your dealer or send check or money order to:
WUNDERWARE, P.O. Box 1287, Jacksonville, OR 97530 ☎503-899-7549.

VIC-20 is a registered trademark of Commodore Business Machines.

Skyles Electric Works Presents



The VicTree™

...Leaves your new Vic (or CBM 64) with 35 additional commands.

...Branches out to most BASIC 4.0 programs.

...Roots into most printers.

New from Skyles: the VicTree, a coordinated hardware and software package that allows your Vic to branch out in unbelievable directions and makes it easier than ever to do BASIC programming, debugging and to access your disk. And the new VicTree provides routines to interface the Vic to the powerful ProNet local network. 8kb of ROM — 4kb for the BASIC commands, 4kb for disk commands and interfacing to ProNet — plus 4kb of RAM for miscellaneous storage. Perfect not only for the new Vic but also for the Commodore 64. Unbelievably simple to use and to install, the VicTree gives you all the additional BASIC 4.0 commands to allow most BASIC 4.0 programs to work on your new Vic or CBM 64.

Now only \$89.95...or \$99.95 complete with Centronics standard printer cable. (Cable alone \$19.95.) Available now from your local dealer or order through your Visa or MasterCard toll free: (800) 227-9998 (California, Canada, Alaska, Hawaii: (415) 965-1735) or send check or money order directly to:



Skyles Electric Works

231E South Whisman Road
Mountain View, CA 94041
(415) 965-1735

TWO VIC20 PERSONAL COMPUTER

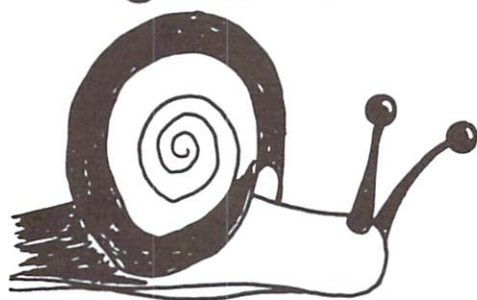
TOP SELLING

ARCADE GAMES!!



—PLUS

(Bugs all over!!)



This game is literally full of bugs. We guarantee hours of exciting entertainment trying to remove them. Bugs you will come up against are spiders, snails, fleas, and centipedes in this rapid fire, 100% machine language, great graphics, exceptional quality game. Our highest recommendation runs in standard 5K VIC!

**10 DAY FREE TRIAL—BECAUSE
WE LOVE OUR CUSTOMERS!**

EXTERMINATOR—PLUS
LIST PRICE \$24.95 SALE PRICE \$19.95



NUCLEAR DISASTER!



NUCLEAR DISASTER!

A more dastardly alien could scarce be found than one who would wipe out an entire civilization by dropping anti-matter anti-cannisters, right? If your opinion of this alien trouble maker is the same as ours, probably your first thought was, get some matter! We say calm down! All is not lost. A mobile rapid splatter cannon capable of both breaking through his standard alien moving force fields and laying waste to the every increasing number of anti-cannisters is even now hovering above us. If only our cannoneer hadn't called in sick . . . say, what are you doing today? This is a must for VIC-20 owners.

Anti-Matter Splatter is 100% machine language and runs in standard 5K VIC.

**10 DAY FREE TRIAL—BECAUSE
WE LOVE OUR CUSTOMERS!**

ANTI-MATTER SPLATTER
LIST PRICE \$24.95 SALE PRICE \$19.95



**we are
commodore VIC
experts!!**

**PROTECTO
ENTERPRIZES** (FACTORY-DIRECT)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

Tele/Scope

Do You Know Your M.Q. (Modem Quotient)?

A Telecommunications I.Q. Test

by Jeff Hand



This short test will gauge how much of a general understanding you have of telecommunications. We originally planned to hire a staff of psychologists and educators to create the test, but they didn't want to work for peanuts. Therefore, I made up the questions a day after this magazine went to press (a tribute to my keen instinct for timing). This test is similar in nature to the popular psychological inventory tests seen in many popular magazines. The difference is the psych tests are meaningful. They probe and gauge such poignant personality traits as shyness, aggression, fear of flying, and the test we all fear: are you a jerk? This telecommunications test will not solve your marital problems, but I think it is a lot of fun to see how much you know. Don't feel bad if you don't do too well; the only reason I knew the answers is because I had the books in front of me.

1. What's baud rate?
 - a) The number of bad jokes per minute in a night club act.
 - b) Speed at which bits of information are sent over the phone lines per second.
 - c) The speed at which Mae West walked across the screen.
 - d) Electron flow across a pnp junction.
2. Describe full duplex.
 - a) Both apartments are rented out for the rest of the year.
 - b) A psychological condition in which the person is terrified of anything that comes in pairs.
 - c) Simultaneous transmission and reception of data on the same phone line.
3. What are Bell 212 protocols for?
 - a) When speaking to foreign diplomats it's the proper etiquette to use — money.
 - b) Proper genuflecting for paying your phone bill.
 - c) A code for marking up all services at least 212 percent.
 - d) Transmitting information across phone lines at 1200 baud.
4. What does a computer network consist of?
 - a) Processors (host)
 - b) Network nodes (switches)
 - c) Communication links (transmission lines)
 - d) All of the above
5. How much time do you spend on CompuServe, accessing Commodore's Information Magazine?
 - a) 0 minutes (better get on there quick if you want to pass this test)
 - b) 1 hour
 - c) 2 hours
 - d) 3 hours or more
6. What does the word modem stand for?
 - a) "Mo" is for modulate and "dem" is for demodulate.
 - b) A new punk rock band.
 - c) Diskette in Albanian
 - d) Partial slogan for a lawn care business: "Modem weeds".
7. Describe Frequency Shift Keying (FSK).
 - a) Number of times the car keys are lost in a year.
 - b) Technique for sending morse code.
 - c) Method of modulating a carrier frequency. A binary one shifts the frequency above the center carrier frequency. On the other hand, a zero shifts the frequency below the center carrier frequency.
 - d) Interface device for the CBM user port.
8. Which of the following best describes the uses of a computer network?
 - a) Electronic mail
 - b) Database access
 - c) Teleconferencing
 - d) All of the above
9. What are the two major components of a network?
 - a) Prime time shows and good actors.
 - b) User subnetwork (host, terminal controllers, and terminals) and Communication subnetwork (network nodes, communication links).
 - c) Good underground connections and money.
 - d) Howard Cosell and Dan Rather.
- 10) Name the three methods that links can communicate by.
 - a) Simplex, Half Duplex, and Full Duplex.
 - b) Phone, letter, and Western Union.
 - c) Jimmy Dean, Bob Evans and Hickory Farms
 - d) Binding arbitration, impartial mediator, and a lawyer.
- 11) What are Bell Telephone's 103 protocols for?
 - a) Transmission of information at a 300 baud rate or less.
 - b) Rules for getting a new telephone installed.
 - c) A regulatory action taken by Alexander Bell before going to bed.
 - d) A new set of rules that developed from the 102 protocols.
- 12) Describe a network node.
 - a) Similar to a nerd but not as severe.
 - b) President of NBC.
 - c) Messages are broken down into packets.
 - d) Switching station for several communication links usually controlled by a microcomputer or a minicomputer depending on the complexity of the links.

- 13) What's an integrated network?
- The information is bussed across town to another node.
 - Capable of communicating voice and data information, including point-to-point networks and broadcast networks.
 - Algorithm for link switching.
 - A totally actualized computer network that has reached the top of Maslow's pyramid.
- 14) What are protocols?
- Algorithm or rules for transfer of information.
 - Rules for eating chicken and peas at a formal dinner party.
 - Proper method for calling pigs at the state fair.
 - All of the above.
- 15) What are stop bits?
- The last bits in your computer's memory.
 - A signal to the computer to stop transmission.
 - A blank bit(s) sent after each character to signal the end of that character.
 - The metal bar put into a horse's mouth to make him stop.
- 16) Describe parity.
- Equal amount of time for each computer.
 - Menu driven database.
 - Anything that comes in pairs.
 - Some computers check for transmission errors by setting the highest bit in each character in a certain way. In even parity, the total number of one bits in each character should always be an even number; in odd parity, the number of one bits is odd.
- 17) What's the name of the terminal software package for the VIC-20?
- VICTERM I
 - Terminal Program I
 - Mc Term
 - All of the above.
- 18) What's ASCII?
- A New Englander talking about skiing.
 - Sound of a person sneezing.
 - American Standard Code for Information Interchange.
 - All of the above (I'm running out of answers).
- 19) Describe Videotext.
- A new competitor in the home video market.
 - A cover-all term used to include both broadcast teletext and telephone transmission systems. CompuServe is of the latter variety.
 - The major reference work for the video industry.
 - Conversion of numeric data into video images.
- 20) What's Telidon?
- A relative to the African elephant that has been extinct for a hundred thousand years.
 - A new video game from Japan.
 - Voice response technology.
 - Standard for transmitting graphics over the phone lines to another computer, using alpha geometrics. The system is being utilized in the U.S. and Canada.

- 21) What are the different levels of Telidon?
- alpha mosaic
 - alpha geometric
 - alpha photographic
 - All of the above.
- 22) What is asynchronous communications?
- A method of transmitting data in which the timing of characters on the transmission lines is not important. Characters are preceded by a start bit and a stop bit which allows intervals between characters to vary.
 - A discussion with your mother-in-law.
 - Sending characters across transmission lines where timing is critical.
 - Satellite transmission to earth stations.
- 23) Lilly Tomlin plays a snooty telephone operator, that we have all met at one time or another. For the extremely advanced telecommunications nut, name that character.
- Maude
 - Geraldine
 - Ernestine
 - Gertrude

Here is the answer key:

1-b	13-b
2-c	14-a
3-d	15-c
4-d	16-d
5-any	17-a
6-a	18-c
7-c	19-b
8-d	20-d
9-b	21-d
10-a	22-a
11-a	23-c

Give yourself one point for each correct answer.

If you scored between 0-10 take heart; we'll get you a telecommunications position with one of our competitors.

10-15 You're an up-and-coming telecommunications expert. You'll have to spend more time on CompuServe and Commodore's Information Network to bring your score up to par though.

15-20 Very Good. You're almost there; if you push a little harder you might make it all the way.

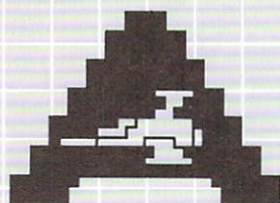
20-23 You're a fanatic and a Netwit (network wit)! Your monthly connect-time bill probably runs into hundreds of dollars. Your family probably hasn't seen you for several days, and when they do you're a disheveled wreck with a distant look in your bloodshot eyes, and a blank CRT expression on your face. Your fingers are itching to get back to the keyboard. You yearn for the great wideopen computer network with unlimited memory, more power and where seldom is heard a discouraging word. I recommend you seek help from Computerists Anonymous.

In the coming issues of Commodore's magazines this column will lower the nonsense-to-information ratio and cover technical topics on modems, computer networking and telecommunications. Stay tuned! 

TODAY'S MENU

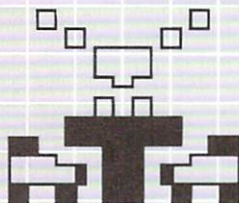
For Your VIC 20™

Games



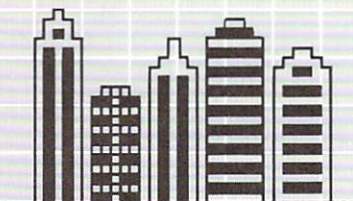
ASTROBLITZ

Protect your planet by destroying enemy saucers.



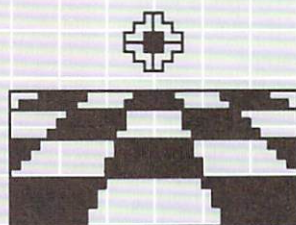
TRASHMAN

Drive the garbage truck and empty the city's trash cans. But watch out for the flies.



CITY BOMBER

Level a city to make it easy to land. Take off and do it again.



ACTION GAMES

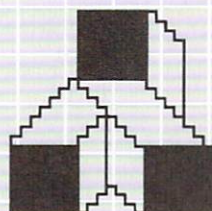
SEAWOLF, BOUNCEOUT, or VIC TRAP. You'll need sharp eyes and quick hands for these.

Education



EDUCATIONAL/RECREATIONAL (I & II)

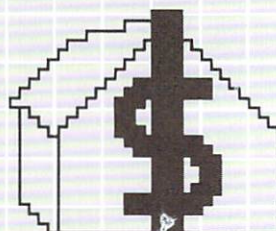
Put fun into learning math, spelling, and spatial relationships.



LOGIC GAMES

The computer is thinking. You should be, too.

Personal



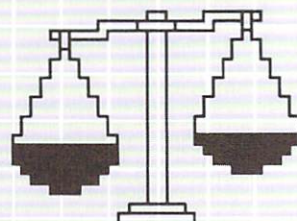
HOUSEHOLD FINANCE

Schedule the family budget, account for expenditures, and face the tax man with a smile.



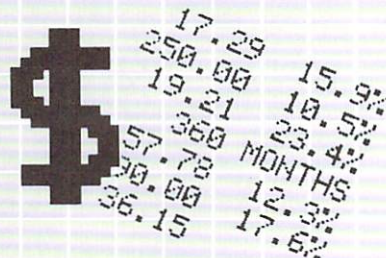
HOME INVENTORY

Make a record of what you own and revise it as you go. Find out what you've got in seconds.



DECISION MAKER

What should you do about virtually anything? Here's help.



LOAN ANALYZER

Home, car, boat ... whatever. How much can you afford? Find out.

Choose an Entree:

Maybe it's a colorful and challenging game like ASTROBLITZ, TRASHMAN, or CITY BOMBER; perhaps an educational game like HANGMAN or MATH HURDLER; maybe a basic diet of household concerns like HOME INVENTORY, HOUSEHOLD FINANCE, or DECISION MAKER.

Take your pick. All you have to supply is your VIC™ 20 and your own ideas about how to put our software to use. We supply the rest: competitive games, educational games, down-to-earth personal programs, and simple instructions that make everything easy to digest.

What you see here is part of the menu for today. We'll be adding more, so check our menu from time to time. It's growing, and it's all take home.

Contact your local outlet.



201 San Antonio Circle, Mountain View, CA 94040 U.S.A. (415) 948-9595

New Products

Company: Cardco, Inc.
812 S. Lightner
Wichita, KS 67218

Product:

Cardboard/3 Economy Expansion Interface (Motherboard) for the VIC 20—The Cardboard/3 is an expansion interface that gives users access to more than one memory or utility cartridge. It will accept up to three RAM or ROM cartridges at one time. Uses T.R.W. gold-plated connectors. Circuit board is made of aircraft industry-standard fiberglass/epoxy compound. Board is fused to prevent accidental damage to your VIC 20.

Price: \$29.95

Company: ECX Computer Company
2678 North Main Street
Walnut Creek, CA 94526

Product:

CX-6401 Serial Port Printer Interface—Allows the VIC 20 or Commodore 64 to use any type of standard parallel interface printer. The interface connects to the serial port/bus, not the user port, so the user port remains open for use by a modem or RS-232C peripheral device. Comes standard with a six-foot serial bus cable and connector for direct connection to the computer and a one-foot parallel cable for connection to the printer.

Price: \$89.95

Product:

CX-6402 RS-232C Full Serial Interface—Allows the VIC 20 or Commodore 64 to use any type of RS-232C serial interface: printers, modems, etc. Connects to the user port. The CX-6402 is a complete RS-232C interface with all the features and levels required to interface all RS-232C devices. It allows full use of all eight active handshaking RS-232C signal lines on the computer. Comes ready to use with a six-foot parallel cable for connection to a printer. Does not require an external RS-232C cable.

Price: \$59.95

Company: TOTL Software
P.O. Box 4742
Walnut Creek, CA 94596

Product:

TOTL Time Manager 2.0—For the VIC 20 with 8K expansion and printer; on cassette or disk. A set of two programs that allow you to create personal or business schedules, calendars of events and checklists of activities. Includes 56 different bar chart formats. You enter

a description of each activity, the person responsible, project code, date, time and comments.

Price: \$25.00

Product:

Research Assistant 2.0—For the VIC 20 with 8K expansion and printer; on cassette or disk. A set of programs that allow you to keep track of reference data and create keyword cross-reference lists. Keep data on reference sources: author, title, bibliography. Keep reference notes: page(s), text, up to 12 keywords, date(s). Create sorted keyword cross reference. Print data and/or cross-reference lists.

Price: \$25.00

Product:

TOTL Text, Basic or Enhanced—Word processor for the VIC 20 with 8K expansion and printer; on cassette or disk. A complete word processing program for creation of professional documents. There is no limit to the length of the document, since it can be created in sections, saved, then printed in sequence. Basic version includes standard word processing features. Enhanced version adds footing line at bottom of the page, footnotes, right margin justification and more.

Price: Basic version — \$25.00

Enhanced version — \$35.00

COMMODORE USERS

Join the largest, active Commodore users group in North America and get—

- Access to club library of over 3000 free programs.
- Informative club newsletter.
- The latest information about the PET, CBM, VIC, SuperPET and Commodore-64.

Send \$20.00 (\$30.00 overseas) for Associate Membership to:

Toronto Pet Users Group

Department "P"

381 Lawrence Avenue West

Toronto, Ontario, Canada M5M 1B9

Getting Acquainted With Your VIC 20: More Than 50 Programs

by Tim Hartnell, Creative Computing Press, 132 pages (paperback), \$8.95

by John O'Brien

This book was originally reviewed back in the December, 1981, issue of *Commodore Magazine*. We are giving the revised edition a second chance for the benefit of *Power/Play* readers.

Neil Harris, the reviewer in *Commodore*, gave it a lukewarm rating. He felt that although the idea behind the book was good (to provide education in program techniques along with games and random number exercises), it had far too many problems. The main problems, according to that first review, were that the programs weren't that great, some didn't even work, and that the book seemed as if it were originally written for another computer because it has commands that don't even apply to the VIC such as "enter" and "newline".

Even in the revised edition, some problems still exist. For instance, on at least one occasion the author still uses the word "enter." Also, most of the programs are still not terribly exciting, and are more useful for their teaching value than their game-playing fun. The "Star Trek" game is a good example of this.


Despite these problems I give this book a higher rating than it was given previously, even at the risk of disagreeing with my boss. First of all, the programs have been fixed. I feel the book is fairly good if you keep in mind its limitations. For example, if you think of this book as a textbook to learn BASIC you will be disappointed. It is not "Everything that you always wanted to know about BASIC, but were afraid to ask." And if you are already writing fairly sophisticated programs this book will be too easy for you.

However, it is good if you've just barely outgrown the VIC users guide and hunger for more knowledge. There are, of course, other sources for this kind of information, but used as a supplement with other sources it will help pound VIC BASIC into your skull. If you are like me, then you need all the pounding you can get.

I also enjoyed the teaching method used by Hartnell. The book will give you a program to try out. When you try it out you usually find that the program is lacking something. Then it is explained how you can make the program better. The annotation will point out (if you haven't guessed already) what is missing and how to fix it. After awhile the author won't show you how to fix it, since you should be able to do it

for yourself by that point. In direct contrast to Commodore's "An Introduction to BASIC" the author doesn't recommend using flow charts. Not being a serious programmer, I'm not sure which method is best. You'll have to figure that out for yourself.

As for the programs not being great, that may be true but I found some that are worthwhile, such as "Labyrinth." Plus, as you learn more BASIC, you can expand and change the core of these programs on your own to put in the things that will make them better.

This book is not for everyone. If you know too much or too little it is not for you. If you have a large software library it may also not be for you. But, for those certain people who don't fit in any of those categories, I give the book a guarded recommendation. Just make sure and keep the limitations in mind before you shell out \$8.95. 

Best Books

VIC BASIC: A User-Friendly Guide. Zamora, Inman, Albrecht & Dymax: Reston Publishing

VIC Games and Recreations: Adventures with the Rainbow Machine. Zamora, Kunkin & Dymax: Reston Publishing

Start with BASIC on the Commodore VIC 20. Monro & Tidy: Reston Publishing

Armchair BASIC. Annie & David Fox: Osborne/McGraw Hill

Fundamentals of Programming in BASIC. Robert C. Nickerson: Little, Brown and Company

Computer Programming for the Complete Idiot. Donald McCunn: Design Enterprises of San Francisco

The First Book of Microcomputers. Robert Moody: Hayden Book Company

The Computer Tutor. Gary W. Orwig & William S. Hodges: Winthrop Publishers, Inc.

Commodore's BASIC Programming -Part II

by Mike Heck

For those of you who completed Part I of this easy-to-follow introductory course on BASIC for the VIC 20 and are ready to expand your understanding of the language—or those who just want to learn more—this second offering won't disappoint you. If you feel ready for new, and perhaps more difficult, challenges—settle down for some long, but enjoyable sojourns with your VIC 20.

The course follows the same format and design established in Part I: a well thought-out and illustrated book broken down into 10 units plus several appendices. Accompanying the course are two cassette tapes with many examples for you to try and work with. The tapes also contain a number of useful "utility" programs that help tremendously in designing your own programs, such as sort routines.

As with Part I, author Andrew Colin places the emphasis on teaching by example and doing, rather than just reading. And the examples present everyday problems and solutions that can be put to use by just about anyone.

But to get the most out of the course, especially as the units get more complex, it's important to remember that time is the critical element. Study each unit in detail, complete the practical problems given, and be patient, as some of the later units may take four or five days to absorb. It is also important to understand one unit before proceeding to the next because the new unit will build on past concepts. If you are having trouble with a section, go back and read it again. In most cases the concepts will become clear through studying the straightforward examples and descriptions.

Part II begins with a description of DATA and READ statements and how they can simplify programming by allowing you to write generalized programs and just change the DATA lines for each new problem. A great example shows how to calculate the most efficient way to break down a sum of money into the least number of bills and coins, using British currency. The reader is left to figure out how to modify one program DATA line to handle U.S. currency. A simple example that gets its message home in an understandable and direct way.

A number of units deal with program logic, writing more efficient programs, and how the VIC 20 behaves in unexpected ways. For example, an effective way to limit a program size is to put multiple statements on a line, but there's a catch. You can't jump to a statement in the center of the line and IF...THEN logic might not act logically! If that doesn't make sense it will after you complete the logic unit.

Subroutines are another advanced area that

demand special attention. Their correct use will increase the efficiency of a program many times. In this unit you gain confidence in writing subroutines and building larger programs from smaller modules.

Even more than the information presented, the most impressive thing that is woven throughout the course is the emphasis on good programming practices, something that is lacking in many commercial programs. Good documentation and error checking are stressed from the start. You'll never find an example that "crashes" or gives questionable results.

Arrays are another sometimes difficult concept presented in a useful and entertaining way, ending with the reader designing a program to access phone numbers stored with corresponding names in a two-dimensional array.

One of the more interesting areas covered involves sorting elements into either alphabetic or numeric order. The "bubble sort" and "quicksort" routines should be of interest to all, including experienced programmers. Other topics include just about everything you might want to know about the VIC and BASIC, from logical operators to memory maps and a music tutorial that rivals many dedicated music texts.

As a tribute to its completeness, certain information in the course is seldom available elsewhere, such as the ASCII codes for each key in any of four modes. And this is invaluable for serious programming. Ever need to know what a "Commodore Shift" 8 is (holding the Commodore key and 8 key)? Answer: 40.

After the study and work is over, the author presents a number of his original games that make extensive use of the programming techniques introduced throughout the course. Relax and have some fun.

The only minor irritation is that the text was reprinted unchanged from the original designed for U.K. distribution. As a result, some may find a few examples hard to follow, such as one explaining game scoring, using Cricket as the example.

But not taking anything from an excellent job, when you complete the course you will have been introduced to almost everything there is to know about BASIC and will be able to appreciate and put to use the immense power of the computer with your new skills. 

Command-O or Command-O-Pro?

It's called the Command-O-Pro in Europe, Command-O in the U.S.

But whatever you call it, this 4K byte ROM will provide your CBM BASIC 4.0 (4016, 4032) and 8032 computers with 20 additional commands including 10 Toolkit programs for editing and debugging, formatting and disk file manipulating. (And our technical writer dug up 29 additional commands in the course of doing a 76-page manual!)

Extends Commodore's 8032 advanced screen editing features to the ultimate. **SCROLL** up and down, insert or delete entire lines, select **TEXT** or **GRAPHICS** mode or ring the PET's bell. Redefine the characters to the left or right and position on your screen. And define any key to equal a sequence of up to 90 key strokes.

Resides in hexadecimal address \$9000, the rightmost empty socket in 4016 and 4032 or the rear-most in 8032. If space conflicts, Socket-2ME or GO-4IT available at a very special price.

Command-O from Skyles Electric Works
Complete with Socket-2ME (2 sockets)
Complete with GO-4IT (4 sockets)

\$ 75.00
90.00
105.00

Disk-O-Pro ROM:

25 new commands at \$75.00, that's only \$3.00 a command!

The powerful chip for all "classic" PETs. In any PET with Version III (BASIC 2.0) ROMs (### COMMODORE BASIC ###) Disk-O-Pro will give 19 software compatible disk instructions: 15 identical with the new BASIC 4.0 (or with 8032 ROMs) compatible with both old and new DOS. Plus 4 additional disk commands...including program appending (**MERGE**), program overlaying output of strings and **PRINT USING**, allowing formatting output of strings and numbers on the PET screen or on any printer.

*NOTE: Old DOS doesn't recognize 3 commands. Plus softtouch key (**SET**) which allows you to define a key to equal a sequence of up to 80 keystrokes. **SCROLL** whereby all keys repeat as well as slow scrolling and extra editing features, **BEEP** which allows you to play music on your PET.

Completely compatible with the BASIC Programmer's Toolkit. (The chip resides in the socket at hexadecimal address \$9000, the rightmost empty socket in most PETs.) And for the owners of "classic" (or old) PETs, we do have interface boards.

(For those owning a BASIC 4.0 or 8032, even though the Disk-O-Pro may not be suitable, the Command-O is. We have never abandoned a PET owner.)

Complete with 84-page manual written by Greg Yob.
Disk-O-Pro from Skyles Electric Works
Complete with Interface Board (for "Classic" PETs)

\$75.00
90.00

Note: For full dot resolution graphics, see GRAPHIX page 6.

WORD-WRITER

Add this one small device and greatly increase the power of your 8032, 8096 or SuperPet.

This one small device of your Commodore Business Machine, the usefulness of your Commodore Business Machine.

Open your CBM computer and place this modern wonder chip in the rear empty socket (UD11). Close the lid and turn on your CBM with **WORD-WRITER** a built-in word processing system. Type "SYS36864," "RVS," key and "L" for letter. That is all there is to it—no diskettes or tapes to hassle with. Start writing! You never knew a word processor could be so easy to use. Make a mistake? **No problem**, cursor to the front of the offending word. "RVS" key "G" key and "I" (for insert) and type in the correct word or phrase. You only want to change a letter, or a line? **No problem**, a couple simple key strokes will do it.

Want to move or copy a line or paragraph? Want to insert something? **No problem**, a few simple practical key strokes and it is done.

Do most of your letters and reports have standard paragraphs in them? **No problem**, write them once save them on disk or cassette and use them thousands of times with only a few keystrokes of typing for each paragraph.

Have a lengthy report, memo or letter to write? **No problem**, **WORD-WRITER** holds up to 15—count them—15 pages of text at one time.

Want to search, scroll, skip, flip or jump through the text? **No problem**, a couple of keystrokes and you are on your way.

What about typing out or printing the text? **No problem**, a few keystrokes and you can print out a rough draft or final copy on whatever printer you have attached to your PET/CBM.

For CBM 8032, 8096 or SuperPet SP9000
WORD-WRITER

Please specify your PET/CBM model when ordering.

\$85.00

"The PET with the new PicChip...is like home movies."

The new ROM that took Europe by storm is available only from Skyles Electric Works in the U.S. and Canada. PicChip, a ROM extension of the BASIC Version III (BASIC 2), BASIC 4.0 or BASIC 8032 interpreter. Over 40 commands that allow you to create programs with dynamic graphics displays: plots, bar graphs, pictures, and rolling, scrolling, shifting and inverting. All instantly and easily added to your BASIC program.

The address for the 2000/3000 (which would require PicChip module PC2), for the 4000 (PC4) and for the 8000 (PC8) is \$A000...unless you have a Mikro, Word Pro 3 or 4, or Jinsam, which occupy that same address. In those cases, you will need the PicChip on an interface multi-socket board. In all cases, the Mikro, WordPro or SORTS would be switchable manually using the Skyles Socket-2ME or GO-4IT available at a very special price.

PicChip from Skyles Electric Works
Complete with Socket-2ME (2 sockets)
Complete with GO-4IT (4 sockets)

\$60.00
\$75.00
90.00

Skyles Catalogue Page 1

For PET and CBM 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 8½ x 10 splendor, and another 19 pages of peripherals, software and books that will make your PET or CBM 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**).



Skyles Electric Works
231-E S. Whisman Road
Mountain View, California 94041

No More Pencils, No More Books...

How Captain Zurgle Saved His Ship With Commodore's Visible Solar System Cartridge and Learned About Home Babysitter, Too

by Ned Horn

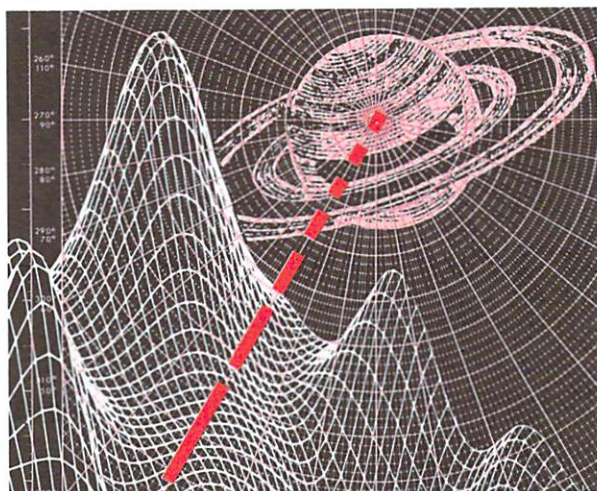


Illustration by Jeff Gernsheimer

CAPTAIN ZURGLE! SIR!

The captain raised one weathered tenacle from his framistan, giving his cabinboy a stare that would wither a Sirian Womp-Rat.

"Yes, Higly, what is it this time?"

"Well Sir... Your pet Brain-Parasite got loose. It... it seems to have eaten some of the computer's data banks."

"WHAT!"

"It also seems to have eaten the First Mate."

The Captain's underface, normally a calm bright red, turned a frightening shade of pink.

"WHICH DATA BANKS!"

"That's the real problem sir. It ate all the astronomical charts."

The cabinboy fully expected to see his captain molt in anger. To his surprise, Captain Zurgle sighed in relief.

"Well, Higly, that's not as bad as I had expected."

"But sir, without that data how can we complete our mission?"

"Why, with a little help from the natives, of course."

Captain Zurgle turned his attention to a strange native artifact.

"That," said the captain, "Is a VIC. And this is VISIBLE SOLAR SYSTEM."

The captain inserted an oblong object into the VIC and turned it on.

"Observe, Higly! Here you see the planet Earth," A rotating spheroid appeared on the screen. "Earth is the home planet of the creatures who built this machine. At the top of the screen you can see its relation to the other planets that are visible from Earth. At bottom are its important statistics."

"But... can we visit other planets?"

"Of course. Here's Mars." A different planet appeared. "Observe the craters. And here's Jupiter, and finally Saturn."

"Are the real planets this attractive?"

"That's a matter of taste."

"But without our computer how will we know what our escape velocities should be? We might land on a planet and never leave!"

"Relax. VISIBLE SOLAR SYSTEM can compute our escape velocity for us. It will also tell us about the temperatures of the planets, and will even calculate our adjusted weight under different gravities. For example, on Earth a heavy guy like myself would weigh about six pounds, so on Jupiter I would weigh 15."

"Captain! Then you would weigh as much as the Supreme High Muckamuck himself."

"Ah! But on Jupiter the Muckamuck would weigh forty pounds."

"Too bad. But tell me, Captain, how will we be able to calculate our flight path?"

"Simple, Higly," Captain Zurgle pushed a button on the VIC. Suddenly Higly was looking down at the orbits of all the planets. He could watch the planets move at their actual relative velocities around the sun."

"That's fine if we're entering from the top of the solar system, but we came in at an angle."

"No problem. Look. By adjusting our starship coordinates we can see the planets in their orbits exactly as they might look from our ship's window."

"That's incredible, Captain. Why, we can go home and file our report right now. Tell me, what else did you find on Earth before we blew it up?"

"Something called a 'Home Baby Sitter'."

"What's that?"

"I don't know. Why don't we read the review and find out..."

HOME BABYSITTER

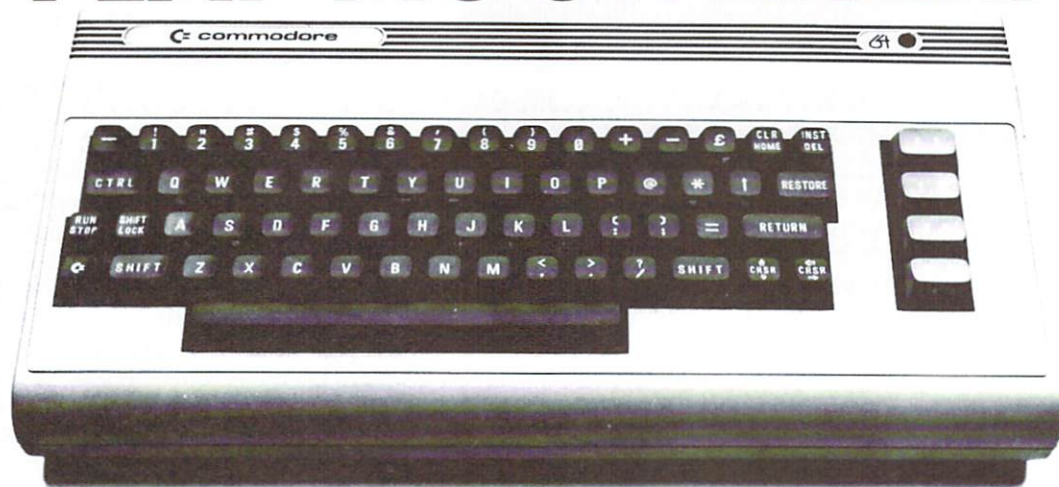
Anyone setting out to design educational software for the home today is faced with a difficult choice. Should the programmer emphasize solid, albeit boring, educational drills, or should the program be FUN, in big letters, and educational as an afterthought? Too little emphasis on entertainment can result in a product that kids would use only under parental supervision. Too much might sacrifice any real scholastic value.

HOME BABYSITTER skirts this issue by providing three separate programs in one cartridge. A simple "sing along" alphabet program teaches pre-schoolers their ABC's. A "counting" program provides solid drills in counting numbers up to 20. Both of these programs are ideally suited to classroom and parentally supervised situations.

Of course, most kids have an attention span of about 12 seconds. A "Face Maker" game is

(continued on page 66)

INTRODUCING THE PERSONAL COMPUTER THAT CAN RUN YOUR BUSINESS, REPEL AN INVASION FROM MARS AND PLAY "MOON RIVER."



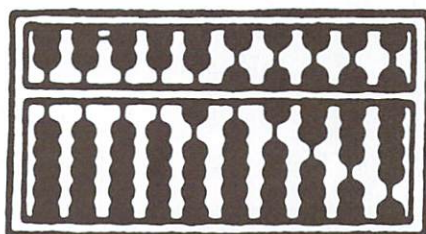
THE COMMODORE 64. ONLY \$595.

The Commodore 64™ gives you powerful memory (64K), computing, arcade-quality games and a quality music synthesizer. If you've been waiting for a personal with this kind of price and performance, your wait is over.

commodore
COMPUTER

Contact Your Nearest Commodore Dealer

**You
Can
COUNT**



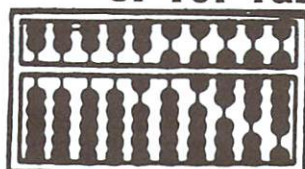
**On
Abacus
Software**

VIC * COMMODORE 64 * PET

- * **SPRITE-AID** for CBM-64 \$15 [\$20]
- * **SYNTHY-64** Music & Sound Synthesizer \$35 [\$40]
- GRAPHVICS** Super full-screen Vic graphics \$25 [\$30]
- VIC or PET VIGIL** games language W/9 games \$35 [\$40]
- VIC or PET PIPER-THE MUSIC MACHINE** \$25 [\$30]
- VIC HIRES/MULTICOLOR GRAPHICS UTILITIES** \$20 [\$25]
- TINY BASIC COMPILER** Vic, CBM-64 or Pet \$25 [\$30]
- * **VIC JOYSTICK PAINTER** \$15 [\$20]
- * **SUPER EXPANDER SCREEN DUMP** \$15 [\$20]
- I-CHING FOR VIC** \$30 [\$35]
- * **VIC TINY PILOT** \$25 [\$30]
- * **BUDGETEER** Vic, CBM-64 or Pet \$25 [\$30]
- BASIC REFERENCE CARD** \$2.50 [\$3.00]
- * **VIC MACHINE LANGUAGE GUIDE** \$7 [\$8]
- PET TINY Pascal PLUS** \$40 [\$45]
- PET MACHINE LANGUAGE GUIDE** \$9 [\$11]
- * = NEW

Look for Commodore 64 Software Coming SOON!

Write for our FREE Catalog
or for fast service, call our Order Line.



**Abacus
Software**



P.O. Box 7211, Grand Rapids, MI 49510

616/241-5510

FREE POSTAGE. Unless noted, prices are for cassette. Add \$3.00 per DISK package. Foreign prices in []. Manuals available separately for inspection, creditable towards purchase of software \$5.00 each [\$7.00 foreign]. All orders must be prepaid in U.S. Dollars via check or International Money order or by VISA, MC, ACCESS, Eurocard.

40-Column VIC — \$29.95!

But...there's a catch.

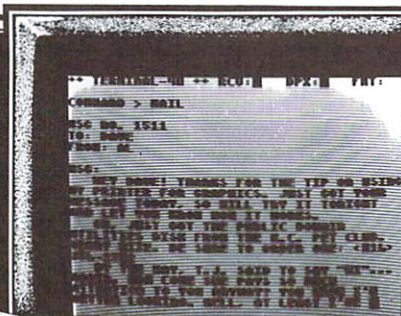
We found a way to transform your VIC screen into a 40-column, smooth scrolling text display. So we created *Terminal-40*, a program for communicating by modem with networks such as CompuServe and Source. It's inexpensive, powerful, and a pleasure to use.

But we created a problem, too. Now everyone wants *all* their programs in 40 columns. That's the catch. *Terminal-40* is only for telecommunications. Don't despair, though. You'll have the *finest* VIC terminal around.

So, plug in your modem and...



MODEM



REACH OUT and BYTE SOMEONE!

TERMINAL-40 . . . \$29.95

Requires 8K or larger memory expansion and modem. VIC printer optional. On cassette.



**MIDWEST
MICRO associates**

PO BOX 6148, KANSAS CITY, MO 64110

ORDER DESK: open 9 am - 4 pm.

(816) 254-9600

VISA/Mastercard add 3% (card # and exp. date)
C.O.D. add \$3.50

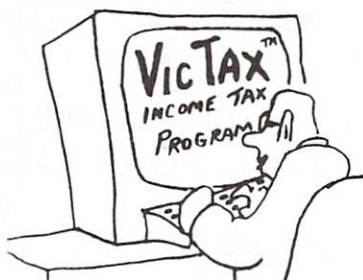
MAIL ORDER: Add \$1.25 shipping and handling. Missouri residents include 4.6% sales tax. Foreign orders add \$5 shipping and handling. Write for free brochure. Dealer inquiries invited.

VIC-TAX

VIC-TAX

VIC-TAX

VIC-TAX



USE **VicTax™** AND ANY **Vic®**
COMPUTER TO PREPARE
YOUR INCOME TAX RETURN

VicTax WILL RUN ON ANY Vic-20 COMPUTER

VicTax WILL SAVE TIME AND IMPROVE ACCURACY OF TAX PREPARATION

VicTax WAS DEVELOPED BY AN EXPERIENCED ACCOUNTING FIRM

VicTax IS USER FRIENDLY SOFTWARE WITH A DETAILED MANUAL

VicTax IS THE FINEST INCOME TAX SOFTWARE AVAILABLE FOR Vic-20

CASSETTE AND DETAILED INSTRUCTION MANUAL \$ 19.95

AVAILABLE FROM YOUR LOCAL DEALER OR FROM NORTHLAND ACCOUNTING

NORTHLAND ACCOUNTING, INC.
606 SECOND AVE.
TWO HARBORS, MN 55616



(218) 834-3600

VIC-TAX

VIC-TAX

VIC-TAX

VIC-TAX

Get Serious

What's happening on the POWERful side of Commodore products

In this issue we've touched on several of the fun-and-games capabilities of the Commodore 64. But, as we all know, underneath that fun-loving exterior beats the heart of a sophisticated computer with serious capabilities for business, educational, scientific and other highly technical applications. To meet the needs of all our 64 users—including those in education, business and science as well as those at home—Commodore is developing a variety of software packages we think you should know about.

These packages are now available from Commodore: **EasyFile**, a database that allows the user to define data, see how it looks on the screen, enter, retrieve and edit; **Word/Name Machine**, an entry-level word processor and name/address list combined in one package, ideal for letters and other short documents; **Mailmate**, a full-featured name and address program for small businesses, clubs or other organizations; **PET Emulator**, allows a high level of existing PET software to be used on the 64; **EasyLesson** and **EasyQuiz**, give educators the ability to create and administer lessons and tests with ease.

Commodore also has these packages available: **EasyCalc**, an electronic spreadsheet with 65 columns and 999 rows; **EasyPlot**, for full-page printing of charts and graphs; **EasySchedule**, sets up time and resource schedules; **EasyFinance**, helps evaluate financial opportunities; and **EasyScript**, a full-featured word processor.

In addition to these Commodore-contracted software developments, Commodore is also encouraging independent vendors to develop software for the 64. Right now over 200 software projects are already in progress, worldwide. And we might remind you here that the 64 also


offers a CP/M* option that provides access to over 2000 programs in addition to those developed specifically for the 64 itself.

Some of the hottest news for the 64—and, in fact for all Commodore computers—is the huge public domain educational software package now available from Commodore dealers around the world. The package, developed by Commodore last summer in conjunction with the Ontario Department of Education and the government of Ontario, contains over 600 educational programs in business, computer science, English, French, history, math, science, technology and many other subjects. A complete printed catalogue, administrative programs for grading, attendance and statistical analysis, several utilities, character and sprite editor and a number of games round out the package.

The programs in this package will run on any Commodore computer, including the 64, and come on about 50 disks put together in two large volumes. For the full story on how this project came about, and Commodore's plans for continuing to develop even more educational software in the public domain, take a look at the October/November issue of *Commodore Magazine*.

And now even more seriousness for the 64—like the *Commodore 64 Programmer's Reference Guide*, which should be newly available by the time you read this. We have it on good authority that, in spite of its size (400 pages?), it is extremely friendly—in addition to being, of course, an invaluable source of information for the serious programmer. A review of the 64 PRG appears in this December's *Commodore Magazine*. (You may suspect by now that maybe you should be reading both our publications.)

Perhaps some of you more serious programmers out there don't know about the *Commodore Software Encyclopedia*. If you've got an application-type program you think might interest somebody else or a game you'd like to market, you can get some free advertising. (Not that our magazine ad rates are high—but they're higher than free.) Just send a copy of the program to the attention of the *Commodore Software Encyclopedia*, 487 Devon Park Drive, Wayne, PA 19087. If it runs well, we'll list your product, free of charge, in the *Encyclopedia*, complete with information on how to contact you.

If you've got a powerful professional-quality product, you might also want to apply for Commodore-approved status in addition to being listed in the *Encyclopedia*. That gives you the right to use the Commodore name and logo in your advertising. If you'd like to apply for approval, send your product to the attention of our Approved Products Manager at the address above. 

*CP/M is a registered trademark of Digital Research, Inc.



HOME BABYSITTER (continued from page 61)

included to both entertain children when they're on their own and teach them some basic skills in graphic composition. By pressing various keys on the keyboard children (and adults, for that matter; this part is FUN) can manipulate a face drawn on the screen to change the eyes, nose, lips, hair, etc. They can even make it stick out its tongue. Kids can combine these feature in enough ways to make more faces than are found in the mug shots in the New York police department.

The program is very user friendly, and has a few little surprises hidden away in it. Give it to your kids and maybe you'll have time to do some adult things, like playing Gorf.

PROGRAM REVIEW:

VICMON

by Bruce Robinson

Commodore's VICMON is a machine language monitor cartridge that will work on any memory configuration VIC 20. It allows you to write programs in the VIC's 6502 machine language.

Machine language has two advantages over BASIC: more compact code, and faster execution (about 100 times faster for many routines). You don't need to write an entire program in machine code, you can just call a machine language subroutine from BASIC to do things that would normally take too long in BASIC.

The VICMON contains a one-line assembler. It allows you to use mnemonics to enter your program, but it does not allow labels, since it is a one-line assembler (the code is generated immediately after you enter it). And because the VICMON only uses 256 bytes of memory, it is useful even on an unexpanded VIC 20.

While it may not be a very powerful assembler, its strong suit is in debugging aids. You can set break points in RAM and ROM, and specify the number of times the program must pass through the point before halting.

There are three modes in which the VICMON can execute a program. It can run at full speed, quicktrace, or a single step mode. Single step mode allows you to plod through the program one instruction at a time. You see exactly what the machine is doing. Quicktrace will stop for break points or when you hit the 'RUN/STOP' and 'X' keys at the same time.

VICMON can move code and modify the code's absolute references. It will disassemble code, search through code for all occurrences of specified bytes, and fill in memory with a specified byte. It can display the memory in hexadecimal or ASCII format, and you can save or load a machine language program.

While the VICMON is not a sophisticated assembler, it is an invaluable aid for machine language programmers. It is easy to use and well worth \$59.95.

YOU ARE GOING TO SMILE!

--When you see over 2000 books, programs, and accessories we carry for All Major Brands in our Computer SOURCE BOOK[®]. From introductory level to professional, we cover it all. Listed Below is just a sample of what we carry. DEALER INQUIRIES WELCOME



NEW NEW Vic 20™ GAMES

Direct from England, JMC is proud to announce that we have been appointed the exclusive U.S. importer for the following Vic-20 games.

MINEFIELD. A game for the 5K Vic 20. For Ages 6 and over. Your task is to drive an ambulance around a battle ground and pick up injured soldiers--racing the clock, and avoiding touching off the buried mines. You can adjust the complexity of the game by choosing to play against 25 to 100 mines.
4002-000001 \$15.95

MAZE OF DEATH. For 5K Vic-20. For ages 8 and over. You have to travel across the screen thru a maze of walls blocking your path. Unseen hobgoblins and monsters may capture you before you reach your safe haven--the other hand you may find buried treasure to add to your fortune. Full details scroll on the screen when you start game. 7 skill levels and 10 sensitivity levels to choose from.
4002-000002 \$15.95

SLOTTER. For 5K Vic-20. For ages 8 and over. You control a worm type animal that moves over the screen to gobble up the ugly spots--a race against time. If you bump into a wall, or turn back on yourself to quickly--you LOSE. You choose skill level from #1 (hardest) to #20 (easiest). If you really want to drive someone crazy, buy him this game!
4002-000003 \$15.95

GUZZLER. For 5K Vic-20. For ages 8 and over. You must pilot your space shuttle thru a maze of asteroids to your mother ship. But if you are not careful you will awaken the Guzzler's space bouys. You have to reach your mother ship before running out of fuel.
4002-000004 \$15.95

DELUX 6-PAK. For 5K Vic-20. Here is your chance to buy 6 games on one cassette for the price of one game! You get all six of the following games for ONE low price! War. You are defending against waves of enemy tanks. 3 levels of play...we bet you can't win at level 3!

Smashout. This version of bricks game tests skill, not reaction time, plan ahead!
Blackjack. Popular card game '21'. If you practice long enough maybe you can plan a system to beat Las Vegas!
Logic. You have 12 tries to break the code of 5 balls in random color sequence.
Pickup game. You have to remove logs from the pile without disturbing any other logs.
Alarm Clock. Use the Computer as a REAL 24 hour alarm clock, bet you can't ignore its call when the alarm goes off!
4003-000001 \$19.95

ANT RAIDERS. For 5K Vic-20. Ages 8 and up. An army of ants is marching its way across the land leading to your home. The land is littered with rocks which make the ants change direction often. You must shoot the ants before one gets to your door. If you shoot a rock it will divide into more rocks. If you trap all the ants, then more will come until you trap all the group, then more will come until...well you get the idea...have FUN!
4003-000003 \$15.95

MORE GAMES COMING! We are working on more Vic-20 games which we will be importing in the near future. watch our ads for details!



DEPARTMENT: F-4
1025 INDUSTRIAL DRIVE
BENSENVILLE, IL 60106-1297

MITE-Y PROGRAMS FOR THE VIC-20*

WORD MITE + \$14.95

This program is a mighty little word processor which enters and edits text with screen edit features. Write and read tapes with named text files, display, print texts with selected page, line length, margin, tab, case, space. Instruction text included.

ADDRESS MITE \$14.95

Creates and maintains taped name and address lists. Entries are typed in natural format. Review, edit, sort by name or zip, and use KEY and WORD searches to display, tape, print out sublists.

LETTER MITE \$14.95

Edits, prints personalized letters using texts from WORD MITE +, names/addresses from ADDRESS MITE. Insert first, last, full name into text. Print address, edited text with selected parameters.

LIST MITE \$14.95

Handles general lists of items with your own entry format. Edit, search by KEY or WORD, read/write tape files, sort. Display and print the items. Use for inventories, collections, recipes, etc.

SPECIAL!!

Newsletter package includes WORD MITE +, ADDRESS MITE, LETTER MITE, plus DATA tape! \$36.95

All run in standard 5K memory; expansion allows longer texts. Std. versions for VIC printer; RS-232 versions need 8K.

MORE--WRITE FOR CATALOG, QUANTITY DISCOUNTS.
* VIC-20 is a TM of Commodore.

NELSON SOFTWARE

2232 Ogden Ct., St. Paul, MN 55119

(612) 738-1080

Commodore VIC 20 Price List

ORDER NUMBER	PRODUCT NAME AND DESCRIPTION	RETAIL PRICE
--------------	------------------------------	--------------

THE VIC 20 SYSTEM HARDWARE AND PERIPHERALS

VIC20	VIC 20—The Friendly Computer Commodore's revolutionary personal computer features color, sound, graphics, programmable function keys, built-in BASIC, expandable memory, low-priced peripherals and more! Connects to any TV or monitor. Includes RF modulator, switchbox, cables and self-teaching instruction book.	\$299.95
VIC1530	Commodore Datasette Provides handy economical storage of user-written or pre-recorded programs using ordinary audio tape cassettes. Works like standard tape recorder, includes tape counter.	75.00
VIC1540/1	VIC 1540/1 Single Disk Drive Fast, high capacity storage and retrieval of data on standard 5¼-inch floppy diskettes. Stores up to 170K on each diskette, with read/write compatibility with PET/CBM computer systems.	399.00
VIC1525	VIC Graphic Printer Economical dot matrix printer makes paper copies of BASIC programs, letters, business data and graphic displays. Connects directly to the VIC, prints all characters including letters, numbers and graphics. Prints 30 characters per second. Reliable tractor feed mechanism. Device 4/5 and test switch. Accepts sprocketed roll or sheet paper.	395.00
VIC1600	VICMODEM (Telephone Interface) Lets VIC owners communicate by telephone, access telecomputing and timesharing services. VICMODEM cartridge plugs into the VIC's user port, connects to any modular-jack phone handset. Includes VICTERM 1 terminal program on tape. (Software included)	109.95
VIC1311	JOYSTICK Single joystick for playing computer games, remote control computing. Connects to VIC Game Port.	8.95
VIC1312	TWO PLAYER GAME PADDLES Double paddle controllers for two player game action. Full rotation with "fire button." Connects to VIC Game Port.	14.95

MEMORY EXPANSION CARTRIDGES

VIC1210	VIC 3K Memory Expander Cartridge Plugs directly into the VIC's expansion port, expands memory to 8K RAM total.	39.95
VIC1110	VIC 8K Memory Expander Cartridge 8K RAM expansion cartridge plugs directly into the VIC.	59.95
VIC1111	VIC 16K MEMORY EXPANDER CARTRIDGE For use with VIC 20 and/or VIC1010 EXPANSION MODULE.	109.95

INTERFACE CARTRIDGES

VIC1011A	RS232C Terminal Interface Provides interface between the VIC 20 and RS232C telecommunications modems. Connects to the VIC's user port. (Not required for modem)	49.95
----------	---	-------

RECREATIONAL GAMES ON CARTRIDGE

VIDEO ARCADE SERIES

VIC1901	VIC AVENGER It's an invasion of space intruders and you're the VIC "Avenger." Space action for arcade enthusiasts.	29.95
VIC1904	SUPERSLOT Colorful slot machine game works just like the real thing! Great music and sound effects!	29.95

ORDER NUMBER	PRODUCT NAME AND DESCRIPTION	RETAIL PRICE
--------------	------------------------------	--------------

VIC1906	VIC SUPER ALIEN You're trapped in a maze and your only defense is the "alien buster." Can you capture the aliens before they zap you?	29.95
VIC1907	JUPITER LANDER Pilot your "Jupiter Lander" through the treacherous crevices of a mysterious planet. Variable rocket thrust, anti-gravity, horizontal retros.	29.95
VIC1908	DRAW POKER Casino-style poker recreates the real thing! Superb animation and sound effects add to the fun, mystery and luck.	29.95
VIC1909	MIDNIGHT DRIVE/ROAD RACE Authentic night driving simulation provides thrills, chills and ... spills? An unusual computer challenge.	29.95
VIC1910	RADAR RAT RACE The magical mystical mouse maze makes for a fast-paced, challenging game of wit, strategy and reflexes. Excellent graphics.	29.95
VIC1913	RAID ON FORT KNOX You're scurrying through a complex of tunnels below Fort Knox. Just ahead you spot the gold ... now grab it and try to escape before the guards find you!	29.95
VIC1919	SARGON II CHESS SEVEN challenging play levels. Called the "best" microcomputer chess program by experts, SARGON II makes the VIC a challenging chess opponent.	39.95
VIC1921	SUPER SMASH The World Championship is at stake! As a finalist do you have the cat-like reflexes to return the speeding ball and take the crown? On your toes ... this is racketball at its toughest!	29.95
VIC1922	COSMIC CRUNCHER Maneuver your "Cosmic Cruncher" through the Milky Way and "crunch" all the pulsars in the galaxy ... eleven challenging levels of play ... over 300 color/maze combinations. Exciting arcade action!	29.95
VIC1923	GORF* (The smash-hit arcade game!) Midway's incredible coin-operated game is now on cartridge for the VIC! Includes 4 completely different games, multiple levels of difficulty, some of the best cartoon graphics ever devised for video games. Invaders, gorfies, death ships, saucers, aliens ... it's terrific!	39.95
VIC1924	OMEGA RACE* (The smash-hit arcade game!) The ultimate space game. One of the most popular coin-op games of the year! You've got one Omegan fighter maneuvering against droid ships, command ships, death ships, photo mines and vapor mines. Fantastic "rubber band" boundaries, multiple levels of difficulty ... all the features that made the Bally/Midway game so successful! 1 or 2 players.	39.95
VIC1925	MONEY WARS Lights flash, shots ring out! Can you escape or are you trapped? Look out, someone is shooting at you from the sky ... grab the MONEY and RUN!! Increasingly difficult levels of play ... exciting action!!	29.95
VIC1926	MENAGERIE Maneuver your flea through the deadly spider swamp ... on to the mystical wall for a brief rest ... quickly hitch a ride on one of the travelling menagerie of animals for the final trek through the desert.	29.95
VIC1927	COSMIC JAILBREAK Three deadly criminals are trapped behind bars ... can you keep them in? There's a conspiracy against you ... you are under constant attack ... but you must protect yourself from a cosmic jailbreak occurring. FIFTEEN levels of play, increasingly fast action.	29.95
VIC1931	CLOWNS* Come one, come all ... see the amazing jumping clowns ... direct from their show-stopping Bally/Midway arcade tour ... A true arcade "classic"! Colorful acrobatics with high scoring skill.	29.95
VIC1932	GARDEN WARS Maneuver your mouse through the deadly garden ... filled with enemies ... caterpillars, snakes, snails and spiders. This is no "Garden of Earthly Delights" ... squirm, dodge, and run for your life through the deadly maze-like garden ... fast arcade action!	29.95

(Commodore List continued)

ORDER NUMBER	PRODUCT NAME AND DESCRIPTION	RETAIL PRICE
VIC1937	SEA WOLF* As submarine commander you are in charge of sinking and destroying all enemy ships... destroyers, freighters and PT boats... an explosive Bally/Midway "arcade classic". Fast action fun!!	29.95
SCOTT ADAMS ADVENTURE GAMES		
VIC1914	ADVENTURE LAND ADVENTURE The premiere Scott Adams "Adventure" game ideal for beginning "Adventure" players. Formerly available only on larger, more expensive computers. All Adventure games are decoded to "talk" on the "TYPE N TALK" voice synthesizer (available from VOTRAX).	39.95
VIC1915	PIRATE COVE ADVENTURE Yo, ho, ho and a bottle of rum... much more in this treasure island of excitement. Decoded for TYPE N TALK* by Scott Adams.	39.95
VIC1916	MISSION IMPOSSIBLE ADVENTURE Your mission is to disarm a volatile nuclear reactor. Tense, challenging fun. Decoded for TYPE N TALK* by Scott Adams.	39.95
VIC1917	THE COUNT ADVENTURE You're trapped in Count Dracula's castle and you have 3 days to find and destroy the vampire. Decoded for TYPE N TALK* by Scott Adams.	39.95
VIC1918	VOODOO CASTLE ADVENTURE Count Yorga has been cursed and you have to free him from the curse. Voodoo statues, crystal balls and magic rings. TYPE N TALK* by Scott Adams.	39.95
CHILDREN'S SERIES		
VIC1911	THE SKY IS FALLING Help Chicken Little by catching pieces of the sky as they fall! A great "first game" to teach motor skills... fun and challenging.	29.95
VIC1912	MOLE ATTACK A colorful "cartoon action" game. You're trying to keep those nasty moles underground where they belong but they keep popping up! How many can you clunk before time runs out? Fast, fun, frantic!	29.95
VIC1933	BINGO SPEED MATH Two learning games in one. Learn to add, subtract, multiply and divide... while having fun. Teach your child to think and respond quickly while having fun. Math is made simple and fun with BINGO/SPEED math.	29.95
VIC1928	HOME BABYSITTER Three preschool game programs help teach your preschool children counting, the alphabet and relationship skills. Keep your children occupied for hours while giving him or her a headstart in school. The parent's manual helps your child get the most out of this excellent development aid.	29.95
VIC1930	VISIBLE SOLAR SYSTEM Astronomy buffs love this incredible game-science-learning tool. Journey to the major planets of our solar system, learn key statistics about each planet... OR... record atmospheric conditions and compare planetary statistics using "Astro Calc." A wonderful astronomy tool which gives you a tour of the solar system and teaches you about major planets along the way.	29.95
HOME IMPROVEMENT CARTRIDGES		
VIC1929	PERSONAL FINANCE Your budget, expenses and personal finances are simply computerized through this business package. Personal Finance will organize, arrange and computerize your home financial expenses.	39.95
PROGRAMMING AID CARTRIDGES		
VIC1211A	VIC 20 Super Expander Everything Commodore could pack into one cartridge—3K RAM memory expansion, high resolution graphics plotting, color, paint and sound commands. Graphic, text, multicolor and music modes. 1024 x 1024 dot screen plotting. All commands may be typed as new BASIC commands or accessed by hitting one of the VIC's special function keys. Includes tutorial instruction book. Excellent for all programming levels.	69.95
VIC1212	Programmers Aid Cartridge More than 20 new BASIC commands help new and experienced programmers renumber, trace and edit BASIC programs. Trace any program line-by-line as it executes, pause to edit. Special KEY command lets programmers redefine function keys as BASIC commands, subroutines or new commands.	59.95
VIC1213	VICMON Machine Language Monitor Helps machine code programmers write fast, efficient 6502 assembly language programs. Includes one line assembler/disassembler.	59.95

ORDER NUMBER	PRODUCT NAME AND DESCRIPTION	RETAIL PRICE
TEACH YOURSELF PROGRAMMING SERIES		
VL102	Introduction to BASIC Programming—Part I A gentle but thorough introduction to BASIC programming. Excellent first book for any new computerist. Tutorial lesson tapes included.	24.95
VL103	BASIC Programming—Part II A continuation of the excellent BASIC programming series with more programs, lessons, and instructional aids.	24.95
APPLICATION PROGRAMS ON TAPE		
The following prerecorded programs are designed for use with the Commodore Datasette Tape Recorder. Programs on tape come in several varieties and are color coded by category as follows: Recreation (red), Education (blue), Business/Calculation (green), Home Utility (orange) and Computing Aid (black).		
VT106A	Recreation Program Pack* Car Chase—Fast-paced road action VIC 21—Casino-style blackjack Blue Meanies From Outer Space—Space game Biorhythm Compatibility—Compare biorhythms Spacemath—Math improvement grades 1-6 Slither/Super Slither—dexterity game	59.95
VT107A	Home Calculation Program Pack* Personal Finance I—Home budget Personal Finance II—Home budget VIC Typewriter—Word processor for home use Expense Calendar—Income, expenses, appointments Loan & Mortgage Calculator—Decision-making aid Home Inventory—Home belongings list	59.95
VT164	Programmable Character Set/Gamegraphics Editor Lets the VIC user create up to 64 programmable characters and use them in BASIC programs. The Editor takes only one-half kilobyte of program space, works with tape, disk and printer.	14.95
VT232	VICterm I—Terminal Emulator A handy VIC terminal program on tape which converts any VIC to a terminal for use with a telephone modem. (See RS232 Interface)	9.95
VIC 20 BOOKS AND MANUALS		
VM100	PERSONAL COMPUTING ON THE VIC 20 The "friendliest" computer instruction guide available. The owner's manual comes free with every VIC 20 but is also in demand by teachers who use it in the classroom, and by "VIC families" who want more than one guide for each family member.	5.95
VM110	VIC 20 PROGRAMMERS REFERENCE GUIDE The master VIC 20 reference manual includes information on VIC BASIC, 6502 Machine Code Programming, Input/Output ports, VIC microprocessing chips, and tips for all levels of programmers. Indispensable.	16.95
ACCESSORIES AND REPLACEMENT PARTS		
VIC1515P	VIC GRAPHIC PRINTER PAPER 1000 sheet pack, tractor feed, 15 lb. bond	15.00
VIC1515R	VIC PRINTER RIBBON CARTRIDGE for VIC Graphic Printer	9.95
VIC90477801	TV SWITCHBOX	7.95
VIC90510101	RF CABLE	2.95
VIC902505	POWER SUPPLY	19.95
VIC32145301	MODULATOR	19.95
*Bally Midway games developed under Commodore's licensing agreement with Bally Manufacturing Co.		
Prices are subject to change without notice.		
Commodore Business Machines, Inc. Consumer Products Division 427 Devon Park Drive, Wayne, PA 19087 (215) 687-9765		

25

of The Hundreds of Reasons You Ought To Be A **COMPUTE!** Magazine Subscriber:

From "The Editor's Feedback" Card, a monthly part of our continuing dialogue with readers of **COMPUTE!**. These are responses to the question,

"What do you like best about **COMPUTE!**?"

1. "It is written so a beginner can read and understand it... it's layman oriented..."
2. "Clear, clean layout, good presentation..."
3. "The Atari game programs..."
4. "Best and most information on PET..."
5. "Cover to cover, and all in between..."
6. "Reviews of software and hardware..."
7. "Good balance of application and technical articles..."
8. "It is the best source of info about various levels of VIC/PET/CBM machines and applications..."
9. "The BASIC and machine language programs..."
10. "I like programs that can be typed into a computer, run, and then used right away (a program without bugs!)"
11. "That it is organized well, and covers a broad range of information concerning Atari. Keep it up! please, I'm learning..."
12. "Table of contents listings and computer guide to articles is a great idea. Best magazine for personal home computer users..."
13. "Best I have found for VIC info..."
14. "Informative articles: 'Secrets of Atari', Game programs, especially programs that teach the reader about the Atari..."
15. "I like all the articles and programs for my computer, the PET. I've learned and found out things about it that I never even thought existed. Other magazines don't have too much material for the PET and, for that reason, I find **COMPUTE!** invaluable..."
16. "The up-to-date hardware reviews..."
17. "Machine language utilities for Atari..."
18. "Articles are terse but understandable and accurate. Utility and applications program listings very helpful..."
19. "The April, '82 issue is my first. I am impressed that you not only acknowledge the VIC-20, you even have applications for it..."
20. "I really enjoy (since I am one) the Beginner's Page..."
21. "The attention it gives to Atari and the easy-to-understand language it's written in..."
22. "It is concerned with explaining programs, not just listing them. It is the best VIC magazine I could buy..."
23. "The new table of contents 'Guide to Articles and Programs' is excellent, particularly the indication of 'multiple computer' items..."
24. "Broad range (sophistication) of programs..."
25. "You don't speak over the average user's head..."

Whether you're just getting started with personal computers, or very advanced, you'll find useful, helpful information in every issue of **COMPUTE!** Magazine. We specialize in supporting the Atari, PET/CBM, VIC-20, and Apple computers. Editorial coverage is expanding to include the TI-99/4A, the Sinclair ZX-81, and the Radio Shack Color Computer.

Every issue of **COMPUTE!** brings you user-friendly articles, applications programs, and utilities you can type right into your computer and use. To subscribe to **COMPUTE!**, or to order a sample issue, use the attached reply card or call our toll-free number. **COMPUTE!**... We're the resource for thousands and thousands of home, educational, and small business computer users. Shouldn't you be one of them?

1 year, twelve issue subscription: \$20.00 in the US.

Call Toll Free in the US 800-334-0868
In NC call 919-275-9809

COMPUTE! Magazine is a publication of Small System Services, Inc.
625 Fulton Street. P.O. Box 5406. Greensboro, NC 27403.

commodore COMPUTER



Commodore Business Machines, Inc.
The Meadows, 487 Devon Park Drive
Wayne, Pennsylvania 19087

Address Correction Requested

Bulk Rate
U.S. Postage Paid
Permit No. 845
Philadelphia,
PA 19107