RUN Establishes Education SIG!

The Commodore C-128/C-64 Home Computing Guide

U.S.A. $2.95
CANADA $3.95

RUN

Font California

June 1986 A CWC/I Publication

DISCOVER GEOS: CREATE A FRIENDLIER AND MORE POWERFUL C-64

DESK TOP

calculator

THREE SUPER UTILITIES:

C-128 CHARACTER GENERATOR

QUICK MERGE 64

C-64 EASY DISK-FILE CONVERSION

PLUS:

IN SEARCH OF THE PERFECT PRINTER, PART II



Also Inside: Special Section On Education

0 74470 12069 06

If you own a C-64, you

The one you purchased. And the

GEOS realizes the technical potential that has been in the C-64 all along. Speed. Power. Ease of use. Sophistication. Elegant, practical applications you might expect of a high-end personal computer, all made possible with GEOS. It's so simple—but then, so was fire. Once it caught on.

To begin at the beginning. **GEOS** stands for **GRAPHIC ENVIRONMENT OPERATING SYSTEM.** Why?

GRAPHIC: Because menus and icons replace long, typed command lines. Point and click, that's it.

ENVIRONMENT: Because GEOS provides a consistent, powerful way to use your computer. Learning new applications is a snap (or should we say click).

OPERATING SYSTEM: Because GEOS orchestrates every function so that they all work together systematically, even symphonically.

Some basics. Icons are graphic images which represent files or utilities. Each is different, and all are easy to recognize and easy to use.

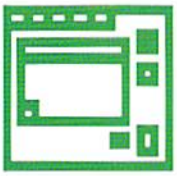
A menu is just that: a list of functions available for selection. When a menu appears, move the pointer to any item you wish. Click. Click. You're on your way.

A pointer is used to select and activate items. To move the pointer, roll the mouse or trackball or rotate the joystick. Once on target, click once to select; click a second time to activate.

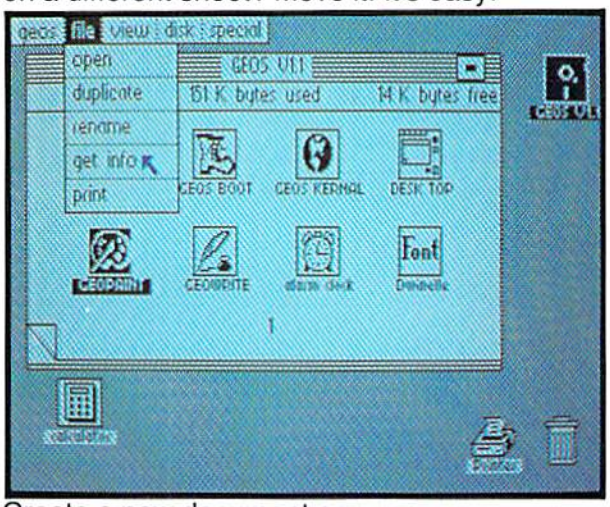
Fonts are a new way of looking at text. Choose from 5 different fonts (with more on the way). Try Dwinelle, or Roma, **bold,** or *italics,* even underline and outline. Need to fit more words on a line? Pick a smaller point size, like University 6 point, and get over one hundred characters per line.

All this and fast too. Because the integrated diskTurbo software improves 1541 disk drive performance 5 to 7 times. That's right. On both reads and writes.

GEOS can be divided into 4 areas: two functional aspects (deskTop and Desk Accessories), and two major applications (geoPaint and geoWrite).



deskTop. deskTop is a graphic interface, making file organization and management easy. As always, you call the shots. Load a disk. Files appear as icons on the disk notepad; to flip through, point at the folded corner and click. Prefer a file appear on a different sheet? Move it. It's easy.



Create a new document or re-name an existing one. Want to copy a file onto the same or a different disk? Fine. Forgotten what a file contains? Select "get info" from the file menu. A description of that file's contents appears. Finished with a file? Print it. Save it. Or drop it in the trash and have done with it. Your call.

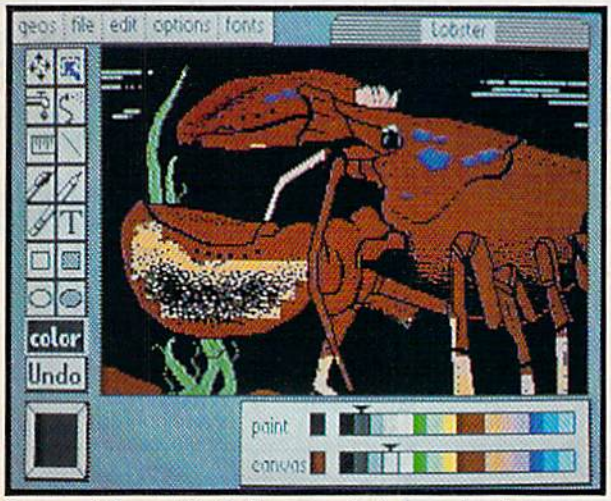


geoPaint. A full-featured, color graphics workshop at your fingertips. The pointer operates any one of the fourteen graphic tools and shapes in the drawing menu. Create masterpieces on the Drawing Window. By turns, use a pencil, an airbrush or a paint brush, each with a character all its own. Draw straight lines, squares, rectangles or circles. Fill in with any of the 32 patterns. Switch to pixel-mode, where each dot in a selected section is magnified many times its size for easy manipulation.

Circle 134 on Reader Service card.

own two Machines.

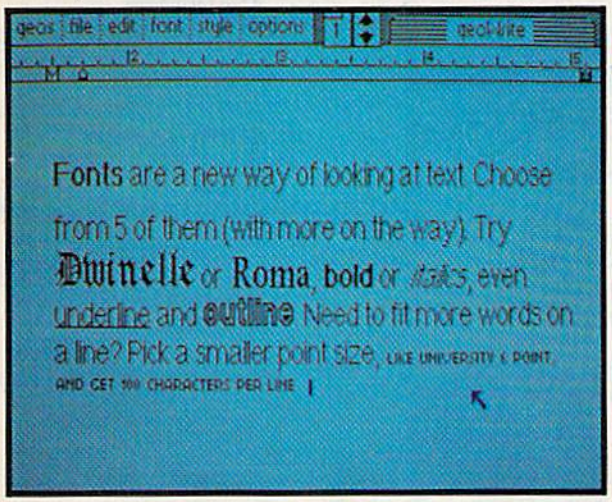
personal computer GEOS™ unlocks.



Second thoughts? Erase what you don't want. Or "UNDO" your last act. (If only life could imitate art!)

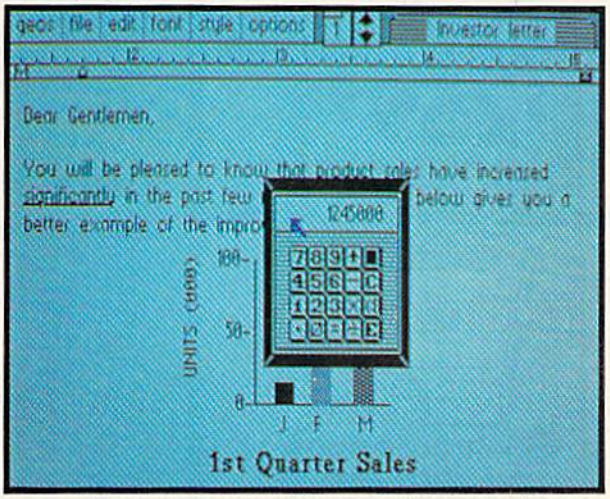
Add text if you like, in different fonts, styles or point sizes. Even change its position or layout at will.

Move or copy any part of your creation. Once done, you can include your artwork in another document—a letter home perhaps. (Won't Mother be pleased?) GEOS makes it easy.



geoWrite. An easy to use, "what you see is what you get" word processor. Create documents. Insert, copy, move or delete text as you wish. Choose from 5 different fonts in many different styles and point sizes. Preview your page exactly as it will appear off the printer. Typists will appreciate tabs, word-wrap and page breaks.

Documents may contain up to 64 pages. What's more, you can move to any page instantly. If you like, you can cut selected text from one section and move or copy it to another. Add graphics from geoPaint. It's a cinch.



Desk Accessories. Handy programs you can use while in any GEOS application. These include an alarm clock, a notepad for reminders, a four-function calculator, and photo and text albums which store pictures and phrases you may then paste into applications. The Preference Manager even lets you establish parameters for everything from mouse speed to the date and time—even background color. Civilized options, every one.

BERKELEY Softworks

GEOS, A Whole New World for the C-64.

$59.95 TO ORDER: 800-443-0100 x234

GEOS Diskette includes deskTop, diskTurbo, geoPaint, geoWrite and desk Accessories $59.95.
CA residents add 6.5% tax. ($4.50 US/7.50 Foreign shipping and handling.)
US Funds only. B.S.W Order Processing, PO Box 57135, Hayward, CA 94545

Commodore 64 and C-64 are trademarks of Commodore Electronics, Ltd. GEOS, deskTop, geoPaint, geoWrite, diskTurbo and Berkeley Softworks are trademarks of Berkeley Softworks.

COMPUTER CENTERS OF AMERICA

Sizzling Summer All Your Computer

commodore



commodore
128
PERSONAL COMPUTER
$259.95
•Including: Shipping, Handling and Insurance—No Extra Charges



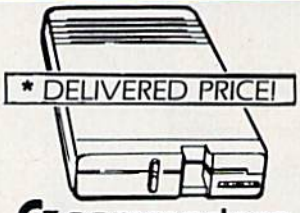
commodore
64 PACKAGE
INCLUDES:
•Commodore 64 Computer
•Commodore 1541 Disc Drive
• A Color Monitor with Cables
CALL FOR PRICE

PRINTER SPECIALS FROM CCA

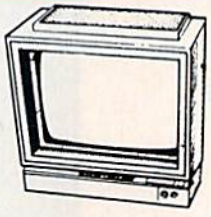
STAR POWER TYPE
•Letter Quality
•18 CPS
•13" Carriage with Comm. Interface.
$259.95
BEST BUY SPECIAL

GEMINI STAR 10X
$149

commodore
1670 MODEM
• 1200 Baud
$159.95



commodore
1571 DISC DRIVE
$249.95
•Including: Shipping, Handling and Insurance—No Extra Charges



commodore
1902 MONITOR
CALL FOR PRICE



Goldstar
13" COLOR COMPOSITE MONITOR
•Cables included •1 Yr. Mfr. Warranty
$124.95



INTERFACES

Teleys Turbopoint GT Prints Enhanced Graphics	$59.95
Cardco G +	Call for Price
Microworld	Call for Price
PPI	$44.95
Xelec - Super Graphics Sr.	$69.95
Xelec - Super Graphics Jr.	$49.95

SUMMER SPECIAL PACKAGE

- Commodore 128
- Commodore 1571
- RGB/Composite
- Color Monitor

$729.95
* DELIVERED PRICE



COMPUTER
COMPUTER CENTERS OF AMERICA
81 TERMINAL DRIVE
PLAINVIEW, NY 11803



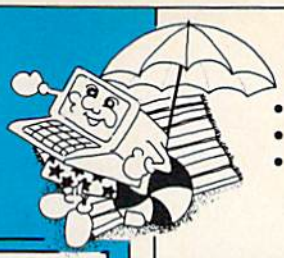
CMS FOR 128 Commodore PERSONAL COMPUTER SPREAD SHEET BOOK PACKAGE
$139.95

IN NEW YORK STATE CALL TOLL FREE
1-800-221-2760 or 516-349-1020
OR WRITE: COMPUTER CENTERS OF AMERICA, 81 TERMINAL DRIVE, PLAINVIEW, NY 11803

1-800-631-1003
1-800-548-0009

*IN CONTINENTAL USA ONLY APO PLUS FPO EXTRA

Specials On Needs



SP-1000

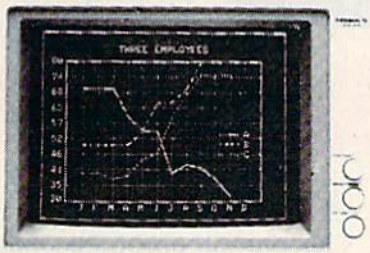
- Built-in Commodore Interface
- 2-Year Warranty
- Near Letter Quality Mode



$189.95
SEIKOSHA

LIMITED TIME ONLY
SPECIAL INTRODUCTORY PRICE

14" COLOR RGB MONITOR
THOMSON
A sight for sore eyes.



RGB AND COLOR COMPOSITE
$249.95
SPECIAL INTRODUCTORY PRICE

COSMI

WHERE THE ACTION IS!
For Commodore 64/128

TALLADEGA
FORBIDDEN FOREST
$12.95
*DELIVERED PRICE

SUPER HUEY



MEMOREX SPECIAL
WORK STATION



Regular Price 29.95
Factory Rebate 5.00
YOUR COST $24.95
•20 Disks •Disk Case

Paperback Writer 128



Professional Word Processor for the Commodore 128
$24.95

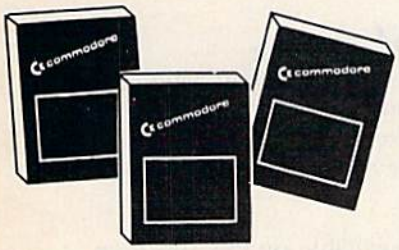
DISKETTES



Nashua	$8.95
Scotch	$11.95
Maxell	$11.95
Memorex	$8.95*
BASF	$8.95

*After $3 Rebate

commodore



Assembler D	$27.95
Easy Finance I, II, III, IV-D	$19.95
Easy Calc-D	$64.95
Easy Script-D	$39.95
Easy Spell-D	$19.95
Logo-D	$49.95
The Manager-D	$37.95
General Ledger	$37.95
Accts. Rec.-D	$37.95
Accts. Pay.-D	$37.95
Magic Desk-D	$52.95
Silent Butler	$24.95
Sky Travel	$27.00

epyx

BUSINESS SOFTWARE FOR 128 COMMODORE COMPUTER

39.95 MICROSOFT MULTI PLANNER

29.95 PROGRAMMER'S BASIC TOOL KIT

CALL FOR PRICES

epyx YOUR CHOICE



$24.95 *DELIVERED PRICE

Kronis Rift - Lucas Games	Temple of Asphai Trilogy
Eidolon - Lucas Games	Jet Combat Simulator
Ballblazer - Lucas Games	GI Joe
Rescue Fractalus - Lucas Games	Summer Games I or II
Fastload	Barbie
Wintergames	Baseball
Hot Wheels	

PROFESSIONAL

Fleet System 2
The Largest Spell Checker Available For Your Computer
90,000 Words on C-64/128
70,000 Words on Atari
$59.95

Fleet System 3 NEW
FOR COMMODORE 128
$64.95

penguin software™



Quest	$19.99
Transylvania	$19.99
Sword of Kadash	$19.99
Zyphus	$19.99
Graphics Magician Picture Painter	$21.99

WE'RE PROUD OF OUR PRICES— SATISFACTION GUARANTEED

Check, Money Order, MC or VISA accepted. No additional charge for MasterCard and Visa. Call for shipping and handling information / NYS residents add applicable sales tax / Prices and availability are subject to change without notice / All factory fresh merchandise with manufacturer's warranty. Dealers Welcome. Call for recent price reductions and new rebate information. Plus shipping and handling. No returns without return authorization number.



1-800-548-0009

COMPUTER
COMPUTER CENTERS OF AMERICA
81 TERMINAL DRIVE
PLAINVIEW, NY 11803

June 1986 RUN *Vol. 3, No. 6*

FEATURES

30 GEOS: "A Whole New World for Your Commodore"
GEOS is an amazing breakthrough for your C-64. Now you can implement features that rival those of much higher-priced micros.
By Matthew Stern

38 In Search of the Perfect Printer, Part II
Conclusion of our in-depth look at popular printers.
By Tim Walsh

52 Give Your C-128 More Character★
Now you can redesign any or all of 512 characters and use them in your C-128 and C-64 programs.
By Frederick Goddard

58 Grolier—Leading the Way In Education
An interview with Kathleen Hurley, vice-president of Grolier Electronic Publishing.
By Margaret Morabito

62 Education in Canada—A Favorable Climate For Commodores
Discover what our northern neighbors have been doing with Commodore computers in their schools.
By Gail Hook

66 Arithme-Sketch★
Children can practice addition and subtraction and earn one minute of drawing time for each correct answer.
By James Pellechi

74 The C-64 Goes to Second Grade
Find out how one second grade teacher is motivating her students to learn through creative uses of the computer.
By Kay Gore

78 Easy Disk-File Conversion★
These C-64 utilities make translating between sequential and program files a breeze.
By Ken Stange

84 Quick Merge!★
Save yourself the trouble of retyping your handy subroutines by letting your computer and disk drive do all the work.
By Richard De A'Morelli

★This program is available on the May/June ReRUN disk.

Cover photograph by Edward Judice

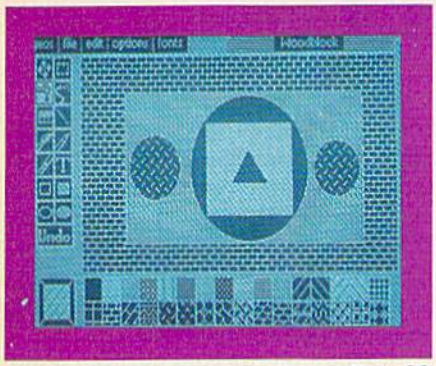
RUN (ISSN 0741-4285) is an independent journal not connected with Commodore Business Machines, Inc. *RUN* is published monthly by CW Communications/Peterborough, Inc., 80 Pine St., Peterborough, NH 03458. U.S. subscription rates $19.97, one year; $29.97, two years; $41.97, three years. Canada and Mexico $22.97, one year, U.S. funds drawn on U.S. bank. Foreign $39.97, one year, U.S. funds drawn on U.S. bank. Foreign air mail subscriptions—please inquire. Second class postage paid at Peterborough, NH, and at additional mailing offices. (Canadian second class mail registration number 9565.) Phone: 603-924-9471. Entire contents copyright 1986 by CW Communications/Peterborough, Inc. No part of this publication may be printed or otherwise reproduced without written permission from the publisher. Programs published in this magazine are for the personal use of the reader; they may not be copied or distributed. **Postmaster**: send address changes to *RUN*, Subscription Services, PO Box 954, Farmingdale, NY 11737. (Send Canadian changes of address to *RUN*, PO Box 1051, Fort Erie, Ontario, Canada L2A 5N8.) Nationally distributed by International Circulation Distributors. *RUN* makes every effort to assure the accuracy of articles, listings and circuits published in the magazine. *RUN* assumes no responsibility for damages due to errors or omissions.

MPA



Page 52

DEPARTMENTS



Page 30

6 **Publisher's Message**
Announcing Commodore's new products and strategies.

8 **RUNning Ruminations**
June's highlights.

12 **Magic**
The original column of hints and tips that let you perform computing wizardry.

18 **Software Gallery**
Chem Lab
Transylvania
At Bat Stats 64
Pipeline
Programmer's Basic Toolkit
Ultima IV: Quest of the Avatar

88 **Basically Speaking**
Exploration of Basic programming fundamentals.

92 **Telecomputing Workshop**
Advice and answers to your questions on modems, terminal programs, on-line networks, bulletin boards and more.



Page 74

94 **The Resource Center**
This month's education column highlights Commodore's support of the education market and *RUN*'s new education SIG.

102 **Commodore Clinic**
Got a problem or question related to Commodore computing? This monthly column provides the answers.

106 **Mail RUN**

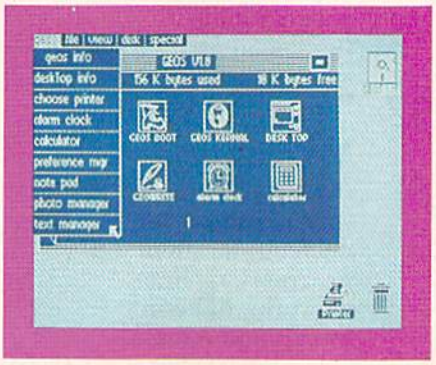
108 **New Products RUNdown**

110 **How To Type In Listings**

112 **Coming Attractions**



A Message from The Publisher



This month's cover story highlights GEOS (Graphic Environment Operating System), a new bit-mapped operating system from Berkeley Softworks for the C-64 and C-128 line of computers. June marks the first of three consecutive issues that will feature major new product releases and product strategies from Commodore.

In our July issue, *RUN* will feature in detail other new product developments from Commodore, as indicated below. The August issue will close out the series with another exciting development in the telecommunications area.

We feel that GEOS, as well as Commodore's other products and plans, will have a major long-term impact on the current Commodore user community.

Commodore's senior management has informed *RUN* that 1986 will be the year in which Commodore brings together a number of development threads designed to make the C-64 and C-128 expandable single-solution systems, capable of meeting the widest range of needs among home computer users for a very low price.

At the June Consumer Electronics Show, Commodore will introduce a number of hardware enhancements that will tremendously increase the power of the C-64 and C-128. These new products will include mass storage and memory expansion devices, plus new developments in the modem product line. The C-64 will then combine the ease of use of GEOS and the expanded power and memory available through hardware add-ons, as well as several new telecommunications developments from Commodore.

These new announcements will reveal a computer system that has taken a quantum leap in capabilities, as Commodore brings together all of the pieces in its evolving product strategy. These entry-level, low-priced computers will now provide the capabilities of high-end systems, such as the Apple Macintosh, Commodore Amiga, Atari ST and microcomputer systems using GEM.

GEOS will bring you "a whole new world for your Commodore" and greatly enhance the future and installed base of the Commodore product line. As in other high-end bit-mapped systems that shift attention from number of columns to characters per line, GEOS now gives C-64 users an opportunity to set the number of characters per line in a word processing document from 30 to 110 by simply selecting the appropriate font size.

In effect, this negates the long-standing complaint about the C-64's lack of an 80-column capacity. Under GEOS, your documents will support a wide range of printers, from the MPS-1000 dot-matrix through the Apple Image Writer and even the Hewlett-Packard laser printer.

With GEOS and Commodore's planned product introductions, your C-64 or C-128 becomes an entry-level computer with bit-mapped graphics, proportional spacing, variable fonts, laser printer resolution, memory expansion and disk-access speed on a level with the higher-end micros.

With Commodore actively supporting the development of GEOS-based software, we believe that in the near future you'll have a wide variety of GEOS applications from which to choose. In addition to the two applications, geoWrite and geoPaint, which come with GEOS, Berkeley Softworks will be delivering additional applications software. In the fall, you may expect to see geoCalc, geoTerm, geoBase and a desktop publishing program, as well as geoBasic—a new Basic that will fully exploit the GEOS operating system.

We encourage the third-party community to actively support this new operating environment for the C-64 and C-128.

Commodore has, in the past, been known for its high-quality ROM-based operating systems. Now C-64 and C-128 owners can enjoy the benefits of an even more powerful, disk-based operating system, with extensive capabilities to support the full range of professional computer applications that users have come to expect of computers costing many times as much—while still maintaining complete compatibility with all existing C-64 software.

ST

PUBLISHER
Stephen Twombly

EDITOR-IN-CHIEF
Dennis Brisson
MANAGING EDITOR/PRODUCTION
Swain Pratt
COPY EDITOR
Marilyn Annucci
REVIEW EDITOR
Susan Tanona
NEW PRODUCTS EDITOR
Harold Bjornsen
TECHNICAL MANAGER
Margaret Morabito
TECHNICAL EDITOR
Timothy Walsh
ASSOCIATE EDITOR
Jim Strasma

NATIONAL ADVERTISING SALES MANAGER
Stephen Robbins
SALES REPRESENTATIVES
Ken Blakeman, Nancy Potter
AD COORDINATOR
Heather Paquette
1-800-441-4403
MARKETING COORDINATOR
Wendie Haines
WEST COAST SALES
Giorgio Saluti, manager
1-415-328-3470
1-800-344-4636
(In California)
1060 Marsh Road
Menlo Park, CA 94025
CUSTOMER SERVICE MANAGER
Barbara Harris
SECRETARY
Sue Donohoe

ART DIRECTOR
Glenn Suokko
PRODUCTION/ADVERTISING SUPERVISOR
Rosalyn Scribner
EDITORIAL DESIGN
Anne Dillon
Karla M. Whitney

PRESIDENT/CEO
James S. Povec
VICE-PRESIDENT/FINANCE
Roger Murphy
VICE-PRESIDENT OF PLANNING AND CIRCULATION
William P. Howard
BUSINESS MANAGER
Matt Smith
EXECUTIVE CREATIVE DIRECTOR
Christine Destrempes

CIRCULATION MANAGER
Frank S. Smith
DIRECT MARKETING MANAGER
Bonnie Welsh
SINGLE COPY SALES MANAGER
Linda Ruth
TELEMARKETING MANAGER
Raino Wirein
AUDITS AND STATISTICS MANAGER
Susan Hanshaw

SPECIAL PRODUCTS DIRECTOR
Jeff DeTray
SPECIAL PRODUCTS MANAGER
Craig Pierce

GRAPHIC SERVICES MANAGER
Dennis Christensen
TYPESETTING SUPERVISOR
Linda P. Canale
TYPESETTER
Doreen Means

MANUFACTURING MANAGER
Susan Gross

DIRECTOR OF CREDIT SALES & COLLECTIONS
William M. Boyer

FOUNDER
Wayne Green

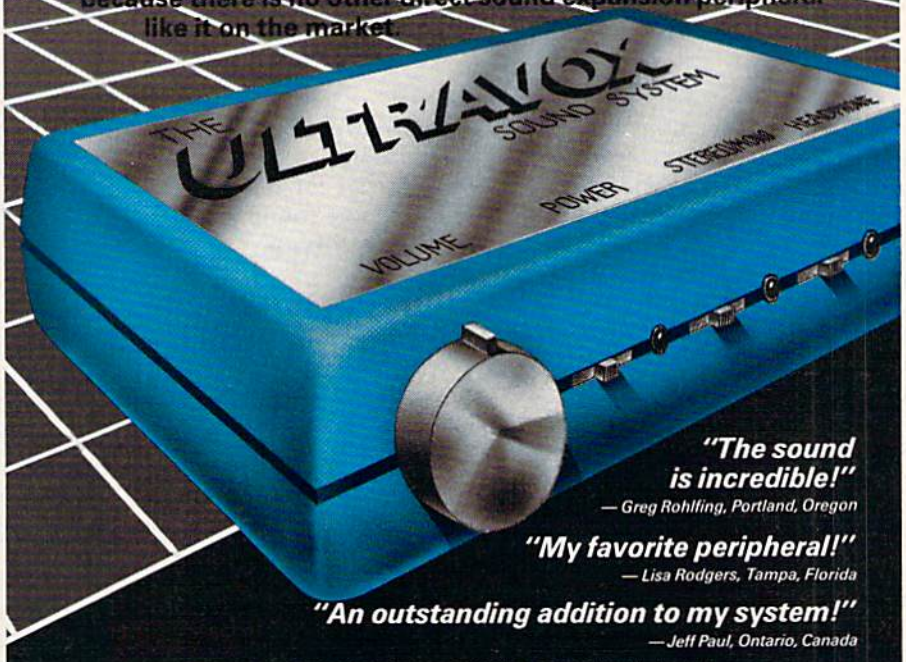
Circle 141 on Reader Service card.

You wouldn't settle for half the screen. Don't settle for half the sound!

INTRODUCING

THE **ULTRAVOX** *SOUND SYSTEM™*

The ULTRAVOX Sound System cannot be compared to any other peripheral, such as a modem, printer or disk drive, because there is no other direct sound expansion peripheral like it on the market.



"The sound is incredible!"
— Greg Rohlfing, Portland, Oregon

"My favorite peripheral!"
— Lisa Rodgers, Tampa, Florida

"An outstanding addition to my system!"
— Jeff Paul, Ontario, Canada

THE ULTIMATE SOUND PERIPHERAL

Highly-sophisticated, with crossover frequencies designed specifically for the **COMMODORE and MACINTOSH**

There's no other peripheral like it! The ULTRAVOX Sound System™ adds an exciting new dimension to all your game and music programs by generating incomparable stereo sound from your Commodore 64, 128 (64 or 128 mode), 16, or +4, or from your Macintosh computer. A built-in amp powers your speakers directly, or plug the low level outputs right into your home stereo. And with the headphone jack you can even enjoy your full-stereo sound in private.

- **Full stereo separation.**
- **100% compatible with all software.**
- **Easy to use, no software required.**
- **Sets up in seconds, no soldering.**
- **Low level outputs compatible with your stereo.**
- **Direct speaker outputs.**
- **Headphone jack included.**
- **Full volume control.**
- **100% external hardware.**
- **Power supply and complete operations manual included.**

COMPLETE READY-TO-GO SYSTEM ONLY $69.95 plus $4.00 shipping/insurance (For COD orders add an additional $4.00.)

VISA, Mastercard, C.O.D.

CALL NOW (503) 254-7855

OR SEND CHECK OR MONEY ORDER TO

PRECISION PERIPHERALS AND SOFTWARE
P.O. Box 20395 Portland, Oregon 97220

All orders shipped within 24 hours. Dealer inquiries welcome.



June Highlights

With the introduction of GEOS (this month's cover story), a new chapter is being written in the history of Commodore computing. GEOS opens up a "whole new world for the C-64" with sophisticated applications that rival those found on much higher-priced micros. It promises to greatly increase the capabilities available to C-64 owners.

For the majority of users, GEOS is an introduction to icons, pull-down menus, dialogue boxes, windows and easy file handling using the mouse technology. It's easy and fun to use.

But GEOS is only the beginning. In the coming months we'll be highlighting other Commodore breakthroughs (including a C-128 GEOS) for C-64 and C-128 users. Stay tuned.

This June issue also presents a special focus on education, an area where, quite frankly, Commodore has a lot of catching up to do. It trails both Apple and Radio Shack as the preferred computer in the schools.

However, Commodore *is* attempting to beef up its support of the education market, as Pat Walkington, manager of Commodore educational marketing, explains in this month's Resource Center. Some of the ways in which Commodore plans to support the educational market include:

—a network of over 100 authorized education dealers who give advice and recommendations to schools about the purchase of Commodore hardware and software.
—School Service Program, which trains school personnel in the maintenance of Commodore equipment.
—support of third parties in the development of quality educational software for the C-64 and C-128.
—bundling of educational software samplers with new computers.
—support of national educational projects such as the Young Astronaut Program.

Commodore does have its loyal supporters in the educational ranks, but they are clearly outnumbered by the supporters of Apple, which holds a solid grip on the U.S. educational market. However, this is not the case in Canada, where, as you will read in this issue (see p. 62), Commodore is the only concern (with 67 percent of the market).

The situation confronting the U.S. school administrator and teacher is how to make the most out of the available educational money for computers. Teachers cite the low cost, inexpensive maintenance, dependability, software availability and superior graphics and sound capabilities as factors in selecting Commodores for their schools.

One second-grade teacher who is motivating her students to learn through creative uses of the C-64 states, "I can have at least six of my 28 students on the computers at one time, instead of just two with a more expensive brand." The article then goes on to discuss why, in this teacher's mind, C-64s are better suited for the classroom than Apples or IBMs.

School administrators and teachers should, of course, carefully consider how their educational dollars can best be spent. If you decide that computers in the classroom are the way to go, then Commodore computers are probably the *best* way to go, if best means low cost *and* quality. With the introduction of the C-128, in addition to the C-64, Commodore clearly offers the most capabilities for the least cost for this market.

This same sentiment, as well as the problems and frustrations that Commodore is experiencing in trying to make up ground in the educational market, are further summed up in this issue by Kathy Hurley, vice-president of Grolier, a leading educational software manufacturer:

"Commodore. . . doesn't put enough money behind its educational marketing. . . but it has a good-priced product with a lot of performance."

The above-mentioned articles all focus specifically on the educational use of computers in schools. But there's another important area that should not be overlooked—the educational use of computers in the home and the parents' responsibility for the education of their children.

This issue also presents an educational application that parents with computers can share with their youngsters. Arithme-Sketch (p. 66) is an entertaining program that teaches and rewards students while reinforcing their math skills.

db

New Bulletin Board Number

The *RUN* technical and editorial offices have recently changed locations, necessitating new phone lines and a new phone number for the RUNning Board. We invite you to give us a call at the new number, 603-924-9704, to find out the latest information about *RUN* magazine and the Commodore industry.

"Getting it up is only half the fun!"

Spitfire 40





The Best Thing Since the Real Thing

More than just a flight simulator, it is a matter of life and death with you at the controls of one of the world's most versatile aircraft. The cockpit has working dials, gauges and compass. Taking off, landing and flying are based on the Mark I Supermarine Spitfire, right down to fuel pump problems actual pilots faced while diving!

With a choice of simulator and game scenarios, the game gives any number of players a chance to shoot down enemy aircraft. You can save your log to disk, so you can record the number of kills and flight hours you've flown. Succeeding flights become tougher as your Spitfire demands more flying and fighting skill, providing a never-ending challenge.

Comes with authentic Pilot's Notes, similar to those the RAF handed out to its pilots. You'll be flying one of the most memorable planes of World War II, with a little luck, a little skill, and by the seat of your pants. On disk for your **Commodore® 64/128** computer, joystick required. **$35**
Conversions to Apple, Atari & IBM forthcoming!

For Fast Credit Card Ordering
Call Toll Free **1-800-638-9292**

AH GAMES OF STRATEGY

microcomputer games DIVISION
The Avalon Hill Game Company
A MONARCH AVALON, INC. COMPANY
4517 HARFORD ROAD • BALTIMORE, MD 21214

tcp COMMODORE

ORDERS ONLY
CALL TOLL FREE **1-800-468-9044**

Software orders over $50.00 will be shipped FEDERAL EXPRESS (yes, even with *these* prices)
You only pay TCP's standard shipping charge of $4.00 per order. This offer also valid on peripherals and accessories under 8 pounds. Orders arriving before 11:00 AM our time will be shipped out same day.*

FEDERAL EXPRESS

Computerized order entry, processing and status allow TCP to serve you faster and better!









- If through some oversight we don't have the lowest price, we would appreciate the opportunity to beat it. If we can,you will still get the benefit of our Federal Express shipping on software orders over $100.00
- We accept MasterCard, Visa, COD and mail orders.
- Purchase orders accepted from qualified corporations and institutions. Minimum order of $500.00 required.
- No sales tax on orders outside PA
- Buy with confidence. We honor manufacturer's warranty.

VISA MasterCard

To order by mail: We accept money order, certified check, personal check, Allow 2 weeks for personal check to clear.
Shipping: $4.00 for software and accessories/$10.00 for printers and color monitors/$8.00 for disk drives and other monitors/Add $3.00 per box shipped COD. Call for other shipping charges. Additional shipping required on APO, FPO, AK, HI, and foreign orders.

Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA. Manufacturer's warranty honored with copy of our invoice. **ALL SALES ARE FINAL.** Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

DATA 20 XL-80

The XL-80 is an 80 column board that plugs into the back of your C-64. It's **compatible with the Mitey Mo** modem software to give you an 80 column terminal on your C-64. Included with the XL-80 is an 80 column word processor, spreadsheet, and mailing list program.

XL-80
$59.95

XL-80 & MITEY MO Package Deal
$107.95



LEGEND PRINTERS

808.....$159
880.....$CALL
1080A....$199
1380.....$259
1385.....$295



JUKI



PRINTER/TYPEWRITER
2200 ..... $264
Daisywheel Printer, Portable Typewriter, Built in Correction Tape

PRINTERS
5510P $329
6000P ..... $CALL
6100P $344

INFODESIGNS SOFTWARE

Wordpro 3+/64, A/P, A/R, Inventory Payroll, General Ledger. Communications, Sales, Management, or Negotiation Edge.
Your Choice .....$19.95 EA

PRINTER INTERFACES

G-WIZ $49.95
MW-350 w/4K Buffer $CALL
Cardco Super G... $CALL
Xetec Supergraphix $CALL
Xetec Jr. $46.95
Grappler CD..... $87.95
Tymac Connection $67.95

PRO-LINE SOFTWARE

GT4 ..... $22.95
Fast Save, Fast Load Cartridge

C POWER
C COMPILER $69.99
CADPIC $36.95
CASHBOX.....$36.95
Wordpro 64.....$36.95
Speilpro 64.....$32.95
Mailpro 64.....$24.95
Profile 64.....$36.95
PAL 64.....$32.95
POWER 64 .....$32.95
TOOLBOX 64 ..... $59.95

SAT Preparation With HAYDEN

Prepared by Professionals

SAT Score Improvement System $59.95
Includes Preparation for Math, Reading comp., Vocabulary, Quantitative Comparisons, and Word problems

SAT Practice Test $17.95

LX-80 ..... $CALL
LX-80 tractorfeed..... $CALL
Homewriter 10.... $CALL
includes Commodore or Atari interface
FX-85 .... $CALL
FX-286 ... $CALL
DX-10 .... $CALL
DX-20 .... $CALL

EPSON

The Print Shop

Broderbund Print Shop $25.95
Print Shop Companion $CALL
Graphics Library I, II or III $16.95
120 sheet color paper refill ⅓ red,⅓ blue, ⅓ gold... $8.95

PANASONIC

1091 ... $CALL
1080 ...$199.00
1092.....$CALL
1592.....$CALL
3131 Daisywheel .....$CALL
3151 Daisywheel .....$CALL



PRINTER PACKAGES

all packages work with C64 or C128

Star SG-10 & XETEC SUPERGRAPHIX $269.95
SG-10 & Xetec Supergraphix jr $254.95
SG-10 & Cardco G-Wiz.....$259.95
SG-10 & MW-350 .....$269.95
SG-15 & Xetec Supergraphix $419.95
SG-15 & Cardco G-Wiz.....$412.95
SD-10 & Xetec Supergraphix $379.95

PANASONIC
1091 & Xetec Supergraphix $289.95
1091 & Xetec Supergraphix Jr. $265.95
1080 & Xetec Supergraphix $264.95
1092 & Xetec Supergraphix $359.95

MODEMS — MODEMS — MODEMS



MASTER MODEM $39.95
Includes Dow Jones, Compuserve Time
VOLKS 6470 300/1200 BAUD .$154.95
1670.....$157.95
1660.....$CALL
MITEY MO $59.95
VIP TERMINAL.....$34.95
VIDTEX TERMINAL..$23.95
Compuserve Starter Kit ..$19.95
Playnet Starter Kit $14.95

FREE PlayNET
STARTER KIT WITH PURCHASE OF ANY MODEM
(WHILE SUPPLY LASTS)

Printer Closeouts!

NEC 8027A
105 CPS, Friction and tractor feed
Works with Print Shop!
$139

cardco LQI Daisywheel
$179

TUSSEY COMPUTER PRODUCTS

P.O. BOX 1006
STATE COLLEGE, PA 16804

128 CLASSIFIEDS

INFORMATION AND PA ORDERS 814-234-2236

OPEN 9-8 Mon-Fri; 10-5 Sat EAST COAST TIME

GAMES

BEST SELLING GAMES

Hitchhiker's guide	$22.95
F-15 Strike Eagle	$21.95
Karateka	$19.95
Kung Fu (Spinnaker)	$call
Flight Simulator II	$32.95
FS II Scenery disks	$15.95
Jet	$29.95
Microleague Baseball	$27.95
Microleague general manager disk	$27.95
Microleague 1985 teams	$15.95
Hobbit	$call
Sargon III	$37.95
Murder by the Dozen	$24.95

ACTIVISION

Alcazar	$19.95
Borrowed Time	$19.95
Computer Fireworks Celebration	$19.95
Countdown to shutdown	$19.95
Fast Tracks Slot Car Const	$19.95
Garry Kitchen's Gamemaker	$24.95
Great Amer RR	$22.95
Hacker	$19.95
Little Computer People	$24.95
Master Of Lamps	$19.95
Mindshadow	$19.95
Pitfall II: Lost Caverns	$19.95
Space Shuttle	$19.95

BRODERBUND

Championship Lode Runner	$24.95
Karateka	$19.95
Lode Runner	$24.95
Music Shop	$29.95

BLUE CHIP

Baron	$24.95
Millionaire	$24.95
Tycoon	$24.95

ELECTRONIC ARTS

CALL FOR OUR LOW PRICE ON ALL ELECTRONIC ARTS PRODUCTS!!!

EPYX

Summer Games	$26.95
Summer Games II	$26.95
Winter Games	$27.95
Vorpal fast loader	$call

Call for prices on other EPYX products!!!

INFORCOM

Cut Throats	$22.95
Deadline	$25.95
Enchanter	$25.95
Hitchhiker's Guide	$22.95
Infidel	$29.95
Invisiclues	$6.95
Planetfall	$25.95
Sorcerer	$29.95
Spellbreaker	$29.95
Suspect	$29.95
Wishbringer	$25.95
Witness	$25.95
Zork I	$22.95
Zork II	$26.95
Zork III	$26.95

MINDSCAPE

Bank Street Music Writer	$27.95
Bank Street Storybook	$27.95
Castle Clobber	$18.95
Halley Project	$27.95
Indiana Jones	$22.95
Quake minus one	$17.95
Shadowfire	$17.95
The Perfect Score: Prep for Sat	$49.95
The Lords of Midnight	$17.95

CALL FOR PRICING ON OTHER MINDSCAPE PRODUCTS

MICROPROSE

Acrojet	$24.95
Crusade in Europe	$27.95
Decision in the Desert	$27.95
F-15 Strike Eagle	$21.95
Gunship	$24.95
Conflict in Vietnam	$call
Hellcat Ace	$21.95
Kennedy Approach	$24.95
NATO Commander	$24.95
Silent Service	$24.95
Solo Flight	$24.95
Spitfire Ace	$21.95
Top Secret	$24.95

SIMON & SHUSTER

G.I. Paper Airplane const	$call
JK Lasser's Income Tax guide	$39.95
Kermit's Story Maker	$19.95
NY Times Crossword Puzzle Vol. 1 or 2	$14.95
Spy Hunter	$31.95
Star Trek-Kobayashi alt	$29.95
Typing Tutor III	$29.95

SPINNAKER

Adventure Creator	$22.95
Alphabet Zoo	$16.95
Cosmic Combat	$call
Delta Drawing	$19.95
Facemaker	$19.95
Hey Diddle Diddle	$16.95
Homework Helper	$call
In search of the most amazing thing	$18.95
Kung Fu	$CALL
Snooper Troops I or II	$18.95

Call for Prices on other SPINNAKER Software

STRATEGIC SIMULATIONS

CALL FOR OUR LOW PRICE ON ALL SSI GAMES.

MISCELLANEOUS

C-64 WORD PROCESSORS

Paperback Writer	$call
Bank Street Writer	$call
Bank Street Speller	$34.95
Font Master II	$34.95
Wordpro 64	$36.95
Spellpro 64	$32.95
Wordpro 3+/64	$19.95
Fleet System II	$call
Paperclip	$37.95
Paperclip w/spellpack	$49.95
Mirage Professional WP	$36.95
Trio	$call
Kid Pro Qyo	$32.95

C-64 DATABASES

Bank Street Filer	$34.95
Consultant	$39.95
Mirage Database w/Report gen	$36.95
Profil 64	$36.95
File Now	$call
Practifile	$call

C-64 SPREADSHEETS

Vizastar 64	$79.95
Pracitcal(d) or (t)	$call
Calkit	$39.95
Hes Multiplan	$29.95
PS, The Programmable Spreadsheet	$19.95
Calc Result Adv (d,c)	$67.00

MONOCHROME MONITORS

(Composite Input)

NEC 1205 12" amber w/sound	$89.95
Goldstar MBM2233 12" amber	$79.95
Goldstar 12" green	$79.95
Zenith 1220 amber flat screen	$99.95
Zenith 1230 green flat screen	$99.95
Din to RCA phono jack cable	$6.95
RGB to RCA phono jack cable	$9.95

COLOR MONITORS

SAMSUNG 14" Color composite	$139.00
Taxan 220 Color composite, sep. video	$169.00
Sakata SC-100	$149.00

CARDCO

Numeric keypad	$34.95
5 slot cart. exp	$54.95
S'more Basic	$49.95

UTILITIES

Merlin 64	$34.95
Fast Load	$24.95
Pal 64	$32.95
Power 64	$32.95
Toolbox 64	$59.95
CSM 1541 align	$34.95
Mach 128	$call
C Power	$69.95

C-64 INTEGRATED PACKAGES

Vizastar 8K	$79.95
Trio	$call
Homepack	$39.95

MISCELLANEOUS

Estate power supply for C-64	$
Koalapad	$59.95
Koala Gibson Light pen	$49.95
Naverone 3 Slot expander	$27.95

GRAPHICS

Print Shop	$25.95
Graphics Library I, II, or III	$16.95
Newsroom	$34.95
Clip Art I	$19.95
Clip Art II	$call

Financial & Accounting

Softsync Pers. Acct	$32.95
Cont. Home Acct.	$46.95
Timeworks General Ledger, A/R, A/P, Payroll, Inventory	$40.95 each
Infodesigns General ledger, A/P, A/R, Payroll, Inventory	$call
Cashbox	$36.95

ALSO IN STOCK . . .
Software from Access, Addison-Wesley, Broderbund, CBX, Epyx, Hayden. Call for Price and Availability.

COMMODORE 128= HARDWARE

1670. . . . $157.95



C128
1571, 1572 DRIVES
1902 MONITOR
MPS 1000 PRINTER
1350 MOUSE
1700, 1750 RAM EXPANSION

CALL NOW FOR LOWEST PRICES

SAVE A BUNDLE ON A BUNDLE
PACKAGE DEALS AVAILABLE
CALL FOR DETAILS

COMMODORE 128= SOFTWARE

WORD PROCESSORS

VIZAWRITE 128	$LOWEST PRICE CALL
WORDPRO 128	$59.95
PAPERCLIP	$37.95
PAPERCLIP W/SPELLPACK	$49.95
WORD WRITER 128 W/SPELLER	$49.95
PERFECT WRITER	$CALL
Paperback Writer 128	$call

SPREADSHEETS

EPYX MULTIPLAN 128	$44.95
PERFECT CALC	$CALL
SWIFTCALC 128 W/SIDEWAYS	$49.95
VIZASTAR 128	$CALL

Integrated Spreadsheet, Database, Graphics

MISCELLANEOUS 128 SOFTWARE

PERFECT FILER	$CALL
JANE	$32.95
SUPERBASE 128	$69.95
CONSULTANT 128	$39.95
Sylvia Porter's Financial Planner	$CALL
Data Manager II	$49.95
Mach 128 from Access	$34.95

NEW TITLES EVERY DAY!
CALL FOR LATEST INFORMATION!

STAR MICRONICS INC

SG-10	$CALL
SL-10C	$226

Commodore ready

SG-15	$364
SD-10	$323
SD-15	$449
POWERTYPE	$299

18cps daisywheel

SR-10, SR-15	$CALL



ENHANCER 2000 1.

$159 DISK DRIVE

1 YEAR WARRANTY

RGBi/COMPOSITE MONITORS

Magnavox 8562 . . . $CALL
2 year warranty, all cables to 128 included. Monochrome mode available at flick of switch

Thompson Monitor $CALL
4 modes of operation. All cables to 128 included.

SEIKOSHA

SP-1000 VC . . . $CALL
Commodore ready, NLQ mode, friction and tractor feed standard.

SP-1000 . . . . . $CALL
Centronics parallel version of above printer

XETEC inc.

SUPER GRAPHIX interface w 8K buffer, down loadable fonts
$ lowest price

SUPERGRAPHIX jr printer interface. . $46.95

Font Master II . $34.95

CMS

General Acct System

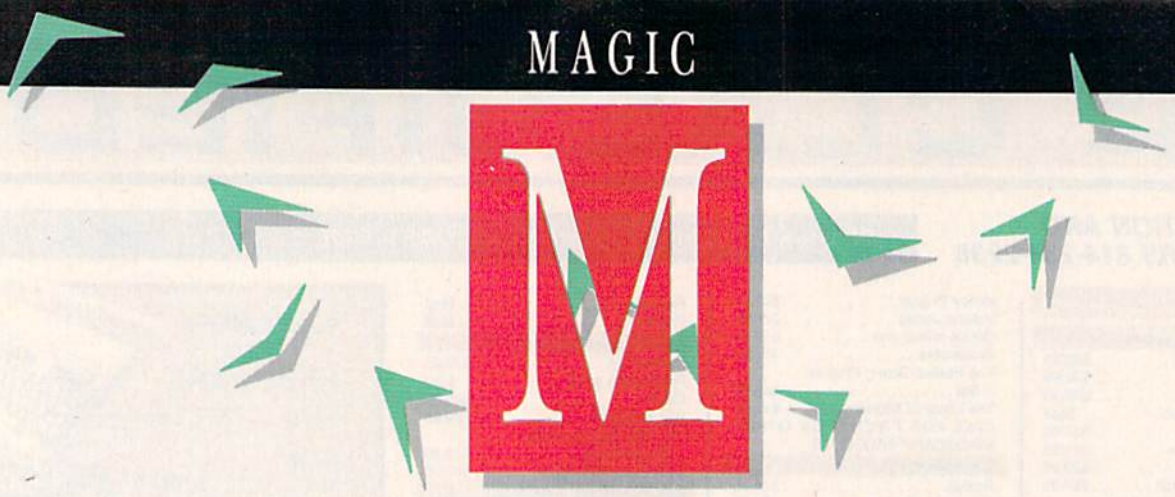
INCLUDES ☐ General Ledger ☐ Accts Receivable ☐ Billing Statements ☐ Accts Payable, Check Writing ☐ Payroll

TOTAL PRICE $134.95

ORDERS ONLY...CALL TOLL FREE 1-800-468-9044

tcp

MAGIC



Compiled by LOUIS F. SANDER

MAGIC is tricks, MAGIC is fun. MAGIC is doing what cannot be done.

Every month, Magic brings you brief and useful computer tricks from around the world—tricks to make computing easier, more enjoyable or more exciting. We number our tricks in hex, the counting system of sorcerers and computerists.

Magic solicits your simple hardware ideas, short programs, useful programming techniques, little-known computer facts and similar items of interest. We look for new or recycled material that can be implemented with a minimum of time, effort or theoretical knowledge and that is of current value to Commodore computerists (Plus/4 and C-16 owners, too). RUN will pay up to $50 for each trick accepted. Send your tricks to:

MAGIC
RUN Magazine
80 Pine St.
Peterborough, NH 03458

If you enclose a self-addressed stamped envelope, we'll send you a Trick Writer's Guide. Readers outside the United States may omit the stamp.

June, the conventional wisdom says, signifies the start of a slow time for computing. But mark Magic's mighty mailbox; the truth is indeed the opposite—our summer mail is the heaviest of the year. So behold a surely proven truth: the Siren Song of Silicon transcends the Lure of the Great Outdoors.

What you see below was created while Winter held her icy grip, and while long, dark nights gave plenty of time to refine and polish the Magic. It's heavy in telecommunications and practical programs, plus the usual dose of amusements. As always, we know you'll enjoy it.

$2EF File finder—This routine can be used to check for the presence of a given file on the disk and to determine whether the disk is write-protected. It's useful to make such checks before attempting to manipulate a potentially unavailable file.

If the file named Filename is not on the disk, line 130 will give an error 62, File Not Found. If the disk is write-protected, that line will give an error 26, Write Protect On.

If you don't need to check for write protection, replace the Open statement's A (for append) with an R (for read).

```
100 REM FILE FINDER - LOUIS F. SANDER
110 OPEN2,8,2,"FILENAME,P,A":CLOSE2
120 OPEN15,8,15:INPUT#15,A,B$:CLOSE15
130 IFA>1THENPRINTA,B$:END
140 PRINT"THE FILE IS ON THE DISK"
```

Louis F. Sander
Pittsburgh, PA

$2F0 GET with flashing cursor—This routine provides a blinking cursor for the Get statement. It doesn't have the cursor footprint problems usually inherent in such routines, and it allows input from all keys, including the cursor, delete and color keys. The routine works as is on the VIC, C-64 and in both modes on the C-128.

```
1000 REM MAGIC GET W/CURSOR - ED HORGAN
1010 REM FOR C64,VIC,C128 IN BOTH MODES
1020 X=235:Y=236:IFFRE(0)=FRE(1)THENX=214:Y
     =211
1030 Z=1024+PEEK(X)*40+PEEK(Y):ZZ=PEEK(Z)
1040 POKEZ,160:GETA$:POKEZ,ZZ:IFA$=""THEN10
     40
1050 PRINTA$;:B$=B$+A$:IFA$=CHR$(13)THENGOT
     O1070
1060 GOTO1030
1070 PRINTB$;"REST OF PROGRAM GOES HERE"
```

Edward Horgan
Coatesville, PA

$2F1 Datapointer for the C-64—This program sets up a machine language routine that can set the data pointer to any Data statement you choose, regardless of its line number. This eliminates the need for arrays to hold data the program already contains, letting you write smaller programs with faster execution and starting.

Once the machine language is in memory, load the Basic program containing the Data statements you need to access. To access the Nth Data statement in the program, just make the indicated Poke and SYS call, then execute a Read statement. You are limited to 255 Data statements, if you consider that a limit.

Datapointer accesses statements rather than individual data items, but once a statement has been accessed, your program can read all the items it contains. Data statements can, of course, stand by themselves or be embedded within multi-statement lines. It's fastest to put them at the beginning of your program.

```
100 PRINT"{SHFT CLR}MAGIC C64 DATAPOINTER -
    EDWARD G. BELL"
```

→

Circle 3 on Reader Service card.

(No I.D. required for half-elves.)

When the Going Gets Tough, the Bard Goes Drinking.



And the going is tough in Skara Brae town. The evil wizard Mangar has cast an eternal winter spell. Monsters control the streets and dungeons beneath. Good citizens fear for their lives. What's worse, there's only one tavern left that serves wine.

But the Bard knows no fear. With his trusty harp and a few rowdy minstrel songs he claims are magic, the Bard is ready to boogie. All he needs is a band of loyal followers: a light-fingered rogue to find secret doors, a couple of fighters to bash heads, a conjurer to create weird allies, a magician for magic armor.

Then it's off to combat, as soon as the Bard finishes one more verse. Now what's a word that rhymes with "dead ogre?"



4 classes of magic user, including wizard and sorceror. 85 new magic spells in all.



128 color monsters, many animated. All challenging.



Full-color scrolling dungeons. 16 levels, each better than the one before. 3-D city, too.

Optional use of characters created in Wizardry® or Ultima III.®

The Bard's Tale™

from

ELECTRONIC ARTS™

Specs: 100% machine language, 400K worth on 2 disks. 64K RAM minimum; enhanced for 128K. Now available for Apple II family for $44.95, C-64 & 128 for $39.95.
To order: Visit your retailer or call (800) 227-6703 (In Calif. call (800) 632-7979) for VISA or MasterCard orders. To purchase by mail, send check or money order to Electronic Arts, P.O. Box 306, Half Moon Bay, CA 94109. Add $3 for insured shipping and handling. Allow 1-4 weeks for delivery. The Bard's Tale is worth the wait.

Apple is a trademark of Apple Computer. Wizardry is a registered trademark of Sir-Tech Software, Inc. Ultima is a registered trademark of Richard Garriott. The Bard's Tale and Electronic Arts are trademarks of Electronic Arts. For a copy of our complete catalogue and direct order form, send $.50 and a stamped, self-addressed envelope to Electronic Arts, 2755 Campus Drive, San Mateo CA 94403.

Listing continued.

```
11Ø FORJ=1TO82:READK:CS=CS+K:NEXT:RESTORE:I
    FCS<>11Ø53THENPRINT"DATA ERROR":END
12Ø FORJ=679TO76Ø:READK:POKEJ,K:NEXT
13Ø PRINT"{CRSR DN}TO GET NEXT DATA FROM TH
    E NTH STATEMENT,"
14Ø PRINT"READ IT AFTER POKE254,N:SYS679"
141 DATA169,ØØØ,133,251,169,Ø08,133,252
142 DATA16Ø,Ø05,162,ØØ1,177,251,2Ø1,131
143 DATA24Ø,Ø14,Ø32,23Ø,ØØ2,2Ø1,Ø32,24Ø
144 DATA243,2Ø1,Ø58,24Ø,239,Ø24,144,Ø15
145 DATA228,254,2Ø8,ØØ7,132,Ø65,165,252
146 DATA133,Ø66,Ø96,232,Ø32,23Ø,ØØ2,177
147 DATA251,Ø32,23Ø,ØØ2,2Ø1,Ø58,24Ø,212
148 DATA2Ø1,ØØØ,24Ø,ØØ9,Ø76,214,ØØ2,2ØØ
149 DATA2Ø8,ØØ2,23Ø,252,Ø96,152,Ø24,1Ø5
15Ø DATAØØ4,144,ØØ3,Ø24,23Ø,252,168,Ø24
151 DATA144,186
```

Edward G. Bell
Swissvale, PA

$2F2 C-64 line counter—This relocatable program for the C-64 and VIC gives an accurate count of the lines in any Basic program. It is useful, among other things, for determining how many lines to list on each page of a printout. To use the line counter, load and run it, taking careful note of the SYS command on the screen. Then load the program whose lines are to be counted and execute the SYS.

```
1ØØ PRINT"{SHFT CLR}MAGIC LINE COUNTER - JA
    MES PELLECHI"
11Ø SA=828:PRINT"{CRSR DN}SYS";SA;"TO COUNT
    ":REM RELOCATABLE!
12Ø FORJ=ØTO41:READK:CS=CS+K:NEXT:RESTORE:I
    FCS<>7462THENPRINT"DATA ERROR":STOP
13Ø FORJ=ØTO41:READK:POKESA+J,K:NEXT
14Ø DATA165,Ø43,133,251,165,Ø44,133,252
15Ø DATA16Ø,ØØØ,132,253,132,254,177,251
16Ø DATA17Ø,2ØØ,177,251,24Ø,Ø13,23Ø,253
17Ø DATA2Ø8,ØØ2,23Ø,254,134,251,133,252
18Ø DATA136,24Ø,235,165,254,166,253,Ø76
19Ø DATA2Ø5,189
2ØØ REM ABOVE IS FOR C-64. FOR VIC-2Ø, ADD
    LINE 21Ø POKESA+41,221
```

James Pellechi
Middle Island, NY

$2F3 Printer-width fix—This C-64 and VIC-20 program lets you print program listings in any desired width. With it, you can use any size paper for your listings, or you can leave wide right margins for comments.

The first printed line of any program line is flush with the left margin, while succeeding lines are indented any number of spaces you choose. Default values are 64 column listings, with four-space indentation of unnumbered lines. They can be changed by Poking as indicated in the program.

To use the program, run it, load the program to be listed, then Poke 807,3. Simultaneously pressing the run/stop and restore keys will disable the special listing mode.

```
1ØØ PRINT"{SHFT CLR}MAGIC PRINTER WIDTH FIX
     - JAMES F. LEES":REM C64 & VIC
11Ø FORJ=1TO57:READK:CS=CS+K:NEXT:RESTORE:I
    FCS<>7554THENPRINT"DATA ERROR":STOP
12Ø FORJ=957TO1Ø13:READK:POKEJ,K:NEXT:SYS95
    7
13Ø PRINT"{CRSR DN}POKE 976,PRINT WIDTH{2 S
    PACEs}(NOW";PEEK(976);"{CRSR LF})"
14Ø PRINT"{CRSR DN}POKE 989,INDENTATION{2 S
    PACEs}(NOW";PEEK(989);"{CRSR LF})"
15Ø PRINT"{CRSR DN}POKE8Ø7,3 ENABLES, STOP/
    RESTORE KILLS."
151 DATA173,Ø38,ØØ3,141,238,ØØ3,173,Ø39
152 DATAØØ3,141,239,ØØ3,Ø96,Ø72,2Ø1,Ø13
153 DATA24Ø,Ø33,169,Ø64,197,252,2Ø8,Ø21
154 DATA169,Ø13,Ø32,237,ØØ3,132,253,16Ø
155 DATAØØ4,132,252,169,Ø32,Ø32,237,ØØ3
156 DATA136,2Ø8,25Ø,164,253,23Ø,252,1Ø4
157 DATAØ76,ØØØ,ØØØ,169,255,133,252,2Ø8
158 DATA244
```

James F. Lees
Dayton, OH

$2F4 Tempo and the metronome—While the tones in computer music are usually faithful to the composer's intent, there's often something wrong with the music's speed, or tempo. There's no need for such a discrepancy, because the proper tempo is always specified on the sheet music by an Italian word such as Largo, Andante or Allegro. Musicians know the meanings of these words, but, unfortunately, computers don't.

Luckily, much sheet music also includes a numerical metronome setting that the computer can easily digest. The setting is found at the start of the piece, usually in the form:

M.M. [note] = [number]

The M.M. stands for Maelzel's Metronome. (Maelzel developed the first one in the early 19th century.) The [note] will be the symbol for the note, usually a quarter note or half note, which is counted as one beat in the time signature of the piece. The [number] signifies the number of beats per minute, often somewhere between 60 and 80, but with a practical range of about 50–120.

When you establish the tempo for your computer music, just be sure there are the appropriate number of notes per minute of music played.

On the C-128, the Tempo statement can be used for this, if you know the following formulas:

TEMPO = beats per minute / note value / 3.12

beats per minute = TEMPO × note value × 3.12

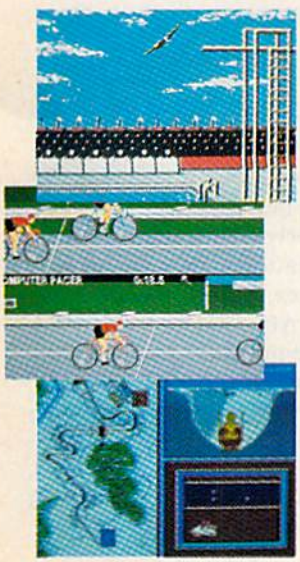
TEMPO is the appropriate argument for the Tempo statement, while note value is 1 for a whole note, 2 for a half note, 4 for a quarter note, and so on. The note value and number of beats per minute are, of course, taken from the metronome setting.

While the Tempo statement takes arguments from 1–255, only those in the lowest part of that range are useful in making music. Using a quarter note for one beat, Tempos from four to ten cover the range of 49 to 124 beats per minute. Using a half note for one beat, Tempos from 8–20 cover the same range.

Jean Patterson
Pittsburgh, PA

$2F5 C-128 error trapping—When programming the C-128, add the following three lines, numbered exactly as shown. If your program encounters an error, these lines will tell you what kind it is and where it is. The offending line will even be listed to the screen.

22 FAST-PACED, EXCITING EVENTS. GO FOR THE GOLD!



SUMMER GAMES.®
Want some great play action? This award winning best seller brings you eight great events, including Swimming, Diving, Track, Gymnastics, and more. Compete against world records. Or get together with a group of up to eight for some good competitive *fun*. Realistic, graphics and *action* will challenge you again and again to *go for the gold*.

SUMMER GAMES II.™
You asked us for more great events. Here they are. Rowing, Triple Jump, Javelin, High Jump, Fencing, Cycling, Kayaking, even Equestrian. Like SUMMER GAMES, you get spine tingling *action and challenge* for one to eight players. These aren't just games. They're *the games*. And you're the star.

WINTER GAMES.™
You've got to see the graphics, and *feel* the knot in your stomach as your bobsled careens along the walls of the run to know why people are wild over WINTER GAMES. Seven events give you a variety of action—from the endurance of the Biathlon to the timing of the Ski Jump, and more.

What are you waiting for?
Play your favorite events over and over. Play all 22. Set up teams. Challenge your friends. These great action-strategy games are sure to be the stars of *your* collection.

At your local Epyx dealer.

	APPLE	MAC	ATARI	ATARI ST	C64/128	AMIGA
Summer Games	✓		✓		✓	
Summer Games II	✓				✓	
Winter Games	✓	✓		✓	✓	✓



EPYX® COMPUTER SOFTWARE
1043 Kiel Ct., Sunnyvale, CA 94089

Circle 12 on Reader Service card.

```
Ø TRAP63999:REM MAGIC - A.OZERKOVSKY
63998 PRINT"THE PROGRAM IS OK!":END
63999 PRINTERR$(ER);" ERROR IN LINE";EL:HEL
      P
```

Alejandro Ozerkovsky
Mexico City
Mexico

$2F6 C-128 terminal program—This little gem demonstrates the power and flexibility of the mighty C-128. Where else can you find a terminal program that fits on a single line?

```
1Ø REM MAGIC C128 TERMINAL - J.PAYNE
2Ø POKE56577,Ø:POKE56579,38:OPEN1,2,3,CHR$(
   6)+CHR$(Ø):DO:GETA$:GET#1,B$:IFA$<>""THE
   NPRINT#1,A$;:LOOP:ELSEIFB$<>""THENPRINTB
   $;:LOOP:ELSELOOP
```

Jim Payne
Dover, DE

$2F7 C-128 function keys—This bit of magic lets you redefine the C-128's help key and shifted run/stop keys, as long as you run it before any of the function keys have been redefined. If you want the new definition to include a carriage return, use the left-arrow key where you want the return to appear.

If you know how the function keys are set up in memory, you can modify the program to accommodate your creative wishes. Locations 4096–4351 are reserved for the function keys. Locations 4096–4105 hold the lengths of each key definition, from f1 through f8, then shifted run/stop, then help. The definitions themselves are stored from 4106–4351.

Basic's Key command manages the first eight definitions, while a program such as this can manage the ninth and tenth.

You can save the setups for all ten keys by using

```
BSAVE "filename", P4096 TO P4351
```

They can be reloaded at any time by

```
BLOAD"filename"
```

```
1Ø PRINT"{SHFT CLR}MAGIC EXTRA C128 F-KEYS
   - GARY KEMPER"
2Ø INPUT"{CRSR DN}RUN/STOP KEY DEFINITION";
   R$
3Ø INPUT"{CRSR DN}{4 SPACEs}HELP KEY DEFINI
   TION";H$
4Ø POKE41Ø4,LEN(R$):POKE41Ø5,LEN(H$)
5Ø FORJ=1TOLEN(H$+R$)
6Ø B=ASC(MID$(R$+H$,J,1))
7Ø IFB=95THENB=13
8Ø POKE4158+J,B
9Ø NEXT
```

Gary Kemper
Azusa, CA

$2F8 Halley's Comet revisited—If you missed the prime viewing period for our once-in-a-lifetime visitor, this C-64 program can show you what you missed. It gives a computer-enhanced image of the famous heavenly body, complete with color and sound.

```
1Ø PRINT"{SHFT CLR}{CTRL 2}HALLEY'S COMET -
    TAMMY SILVERBERG/MAGIC"
2Ø POKE53281,Ø:FORJ=1TO52:PRINTTAB(5)"{6 SP
   ACEs}*{6 SPACEs}*{3 SPACEs}";:NEXT:PRINT
   "{HOME}"
3Ø S=54272:FORJ=ØTO24:POKES+J,Ø:NEXT:POKES+
   24,15:POKES+1,1:POKES+5,22Ø
4Ø V=53248:FORJ=ØTO62:READK:POKE832+J,K:NEX
   T:POKE2Ø4Ø,13:POKEV+21,1:POKEV+28,1
5Ø POKEV+37,7:POKEV+38,2:POKEV+39,8:POKES+4
   ,129
6Ø FORX=1TO255STEP.5:POKEV+1,255-X:POKEV,X:
   NEXT
61 DATA ØØØ,ØØØ,252,ØØØ,Ø15,255,ØØØ,Ø15
62 DATA 255,ØØØ,Ø63,255,ØØØ,Ø63,255,ØØØ
63 DATA Ø63,255,ØØØ,247,255,ØØØ,223,252
64 DATA ØØØ,125,124,ØØØ,117,24Ø,ØØ1,Ø95
65 DATA 192,ØØ1,Ø93,ØØØ,ØØ1,Ø84,ØØØ,ØØ5
66 DATA Ø8Ø,ØØØ,ØØ6,Ø64,ØØØ,Ø22,Ø64,ØØØ
67 DATA 17Ø,ØØØ,ØØØ,168,ØØØ,ØØØ,16Ø,ØØØ
68 DATA ØØØ,ØØØ,ØØØ,ØØØ,ØØØ,ØØØ,ØØØ
```

Tammy Silverberg
Brooklyn, NY

$2F9 Super-simple scheduling program—I'm in charge of scheduling and reservations for our Lions Club hall. I used a paper calendar for six months, but with all the reservations, cancellations and conflicts, I decided to put my computer to use. I started by writing a Basic program using Data statements. However, with our very heavy schedule, the program became monstrous and time-consuming.

I finally came up with a program that contains only one executable line and operates in real time. I don't know that it is unique, but in my computer-conscious small community, no one has ever seen the like.

The secret is to use one line for each day, with the line number consisting of a 1 followed by the month and day in four-digit form. The line number for June 8 would be 10608; for Halloween, it would be 11031; and so on. After some dates have been scheduled, the program might look like this:

```
10 LIST 10000-
10112 BINGO TONIGHT
10113 SWIM PARTY AT 8:00
10114 LUNCHEON
```

and so on, with up to 80 characters per line.

The beauty of the program is that lines are never executed, so they needn't be syntactically correct. To access the lines, you simply load and run the program. You can make monthly or quarterly printouts by listing to the printer. If all your information won't fit on one line, end the line with SEE xxxxx, where xxxxx is an unused line number above 20000. After a date has passed, you may delete it by typing its line number; you can then save the file by using the Save with Replace command.

If you adopt this system for your own purposes, be careful not to use question marks in your entries, since the computer will convert them to Print statements. Also, to guard against reserving the same date twice, always list the program before making a new entry.

John T. McClennan
Point Arena, CA



Another Great Simulation from Sid Meier – Author of F-15 Strike Eagle

Now he takes you from the cold, thin air and limitless space of F-15 Strike Eagle down into the dark depths of the Pacific Ocean inside an American World War II submarine for a realistic, action-filled simulation —

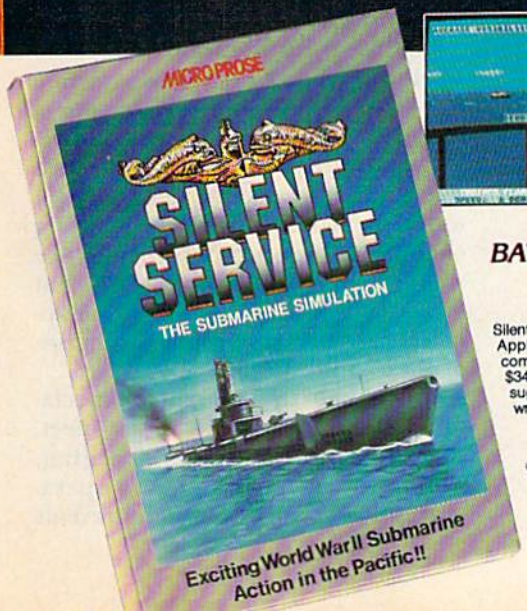
SILENT SERVICE



Thrill to the initial sighting of the enemy's strike force in your periscope as their ships come into your range. But watch out — the enemy's escorts have just sighted you. You're the **hunter** — but suddenly — you've become the **hunted!**

As Commander, you must sink their ships and keep your submarine from being destroyed — if you can. Will you select a quiet patrol sector in the Marianas Islands or choose the dangerous waters off the coast of Japan? Is a submerged daylight periscope attack best or do you charge in on the surface at night using only radar bearings to guide you? Do you fire a spread of your precious torpedoes or can you close the range and pick off the enemy with a single torpedo shot? These decisions and many more are yours to make as you take your place among the elite ranks of the **SILENT SERVICE!**

It's **exciting** — and it's **fun.** It's another great Micro Prose simulation — and it's called **SILENT SERVICE.** Look for it now on your dealer's shelves.



FIVE AUTHENTIC BATTLE STATION SCREENS

Silent Service is available for Commodore 64/128, Apple II Family, Atari XL/XE, IBM PC/PC Jr. computers for a suggested retail of only $34.95. Available soon for Macintosh for a suggested retail of only $39.95. Call or write for more information or MC/VISA orders.

COMMODORE, APPLE, ATARI, IBM, and MACINTOSH, are registered trademarks of Commodore Business Inc., Apple Computer Inc., Atari Inc., and International Business Machines Inc., respectively.

Photo courtesy Baltimore Maritime Museum

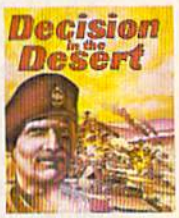
Try These Other Real Life Simulations



Daring Attack Helicopter Action in the AH-64 Apache!



Thrilling Decathalon of aerobatic events in your own personal jet!!



You are in command — North Africa 1940-1942

MICRO PROSE
SIMULATION • SOFTWARE

120 LAKEFRONT DRIVE • HUNT VALLEY, MD 21030 • (301) 667-1151

Circle 68 on Reader Service card.



Compiled by SUSAN TANONA

Chem Lab

B

Here's a Chance To Brush Up on Your Lab Skills

From the moment you pick up the manual, you can't help but be impressed with Chem Lab. The hard cover opens to reveal a spiral binding with 70 pages of well-organized instructions.

It's clear that Chem Lab's authors are trying very hard to make chemistry fun. Fifty experiments are presented as mystery problems with catchy names that defy association with more traditional concepts of scientific instruction. Rats, Bar Exam and A Steely Deal are but three of the problems presented to allow you to sharpen your lab skills.

Touted as "a chemistry set inside your computer," with no mess to clean up afterward, Chem Lab is an innovative way to introduce youngsters to the names of the elements and some of the basic concepts of chemistry.

After choosing an experiment from one of three levels of difficulty, you must accurately type in your selection before the program will proceed. Chem Lab only accepts your instructions when the names of the elements are correctly spelled or represented by the accurate chemical formulas.

To begin an experiment, you must first select the proper equipment. A robot arm, controlled by the cursor keys, positions beakers, condensers, dryers and other glassware atop your lab bench. Another robot arm is used to transfer gases, pour liquids and scoop solids. These devices are colorfully represented by graphics figures that move about the screen to the accompaniment of various musical clicks and bleeps.

Once you've equipped your lab, you may begin to mix chemicals. Three menus list the liquid, solid and gaseous elements available for each experiment. Liquids squirt colorfully from the spigot into beakers and flasks. You must carry solids from a dispenser to a container, and gases are piped from a complex of storage tanks.

You can encourage chemical reactions by applying the flame of a burner to the bottom of a vessel or by superheating or pressurizing the entire laboratory. Gases produced can be purified, condensed to a liquid or simply collected, depending on your choice of labware.

Chemistry is a field where failure is sometimes more spectacular than success. While Chem Lab never fills the house with smoke, it does allow the budding chemist to fail. Failures usually rate a short message and the opportunity to begin again. Unfortunately, there's no avoiding the tedious trips to the storeroom for equipment or the other preliminary steps that paved the way to your last mistake.

While this might only be a minor complaint, the frequency with which failures occur points to a serious shortcoming. Repeating failed experiments can be both tedious and frustrating. In addition, Chem Lab offers very little assistance in solving the problems and completing the experiments.

Extensive instructions on how to operate the program make starting out easy, but neither the documentation nor the program provide tutorial information adequate to turn this game into a serious educational tool. Chem Lab offers the budding chemist an opportunity to practice what he or she already knows, but someone who doesn't have an appetite for the elements may soon tire of these blind trials.

Chem Lab raises higher expectations than it seems able to meet. Despite sophisticated packaging, wonderful graphics and easy operation, this package eventually reveals

Report Card

A ***Superb!*** An exceptional program that outshines all others.

B ***Very Good.*** One of the better programs available in its category. A worthy addition to your software library.

C ***Good.*** Lives up to its billing. No hassles, headaches or disappointments here.

D ***Mediocre.*** There are some problems with this program. There are better on the market.

E ***Poor.*** Substandard, with many problems. Should be deepsixed!

Fleet System 2.™
Word processing that *spells* V-A-L-U-E.



Complete word processing with built-in 90,000 word spell checking - Only **$69.95**

Up till now, you'd have to spend a minimum of about $70 to get a good word processor for your Commodore 64™/128™. And if you added a small, *separate* spell checking program, you'd be out well over $100!

Now there's Fleet System 2! It's two powerful programs in one, and it's perfect for book reports, term papers or full office use.

Fleet System 2 combines the EASIEST and most POWERFUL word processor available with a lightning-fast 90,000 word spelling dictionary — all in one refreshingly EASY TO USE integrated system. Finally, spell checking is now available at your fingertips.

You can even add over 10,000 "custom" words to the built-in 90,000 word dictionary. And at a suggested retail price of $79.95, Fleet System 2 really spells V-A-L-U-E, and 90,000 other words too!

Fleet System 2 helps people of all ages to learn to *spell correctly* and *write better* too. It's the ONLY full featured word processor that provides you with helpful writing and VOCABULARY FEEDBACK such as: the total number of words in your document, the number of times each word appears, and total number of "unique" words, just to name a few.

Fleet System 2 has every important feature that will help you make child's play out of the most heavy duty typing tasks. There's Built-in 80 Column Display — so what you see is what you get, Horizontal Scrolling During Typing, Easy Correction and Movement of Text, Page Numbering, Centering, Indenting, Headers and Footers, Math Functions, Search and Replace, Mail Merge, BUILT IN 90,000 word SPELL CHECKING and much, much more!

Ask for Fleet System 2. Exceptionally Easy. Packed with Power. Perfectly Priced.

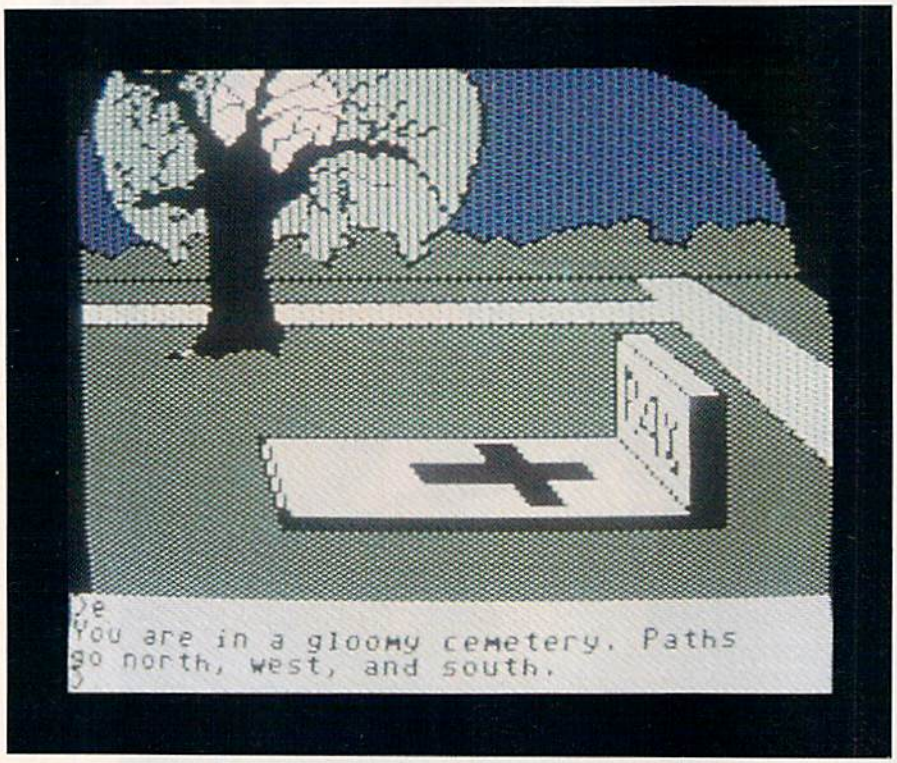


UNITED STATES COMMODORE USERS GROUP APPROVED

PSI Call 1-800-343-4074 for the Dealer nearest you!
Professional Software, Inc., 51 Fremont Street, Needham, MA 02194 (617) 444-5224

Fleet System 2™ is a trademark of Professional Software, Inc. — Fleet System 2™ was designed and written by Visiontronics, Ltd. — Commodore 64™ and Commodore 128™ are trademarks of Commodore Electronics Ltd. — Some printers may not support certain Fleet System 2 functions and/or require an interface. Please check with your dealer. — Dealer and Distributor inquiries are invited.

Circle 93 on Reader Service card.



Penguin Software's Transylvania.

itself to have only limited staying power. *(Simon & Schuster Computer Software, One Gulf and Western Plaza, New York, NY 10023. C-64/$39.95 disk.)*

John Premack
Lexington, MA

Transylvania B

This Updated Version Of a Classic Adventure Won't Disappoint You

In this adventure, your quest is to plumb the forests of Transylvania, brave the evils of the night and find the kidnapped Princess Sabrina before dawn.

If you think you've been there before, think again: Transylvania has been rewritten and an award-winning graphics adventure has become even better.

Transylvania has a new, interactive parser routine called Comprehend, which has a vocabulary of more than 1000 words and can understand full-sentence and even multiple-sentence commands, as well as new locations (rooms) and new puzzles.

Included in the package are documents that set the scene and may or may not provide clues. There is a letter from King John, begging that you find his daughter (although his finest soldiers have failed) and directing you to call on the wizard Zin, whose calling card is included in the package.

Then there is the newspaper, the *Wallachian Herald*. I suggest you read every word of it carefully and keep it close at hand.

In the beginning, you'll find yourself in the middle of the Transylvanian forest. The scene is well-drawn, as is every scene in this graphics adventure. To move, you may specify directions by typing them in full or by abbreviating them (N,S,E,W).

Your commands and the game's replies are contained in a narrow space at the bottom of the screen. Pressing the return key at any time flips the picture off the screen, allowing you to review the last several moves. It would probably be possible to play this game as an all-text adventure and thus speed things up, but you'd miss a lot of the game's charm and the visual clues.

As with all adventures, you'll want to pick up all the detail you can; read every note and inscription; examine each new scene carefully. You never know where your next clue or breakthrough may come from.

There is also a werewolf involved in this adventure. (There are other things, too, moving through the night, but they are "offstage.") The werewolf is a clear and present danger through your first moves, and it seems the only way to escape being devoured when he appears in your path is to reverse your last move. Otherwise, the werewolf has you for a snack and you are offered a chance to restart the novel.

Once into the game, you may get the feeling it does not play fair: If, for example, you are in the meadow with the goblin and choose to go north to the red hut, you'd think a move south would take you back to the goblin. Not necessarily. You may end up elsewhere.

Although it is frustrating, remember that shifting landscapes are the stuff of dreams and fantasies, as are the unseen things that set you on fire or dump water on your head. You elected to go to a magic place, so don't blame the game if the magic is sometimes more than you can take.

Although Transylvania may not be the most sophisticated of today's graphics adventures, it is a good one. And, in large measure, the original version of Transylvania pointed the way for those that followed.

This package is definitely worth a second look by older adventurers and is a good entry-level game for novices. *(Penguin Software, 830 Fourth Ave., Geneva, IL 60134. C-64/$34.95 disk.)*

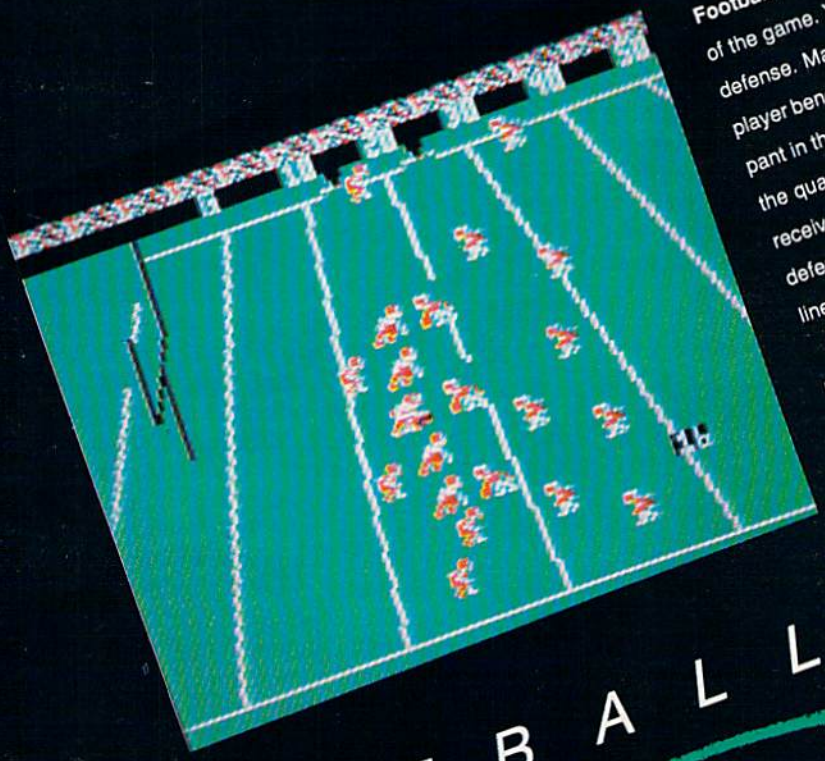
Ervin Bobo
St. Peters, MO

At Bat Stats 64 B

Organize Your Baseball And Softball Records With This Simple Program

At Bat Stats 64 enables C-64 owners to keep track of the records and offensive statistics of baseball and softball teams and players.

This program should prove particularly useful to managers and coaches



FOOTBALL

... With Spectacular Results!

Football puts you in control of every aspect of the game. You call the plays, offense and defense. Make substitutions from your 18-player bench. Then become an active participant in the play you've selected. You control the quarterback, then the running back or receiver once the ball is transferred. On defense, you become the in-action safety or linebacker for the play you've selected.

Discover how enjoyable a football simulation game can be. You will agree that **Football** is the first real football game on a computer. Available on disk for the Commodore 64/128 computers.

See Your Dealer ...

or write or call for more information. For direct order please enclose $39.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, Diners Club cards accepted.

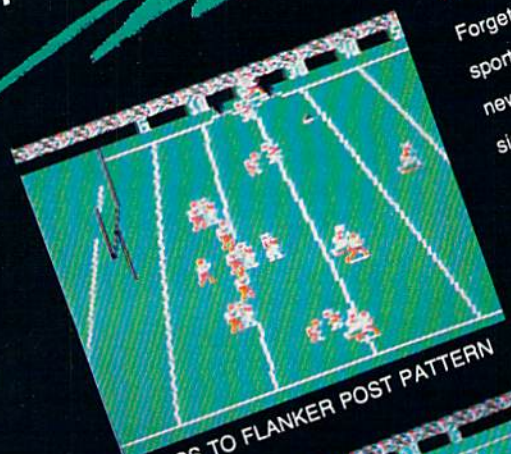
Commodore 64 and Commodore 128 are trademarks of Commodore Electronics, Ltd.

A True-to-Life Simulation ...

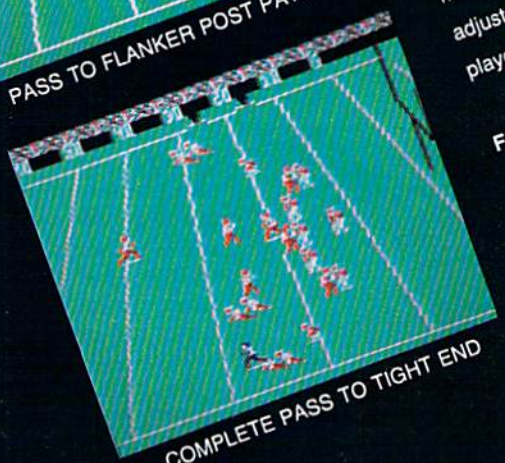
Forget everything you've seen or heard about sports simulation programs; **Football** sets new standards in realism and playability by simulating the real physics of the game.

Every offensive and defensive player has individual physical attributes (speed, power, and catching ability). Each quarterback's passing abilities are different. Players act and move individually on each play. And you can adjust the performance characteristics of any player, any way you like.

Football's overhead 3D perspective gives you a clear view of the entire field. The ball carrier is always highlighted for easy identification. And **Football's** real-time 30-second clock means fast-moving action from start to finish, with no game-slowing disk access.



PASS TO FLANKER POST PATTERN



COMPLETE PASS TO TIGHT END

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995
Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

Circle 26 on Reader Service card.

of amateur softball, Little League and scholastic baseball teams. Fanatical followers of major league baseball may also use it to keep a record of their favorite players.

At Bat Stats 64 lets you record and print results of up to 162 games; maintain and update a 40-player roster; record, update and print complete offensive statistics for every player on the roster; maintain and print team schedules; and print or review individual game summaries and details.

The program, written in Basic and assembly language, takes care of computing the results and statistics, and it is a very easy program to use. One reason is that each screen contains a Coach's Box, which tells you the options that are available to you and what the various function keys will do; it also provides special instructions or messages.

Virtually every function operates in a similar manner. Once you learn the operation of the first screen, all the others make sense. And the first screen is easy to learn, thanks to a very decent instruction manual and the program's menu-driven operation.

The program is divided into two parts. One is for maintaining and updating statistical information. The other is for reviewing and printing out various reports that you can generate from that information.

One complaint I have about At Bat Stats 64 is that you cannot freely move from one part of the program to the other. Although both parts interface with the same data disk, you can perform only one operation at a time and must reboot the program to go on to another operation.

Another quirk is that the program does not provide for maintaining pitching records. This would limit At Bat Stats 64's usefulness for many baseball managers.

At Bat Stats 64 will not accept entry of more than nine runs scored per game for any one player. It's not likely, but it *is* possible that an individual could score ten or more runs in a game. It's also possible for a player to go to bat ten or more times in a game, yet that data-entry field is also limited to single digits.

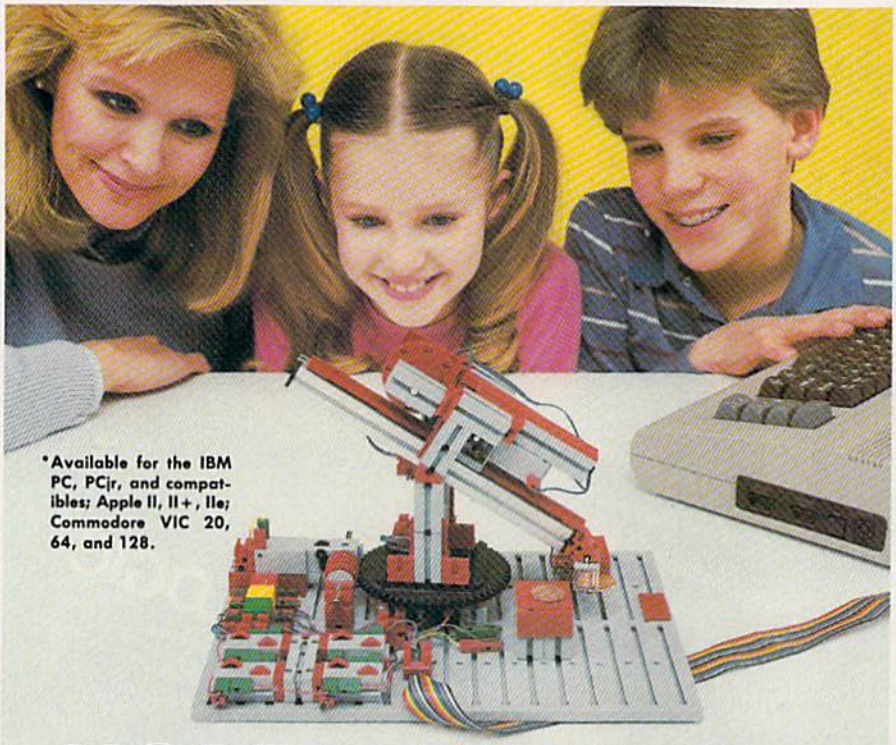
There are other quirks that make data-entry somewhat awkward. In order to enter player statistics or game results, you must first delete the zeros that are programmed into every field. And in order to make changes to just one field, you must move the cursor through every other field on the screen.

Most of these limitations are more annoyances than real problems, but the more serious flaws, such as the program's inability to track pitching performances, may be too important for some potential users to ignore.

On the positive side, the program's graphics, such as the charts and tables, are wonderful. Equally pleasing are the printouts that you can generate with this program. They come in tabular form and are very easy to read. They should work well with many printers, judging by the various options provided by the program.

Another nice feature is that, when you enter individual player statistics,

Circle 120 on Reader Service card.



*Available for the IBM PC, PCjr, and compatibles; Apple II, II+, IIe; Commodore VIC 20, 64, and 128.

MORE FUN PER BYTE

Turn your home computer into a source of fun for the entire family. The fischertechnik Robotic Computing Kit offers a new and exciting way to learn all about programming, robotics, and computer control.*

The kit teaches and entertains by letting you build and program many different, challenging projects. It's designed so every member of the family can have fun the first time they use it. The novice can start off by building a simple traffic-light project which teaches basic computer input/output operations. The family computer whiz can use advance programming skills to build and control more complex projects, like a teachable robot.

The kit comes complete with easy-to-understand instructions and wiring plans. Plus simple, clearly defined programs on a diskette that you can change and control with simple English commands. It all adds up to an entertainment package that the entire family will love!

Give your family more fun per byte with the fischertechnik Robotic Computing Kit. Write or call for the name of your nearest dealer. fischer America, Inc., 175 Route 46 West, Fairfield, NJ 07006 • (201) 227-9283.



fischertechnik COMPUTING

THE Premier Word Processing Package – CREATIVE COMPUTING

NEW!
• PAPERCLIP II for COMMODORE 128
• PAPERCLIP for APPLE II/E/C
• SPELLPACK for ATARI 130XE
Coming Soon
PAPERCLIP ELITE

"PaperClip is easy to use, yet offers the advanced features of programs designed for the IBM PC. These include: block move, copy, delete, macros, automatic page numbering, headers, footers, underlining, boldface, super and subscripts, variable character pitch, and custom character sets. The editing screen can be set up to 130 columns wide, & text can be scrolled in any direction. A preview mode displays formatted text exactly as it will appear on the printed page. You may further define your own formatting parameters, including margins, line lengths, page length and spacing.

PaperClip contains over 30 printer files for all the current major models. The documentation is excellent and the disk itself unprotected, though keyed through a joystick port. This means you can make as many back-up copies as you like, but can use the program only when the key is inserted."–CREATIVE COMPUTING

"PaperClip is one of the easiest of the professional word processors to use, with a sensible manual and plenty of aids for the accident-prone." COMPUTING NOW

"a "must have" in an ideal software-library" ELECTRONIC LEARNING

"PaperClip is the Cadillac of word processors"–OMNI

"an excellent full-featured word processor"–THE BOOK OF CO

"So clearly superior, ...State-of-the-art word processing"–ANTIC *"...mos*

"the ultimate word processor..." ANALOG

"...best professional word processor available" RUN

"exceptional word processing"–INPUT *"hard to beat"* ACE

"You'll find yourself growing spoiled."–FAMILY COMPUTING

"A superb word processor,...the most sophisticated to date!"

"...does exactly what it was intended to do...and more"

"...most powerful of packages"– COMMODORE MAGAZINE

"...facts attest to its excellence!"–FAMILY COMPUTING

NEW!
PAPERCLIP II for your C128!
Takes full advantage of the C128's increased speed and power!
• Faster program loading!
• Easier text handling!
• Advanced new features!
• Built in telecommunications! auto dial from menu supports 300 to 2400 baud and faster!
• Built in Spelling checker with more than 30,000 words! PLUS a personal dictionary for thousands more • Word wrap
• And much much more!

"You will not find a word processing package superior to this one!
– CREATIVE COMPUTING

PaperClip

*"The #1 Best Selling Word Processing Package"**

–BILLBOARD'S COMPUTER SOFTWARE CHARTS!

Available for Commodore 64, Pet, all Atari home computers, and new enhanced 128K versions for Apple II/e/c, Atari 130XE and Commodore 128. **COMING SOON:** Paperclip Elite for IBM MS DOS, Amiga and Atari ST.

BATTERIES INCLUDED

"The Energized Software Company!"

WRITE TO US FOR FULL COLOR CATALOG of our products for Commodore, Atari, Macintosh, Apple and IBM systems.

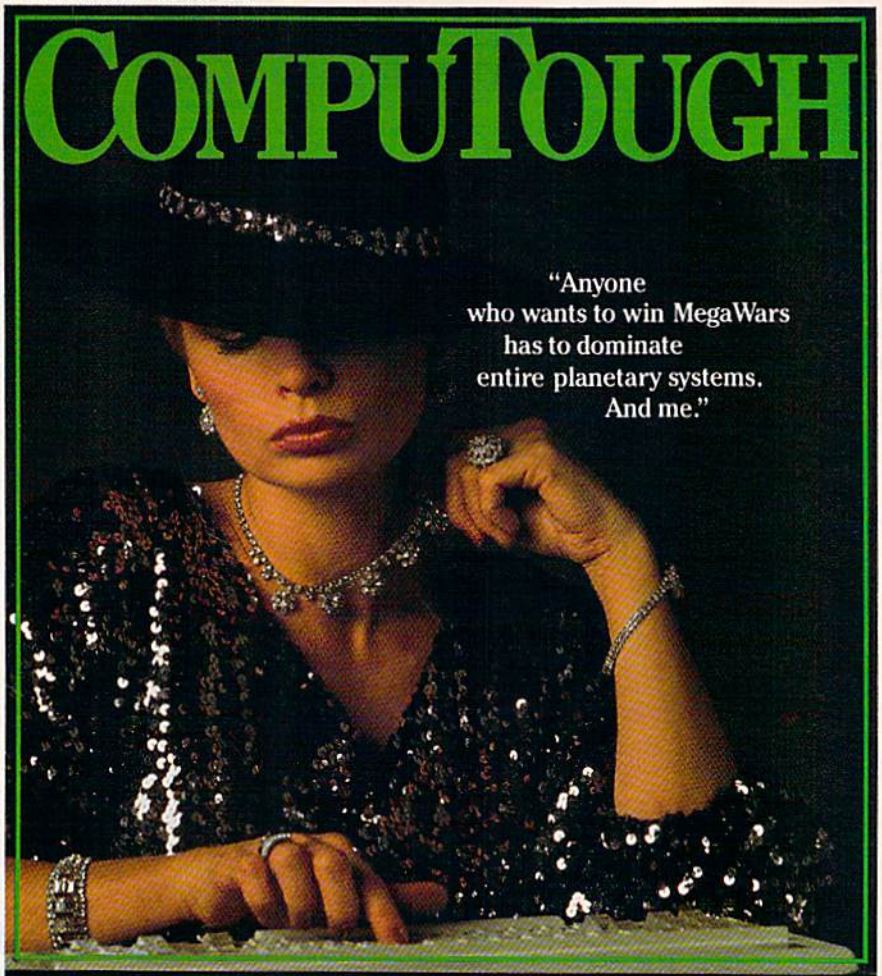
30 Mural Street
Richmond Hill, Ontario
L4B 1B5 Canada
(416) 881-9941
Telex: 06-986-266

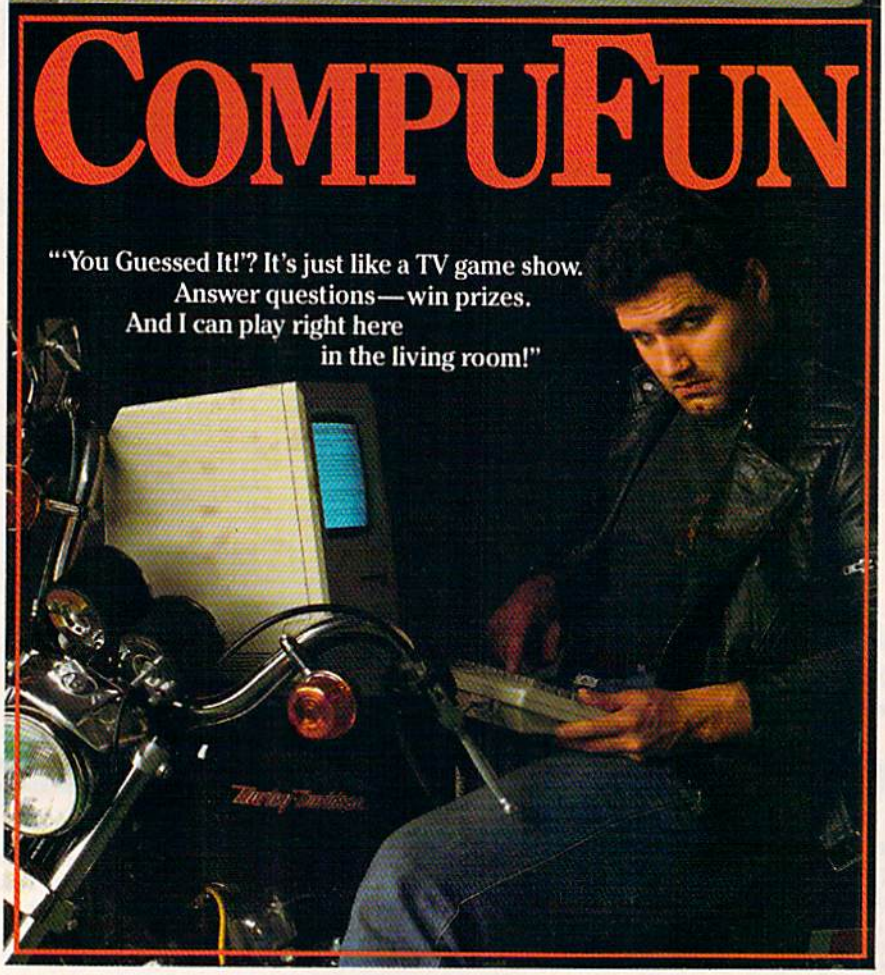
17875 Sky Park North,
Suite P, Irvine, California
USA 92714
(416) 881-9816
Telex: 509-139

FOR TECHNICAL SUPPORT OR PRODUCT INFORMATION PLEASE PHONE (416) 881-9816. © 1986 BATTERIES INCLUDED. MACINTOSH APPLE, ATARI, COMMODORE AND IBM ARE REGISTERED TRADEMARKS RESPECTIVELY OF APPLE COMPUTERS INC., ATARI INC., COMMODORE BUSINESS MACHINES INC., AND IBM BUSINESS MACHINES INC. *AS COMPILED FROM NATIONAL RETAIL STORE SALES REPORTS FOR WEEK ENDING JANUARY 5, 1985. IF YOU CAN'T FIND PAPERCLIP AT YOUR FAVOURITE SOFTWARE OUTLET YOU CAN ORDER DIRECT FROM US AT THE FULL SUGGESTED LIST PRICE (PLUS $5.00 FOR POSTAGE AND SHIPPING) BY CALLING 1-800-387-5707. ATARI & APPLE PAPERCLIP $59.95. PAPERCLIP II FOR THE C128 $79.95. ALL PRICES SHOWN ARE IN U.S. DOLLARS.

TO UPGRADE YOUR "PAPERCLIP FOR THE C128" TO PAPERCLIP II SEND US YOUR ORIGINAL DISK, KEY AND $35.00, AND WE'LL SEND YOU A COMPLETE NEW PACKAGE!

Circle 64 on Reader Service card.





the program prevents you from making certain mathematical mistakes. If, for example, the number of hits or runs awarded to individuals does not equal the total number awarded the team, the program will notify you of the imbalance.

But probably the nicest thing about At Bat Stats 64 is that it does what the folks at 43rd Street Software say it will do. And, providing you can live with its flaws, it will do it well for you. *(The 43rd Street Software Shop, 720 43rd St., Ashland, KY 41101. C-64/ $22.95 disk.)*

Scott Wasser
Wilkes-Barre, PA

Pipeline

B

Here's a Puzzling Plumbing Problem for Your Child to Solve

Pipeline is a clever program for children aged eight and up, but adults may enjoy it, too. Presented as part of the Thinking Strategy Series, from Learning Technologies, this game challenges you to solve problems.

The beauty of Pipeline lies in its apparent simplicity. Select one of three levels of play and watch the computer randomly sprinkle as many as seven objects across the screen. You must select and install various pieces of pipe to carry water from the main faucet to all of the objects.

You can rearrange the plumbing installation any number of times. But be forewarned: When you hit the return key to start the water flowing, mistakes will practically squirt you in the eye.

Finding the solution to this plumbing problem is not an easy task. To make things even more difficult, a master plumber can set the game's timer to turn on the water after a preselected time period and then see how much of the job he can complete before the valve is opened.

There is a certain amount of suspense in watching the blue water flow slowly through the system. Open pipes leak, while properly connected

devices squirt, gurgle and spurt. Objects that have not been properly hooked up are crossed off the screen with huge Xs.

The educational goals of this game are to provide practice in problem-solving techniques. It offers experience in analyzing problems, experimenting and using rules and models—and it's a lot of fun to play.

Despite being an engrossing educational exercise, Pipeline does have one annoying flaw. If you cannot find the solution to a particular problem, you're out of luck. Although Pipeline presents problems, assesses your work and demonstrates success and failure, the program neither shows how to correct mistakes nor offers a second chance.

Though it's designed for kids eight and older, Pipeline can also be enjoyed by little squirts—if they can get their parents to quit playing it. *(Learning Technologies, 4255 LBJ Freeway, Suite 131, Dallas, TX 75244. C-64/ $19.95 disk.)*

John Premack
Lexington, MA

Programmers' Basic Toolkit

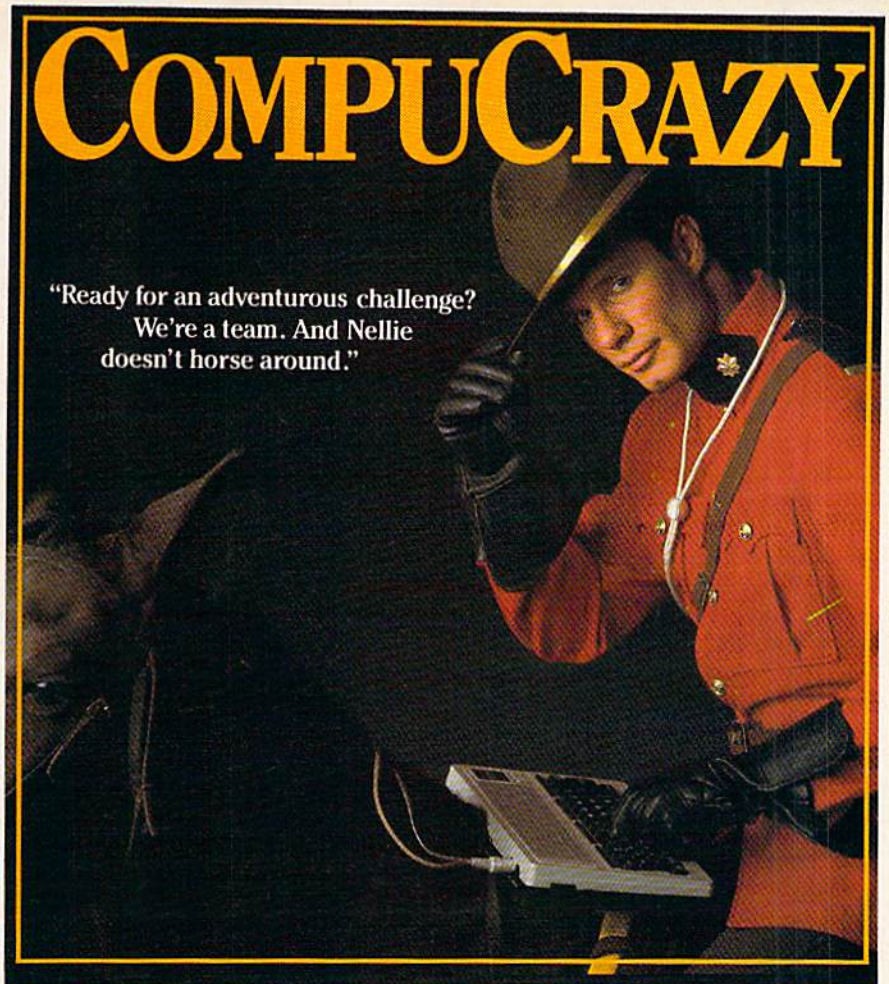
B

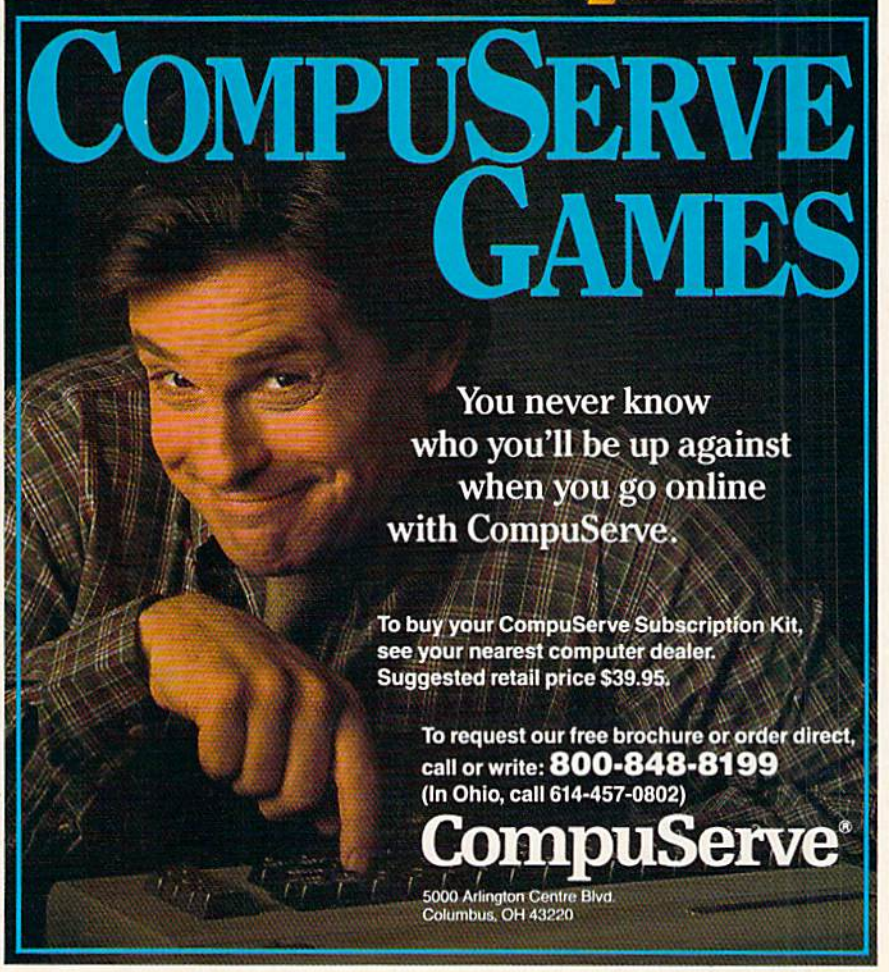
Boost Your C-64's Power With More Than 100 New Basic Commands

If you've ever tried to write your own programs using the Commodore 64's built-in Basic 2.0, you know how difficult it can be to access many of the machine's outstanding graphics and sound capabilities.

While Programmers' Basic Toolkit doesn't make programming a breeze for a complete novice, it does provide the advanced programmer with more than 100 new commands that allow you to control sound and graphics with assembly language power and speed. In addition, the package includes a pair of excellent utility programs—a background/font editor and a sprite editor. Both are joystick-controlled and feature convenient pull-down menus.

Circle 64 on Reader Service card.





Like the C-128's version of Basic, this program's Basic uses many descriptive keywords that help take the mystery out of programming. For example, to change a border color to red with your C-64, you'd normally type POKE 53280,2. With Programmers' Basic Toolkit, you can simply enter BORDER RED. Not only do

Some of the other commands that make this package a valuable programming aid include Change/To, which finds every occurrence of a specified string and replaces it with a new string of your choice; the Procedure and Do commands, which allow you to define a subroutine that you want executed repeatedly and then to call it up by name from anywhere in the program without having to use Gosub/Return; an On Error Goto command that makes a program jump to a specific line number whenever an error occurs; and REN, which lets you assign new numbers to your program lines. REN also allows you to specify the starting line number and the increment between line numbers, and it automatically adjusts all references to line numbers within your program.

This program's real strength, however, lies in the many specialized graphics commands that let you easily create, save, load and manipulate high-resolution, multicolor and text screens, as well as custom character sets and sprites to use with them.

Although all utilities and commands are well-documented in the user's guide, the quick-reference guide and the numerous help screens that accompany the program, it's assumed that you already know how to program in standard C-64 Basic. So,

If, however, you already have a good handle on Commodore Basic and feel you're ready for a little more power and flexibility, then Programmers' Basic Toolkit may be just what you need to unleash your programming potential. *(Epyx, 1043 Kiel Court, Sunnyvale, CA 94089. C-64/$34.95; C-128/$44.95 disk.)*

Bob Guerra
Charlestown, MA

Ultima IV: Quest of The Avatar



Explore the Magical World of Brittania in This Exciting Adventure

Whether you're a longtime fan of the Ultima series or a new-

Circle 126 on Reader Service card.

Have your C-128* look as smart as it works...



with the Command Center, a space saving cabinet specially designed for the C-128 Personal Computer System. Just install your keyboard and disk drives, set your CRT on top, and you've got Commodore value with the look of a much more expensive system.

It will untangle your wires and unclutter your desk. And look at all it includes:

- **Built-in AC Power Strip** with surge protection and line noise filtering.
- **Built-in Drive/CPU Cooling Fan.**
- **Phone/Modem telecommunications switch.**
- **Master A.C. Switch** with power indicator light.

Free 30-day trial offer and one year warranty. Order your Command Center today. Write: KETEK, P.O. Box 203, Oakdale, IA 52319.

VISA MasterCard **For faster service, call 1-800-626-4582 toll-free.**

*C-128 is a registered Trademark of Commodore Business Machines.

$149.95

KETEK, P.O. Box 203, Oakdale, IA 52319

YES! Rush me a Command Center to complete my C-128 system. I may enjoy it for up to 30 days and return it for a full refund. Enclosed is my check or money order for $153.45 ($149.95 plus $3.50 for shipping and handling).

Name _____

Address _____

City _____ State _____ Zip _____

DEALER INQUIRIES INVITED

comer to the fantasy role-playing genre, Ultima IV will amaze you with its vastness and variety of features.

Occupying both sides of two disks, Ultima IV is a mystical quest through the countryside, towns and underworld of Brittania in search of the Eight Virtues of the Avatar.

Throughout your journey, you'll encounter countless enemies who'll try to keep you from your goal. Fortunately, there are also several characters who may provide clues to assist you or even join your crusade if they share your philosophy. To reach your goal, you must learn to harness the magic powers of nature and the mysterious forces of the wind and the twin moons, Trammel and Felucca.

Ultima IV is quite different from many role-playing games. The program begins by taking you on a short graphics adventure that leads you to a renaissance fair and the wagon of a gypsy woman. The woman reads your future by asking you questions that measure your capacity for certain virtues. You are then given the profession of Fighter, Bard, Paladin, Mage, or one of four others, and assigned values for magical strength, dexterity and intelligence.

Although Ultima IV is basically a one-player game, you don't have to venture forth alone. By talking to some of the people you'll meet in the towns, you may be able to recruit some spirited and able-bodied traveling companions.

In addition to such common foes as bats, dragons, orcs, rats, trolls, spiders and slime, Ultima IV also attacks you with floating eyes called Gazers, Lava Lizards, deadly Mimics that can assume any shape, and squids, sea horses and pirates to plague you at sea.

Every animated opponent has its own method of wreaking havoc on your party and you quickly must learn the best way to oppose each enemy. From the weapons shops, you can obtain several kinds of armaments, including swords, daggers, maces and crossbows.

Some situations may call for casting spells to ward off enemies, remove evil spells or bring unfortunate fellow travelers back to life. Before you can cast a spell, you must acquire the necessary reagents, such as spider silk and blood moss, and mix them in the proper proportions. You'll be able to conjure up energy fields, ice balls and magic missiles to hurl at your foes, along with a number of spells that will help you maneuver around Brittania.

The land is a complex mixture of several kinds of terrain and waterways. You may travel by foot, horse or ship and, if the phases of the twin moons allow, teleport around Brittania through magic glowing portals.

Included in the package are a history of Brittania, a book of magic wisdom, a cloth map and an ahnk for good luck.

After exploring Brittania for a while, you'll probably conclude that Ultima IV may be the best game of this kind ever created. You may also realize you could use another good luck piece. *(Origin Systems, 340 Harvey Road, Manchester, NH 03103. C-64/$64 disk.)*

Bob Guerra
Charlestown, MA

Circle 214 on Reader Service card.

ACCIDENTS CAN HAPPEN!

SAFEGUARD YOUR SOFTWARE BY MAKING A BACKUP WITH



THE PROFESSIONAL WAY TO BACKUP YOUR C128/C64 SOFTWARE!

ONLY $49.95 ORDER BY PHONE 805-687-1541 ext. 84

Also available: DiskMaker ToolKit™ SUPER Disk Utility package. SPECIAL combo offer with DiskMaker™! Ask about DISCOUNT VALUE PACK and MODULE SUBSCRIPTION SPECIAL!

Credit card/COD order by phone 24hrs/7 days or send check/money order payable to BASIX. CA residents add 6% tax. Add $3.50 shipping/handling for US. CANADA add $10.00. Dealer inquiries invited.

DON'T LET AN ACCIDENT RUIN YOUR ONLY COPY...BACK IT UP WITH DISKMAKER™ !!

basix

3463 State Street · Suite 1541A · Santa Barbara · CA 93105



firebird

2 GAMES IN ONE PACK



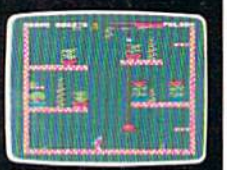


GERRY THE GERM

Gerry sets out to prove his worth as a vibrant virus.

CARTOON ADVENTURE





MICROCOSM

With your help, maintenance may be able to keep the plants alive until help arrives . . .

ACTION ARCADE

GOLD RANGE GOLD RANGE GOLD



A FANTASTIC VOYAGE OF DISCOVERY AND ADVENTURE

ELITE



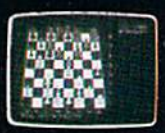




CLOSES THE DOOR ON ALL THE OTHERS

COLOSSUS CHESS IV







WELCOME TO TH

FRANKIE
HOLL



2 GAMES IN ONE PACK 2 GAMES IN ONE PACK 2 GAMES IN ONE PACK





WILLOW PATTERN

Force your way into the Mandarin's Palace against terrible odds — against beautiful oriental backdrops.

ADVENTURE ARCADE STYLE





UNDERWURLDE

All you need is there to take. Locate the weapons, then make a journey on if you dare . . .

3D GRAPHIC ADVENTURE





BOOTY

'Shiver me timbers', splice the mainbrace and pass the grog me hearties — here be the greatest pirate adventure of them all.

ACTION ARCADE





CHIMERA

Investigations have traced the source of piratical radio signals to a giant alien vessel orbiting the earth — eliminate the threat!

3D GRAPHIC ADVENTURE





SABRE WULF

'Twas split by Quad and hidden still — an amulet to seek thy will —
The pieces lost must thee amass.

3D GRAPHIC ADVENTURE





CYLU

Greetings warrior king to the land of Evol. Our people need a new leader to make us great again.

3D GRAPHIC ADVENTURE

COMMODORE 64/128K

FACTSHEET/ORDER HOTLINE: 201.934.7373

COMMODORE 64/128 ARE TRADE MAR

GOLD RANGE, SILVERDISK (2 GAMES IN ONE PACK)

Circle 104 on Reader Service card.

FOR THE CBM 64/128™

British Chartbusters at your local store now...

RANGE GOLD RANGE GOLD RANGE



PLEASURE GAME

GOES TO WOOD





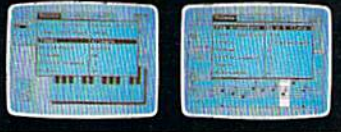


PLUG IN... KEY IN... AND ROCK YOUR MICRO!

THE MUSIC SYSTEM



THE ADVANCED MUSIC SYSTEM



2 GAMES IN ONE PACK



ACTION ADVENTURE



ARC OF YESOD

Now as his craft touches down safely but not undetected on the outskirts of the Capital City of Ariat where the Monolith is being stored, you must become Charlie – his mission is now yours.



ACTION ADVENTURE



NODES OF YESOD

Somewhere on the surface of the moon... The shuttle lands, the adventure begins.

2 GAMES IN ONE PACK 2 GAMES IN ONE PACK 2 GAMES IN ONE PACK



GRAPHIC ADVENTURE



RUNESTONE

The epic quest of Greymarel, Morval and Eliador.



3D ACTION ADVENTURE

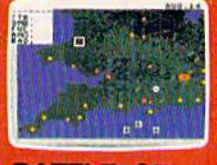


CHICKEN CHASE

Defend the chicken house against insatiable enemies



STRATEGY WARGAMES



BATTLE OF BRITAIN

In the famous words of Winston Churchill:
"Never has so much been owed by so many to so few"



TEXT ADVENTURE



THE HELM

Have you the cunning, power and knowledge to wrest the troubled helm from the dark ones evil grasp?



3D ACTION ADVENTURE

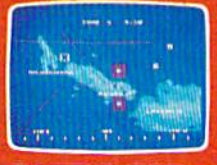


RASPUTIN

You must destroy the Jewel of the Seven Planets which is the power source of the spirit of Rasputin



STRATEGY WARGAMES



BATTLE FOR MIDWAY

'Battle For Midway' puts you in command of the US Pacific fleets six months after the attack by the Japanese on Pearl Harbour.

FIREBIRD LICENSEES INC. P.O. BOX 49, RAMSEY, N.J. 07446

KS OF COMMODORE BUSINESS MACHINES

COMMODORE 64/128K

GEOS: "A WHOLE NEW WORLD FOR YOUR COMMODORE"

Remember when the C-64 was considered a computer with limited capabilities? Well, GEOS, the new operating system from Berkeley Softworks, has changed that impression by tapping the hidden potential of the C-64, unleashing a powerful computer with features that rival those of much higher-priced micros.

By MATTHEW STERN

GEOS stands for Graphic Environment Operating System, a new bit-mapped operating system from Berkeley Softworks that opens up a new world for Commodore 64 and 128 owners. It brings new possibilities to the Commodore realm by giving the computer an easy-to-use operating system of icons, pull-down menus, windows and dialogue boxes, just like the Apple Macintosh, Commodore Amiga and Atari 520ST.

GEOS not only lets you easily combine text and graphics in your word processing documents, but also speeds up your disk drive five to seven times and uses it to increase the C-64's available memory.

All these enhancements are achieved by software. GEOS comes on a single disk that contains the operating system, deskTop, desk accessories and two applications: geoPaint, a graphics designer and editor, and geoWrite, a word processor. Its operation requires a joystick or a mouse, such as Commodore's 1350.

We reviewed GEOS using the 1350 mouse, which has two buttons. (GEOS, however, employs only the left button.) Although the mouse puts the C-64 on a par with some more expensive computers, the joystick is actually more responsive. Even at the mouse's greatest acceleration, the initial movement tends to be slow. (However, Commodore has plans to release a lower-cost, one-button mouse that promises a speed increase.)

What GEOS Does

The first thing that appears after you load the GEOS operating system is the deskTop user interface, which you use to handle files. As on the Macintosh, Amiga and 520ST, disks and files are represented as icons. All the



files are displayed right in front of you on a disk notepad, with different types of files represented by different icons. You can perform all functions either by activating an icon or by selecting a menu item.

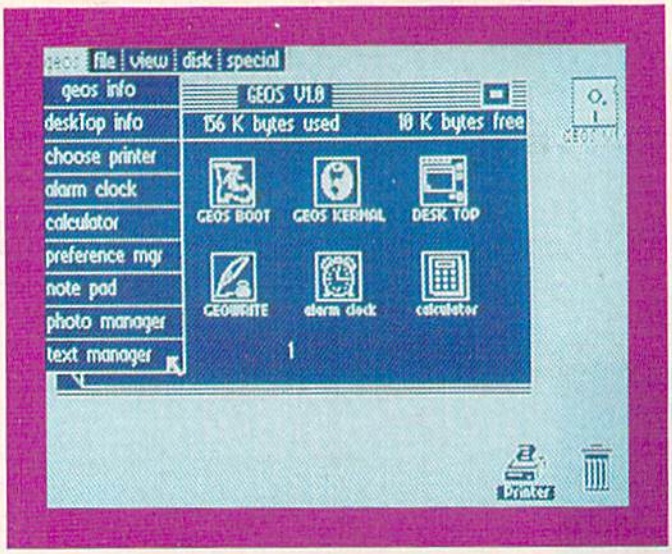
Instead of typing in a long command, as C-64 users currently do, you just move the pointer (with mouse or joystick) to the desired menu on the command bar across the top of the screen and press the button once (called clicking). This brings down a menu of related commands, from which you select the one you want.

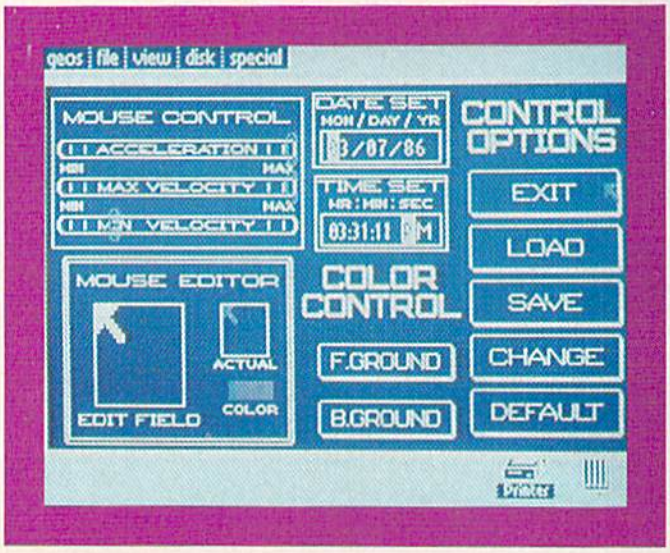
You can also use icons to perform operations. For example, to delete a file, drag its icon over to the trash can; to run an application, move the pointer to the icon and press the mouse button twice (called double-clicking). Those of you who are new to this type of user interface should get a special kick out of this aspect of the system.

DeskTop not only makes using the GEOS operating system easier and more fun; it adds several features usually found only on more powerful computers. For example, if you wonder when you made the last revision on a file or what type of application it belongs to, click on its icon and select the Get Info from the File menu. You'll get all information about the file, including its type and the date and time you last revised it.

Additional features let you enter a two- or three-line description and write-protect the file by clicking on a box. Commands in the View menu can display information for all the files on the disk's notepad, according to name, date of last revision, size and type.

GEOS also achieves something never done before by using the 1541 or 1571 disk drive as a virtual memory device. This means that when GEOS runs out of room in





the computer, it saves the extra data to the disk drive. GEOS, desk accessories and applications can thus all run at the same time and still allow more than enough room for your documents. Moreover, since GEOS speeds up the drive five to seven times the normal speed, there is hardly any waiting. Unlike the fast-loader programs, which speed up only the loading process, any GEOS application will continue to operate at the higher speed.

GEOS Works Together

GEOS, its disk accessories and the applications geoPaint and geoWrite are all designed to work together. The operating system resides in memory at all times and does not conflict with the program you are using.

Version 1.0 of GEOS comes with a preference manager, alarm clock, note pad, calculator and photo and text albums. The preference manager lets you change the time, date, mouse speed and even the pointer's design and color. You can also change GEOS's foreground and background colors to whatever combination you please.

The alarm clock and calculator are self-explanatory. The notepad, however, is probably a new feature for many C-64 users. Actually a place for storing short memos that you can recall at any time, it holds up to 127 pages, with 250 characters per page.

The photo and text albums are handy features that allow you to cut excerpts from geoWrite files and sections from geoPaint pictures, store them on disk and later paste them into new geoWrite files. This is essentially an electronic scrapbook—a feature that will be appreciated by newsletter editors and designers (much like the Clipboard features of the Mac that let you use data, text and graphics from one application with another).

Data and desk accessories are not the only things that GEOS applications can share; they also use the same text fonts, printer drivers and disk enhancements.

Running non-GEOS Programs and Using Two Drives

GEOS is flexible in that you can run non-GEOS programs if you wish. Basic programs and many machine language programs can be booted from within the deskTop program. You just open your non-GEOS disk from the disk menu and double-click the icon of the program you want to use. Most non-GEOS programs will autoload and autorun. Berkeley did a good job on this.

You will find there are some machine language and copy-protected programs that will not autoload and run within GEOS. Also, once you've booted out of GEOS, you cannot, of course, use the system's fast loader or enhanced DOS.

When you want to get back into GEOS, you just break the program, insert the GEOS disk and press the restore key. GEOS will automatically reboot.

The system lends itself well to a two-drive setup. When running a non-GEOS program, you can just place its disk into your second drive and keep GEOS in the first. This removes the chore of disk-swapping and makes file-handling much easier.

Two drives are also a distinct advantage when you're using backup disks. You're encouraged to make copies of your GEOS disk and then tailor them to your favorite applications by deleting non-essential files, thus making room for your application files. A two-drive setup easily lets you use your boot disk and an application backup disk without swapping.

GeoPaint

GeoPaint looks and works a lot like the Apple Macintosh's MacPaint, except that it offers the entire line of the 16 Commodore colors. It gives you a selection of 14 different drawing tools, which appear as icons on the left of the screen. Down one side of the screen is a large drawing window, showing a section of the 8½- by 11-inch page you can use for your illustration.

To move around the page, you use the scrolling-arrows icon, which appears as four arrows in the upper-left corner of the drawing menu. At the top of the screen is the command bar, with functions for program options and text fonts, as well as for saving and closing files. GeoPaint lets you use the full library of fonts with your graphics.

For free-hand drawing, just click on the pencil-head icon and sketch on the drawing window. The pointer turns into a little pencil as you move it to the window, and it also changes color to indicate different uses (which the Macintosh cannot do!). It turns yellow when you're just moving it, black when you're drawing and red when you're erasing.

Using the mouse, a more natural drawing tool than a joystick or trackball, it's easy to create professional-quality graphics with geoPaint. Since all the functions are on the

Circle 223 on Reader Service card.

COMMODORE

MONITORS

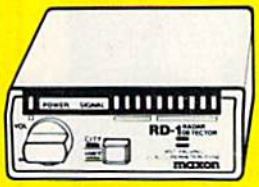


COLOR COMPOSITE 1702

$139.00 (RGB's Available)

RADAR DETECTOR

High Performance



THE EASY BEEP

NOW $88.00

RETAIL $249.00

FREE TRIAL PERIOD

PRINTER

EPSON WARRANTED



NOW $78.00

RETAIL $200.00

FREE TRIAL PERIOD

TUNERS

Turn your Monitor into a Color

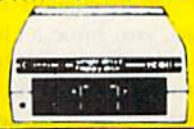




$78

DISK DRIVES

1541 COMMODORE



$149.00

MODEMS POWER SUPPLY





On Sale!

CABLE TV

CONVERTERS

JERROLD OAK



"WHY RENT WHEN NOW YOU CAN OWN"

PRO-TECH-TRONICS

6870 Shingle Creek Parkway #103 • Minneapolis, MN 55430 • (612) 560-6603

MasterCard VISA

—NEXT-DAY DELIVERY—*

CALL TODAY

*IN STOCK ITEM

SCHOOL P.O.'s Accepted!

1-800-345-5080

It Talks! It Recognizes! It Writes Music! and more . . .



THE AMAZING VOICE MASTER®

Speech and Music Processor

Your computer can talk in your own voice. Not a synthesizer but a true digitizer that **records** your natural voice quality—and in any language or accent. Words and phrases can be expanded without limit from disk.

And it will understand what you say. A real word recognizer for groups of 32 words or phrases with unlimited expansion from disk memory. **Now you can have a two way conversation with your computer!**

Easy for the beginning programmer with new BASIC commands. Machine language programs and memory locations for the more experienced software author.

Exciting Music Bonus lets you hum or whistle to write and perform. Notes literally scroll by **as you hum!** Your composition can be edited, saved, and printed out. You don't have to know one note from another in order to write and compose!

Based upon new technologies invented by **COVOX.** One low price buys you the **complete system**—even a voice controlled black-jack game! In addition, you will receive a subscription to COVOX NEWS, a periodic newsletter about speech technology, applications, new products, up-dates, and user contributions. **You will never find a better value for your computer.**

ONLY $89.95 includes all hardware and software.

Available from your dealer or by mail. When ordering by mail add $4.00 shipping and handling ($10.00 foreign, $6.00 Canada).

The Voice Master is available for the Commodore 64, 128, Apple IIc, IIe, II+, and Atari 800, 800XL, 130XE. Specify model when ordering. (Apple II+ owners must have joystick adapter. Available from Covox at only $9.95.)

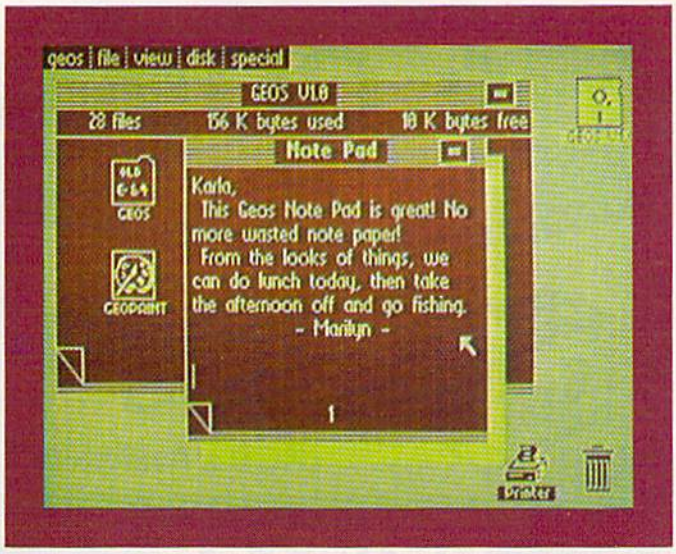
Apple IIe and II+ owners: Enhance speech quality and music capabilities with optional Sound Master hardware card. Installs in slot 4 or 5. Available separately for $39.95 with demo software, or order with Voice Master for only $119.95 (saves $10 when ordered separately).

For telephone demo, additional information, or prompt service for credit card orders,

VISA CALL (503) 342-1271 MasterCard

Call or write today for FREE audio demo cassette tape and brochure.

COVOX INC. (503) 342-1271
675-D Conger Street, Eugene, OR 97402
Telex 706017 (AV ALARM UD)



screen, you don't need to flip back and forth from the drawing screen to the menu to select a function.

Editing is also very easy. You draw a box around the graphic you want to copy or move and click where you want it placed; or you can cut or copy it into the photo album for later pasting into another geoPaint picture or geoWrite document. Graphics can also be rotated, inverted (shown in reverse video) or flipped over.

A handy pixel-edit mode lets you put in fine detail by enlarging a portion of your picture so you can see each pixel. If you make a mistake, just click the Undo icon to erase your last change, or select the Recover from Disk command in the Options menu to bring up the last-saved version of your file.

The geoPaint 1.0 version that we reviewed did not support full-color graphics. Instead, you have a choice of 32 shading patterns. Berkeley Softworks said it chose black-and-white (over full color) for its readability, especially on television sets, and so that you can see your artwork the way it will actually be printed on your black-and-white printer.

The final release *does* use color and supports color printers, such as the Epson JX80, Okimate 10, the Apple ImageWriter II and laser printers such as the Hewlett-Packard.

GeoWrite

If you are used to word processors with complicated editing commands, geoWrite will give you a pleasant surprise. Its commands are so easy to use that you'll be able to master it in minutes. To delete a range of text, just highlight it by dragging the mouse over it, holding down the button as you do so, and then press the INST/DEL key. If you want to change text, highlight it and type in the correction. The new words will replace the old.

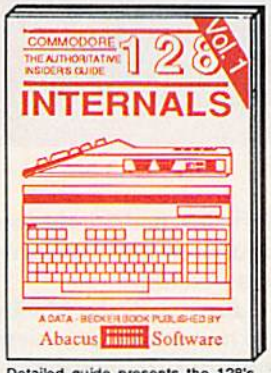
Change a margin? Just go to the ruler at the top of the window, click on the M and move it where you want it to go. The document will reformat automatically. Since GEOS uses a 40-column screen, you'll see only two-thirds of your document's width at a time. The document scrolls across the screen as you type, and you can drag the pointer to any section you want to see.

With the variety of type styles and sizes available in GEOS, you can select a combination to achieve and print out a screen display ranging from 30 to 110 characters.

Circle 8 on Reader Service card.

C-128™ and C-64™ UNMASKED

BEST SELLERS



Detailed guide presents the 128's operating system, explains graphic chips, Memory Management Unit, 80 column graphics and commented ROM listings. **500pp $19.95**



Get all the inside information on BASIC 7.0. This exhaustive handbook is complete with commented BASIC 7.0 ROM listings. Coming Summer '86. **$19.95**



Filled with info for everyone. Covers 80 column hi-res graphics, windowing, memory layout, Kernal routines, sprites, software protection, autostarting. **300pp $19.95**



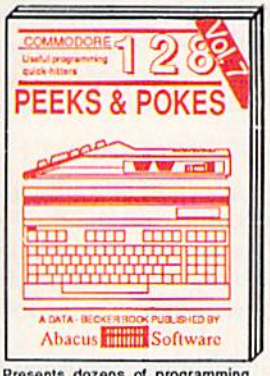
Insiders' guide for novice & advanced users. Covers sequential & relative files, & direct access commands. Describes DOS routines. Commented listings. **$19.95**



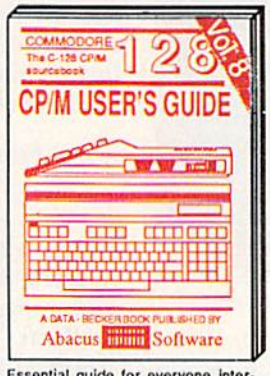
Learn fundamentals of CAD while developing your own system. Design objects on your screen to dump to a printer. Includes listings for '64 with Simon's Basic. **300pp $19.95**



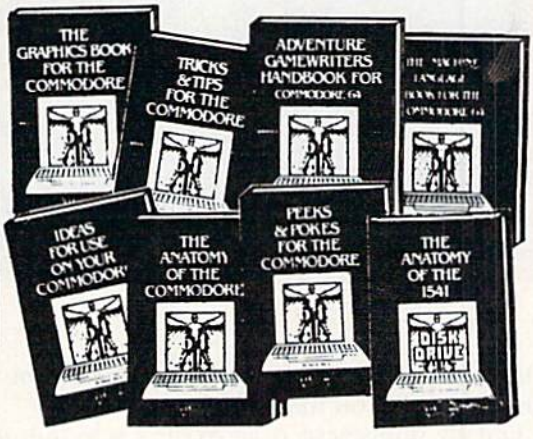
Introduction to programing; problem analysis; thorough description of all BASIC commands with hundreds of examples; monitor commands; utilities; much more. **$16.95**



Presents dozens of programming quick-hitters. Easy and useful techniques on the operating system, stacks, zero-page, pointers, the BASIC interpreter and more. **$16.95**



Essential guide for everyone interested in CP/M on the 128. Simple explanation of the operating system, memory usage, CP/M utility programs, submit files & more. **$19.95**



ANATOMY OF C-64 Insider's guide to the '64 internals. Graphics, sound, I/O, kernal, memory maps, more. Complete commented ROM listings. **300pp $19.95**

ANATOMY OF 1541 & DRIVE Best handbook on floppy. Explains all. Many examples and utilities. Fully commented 1541 ROM listings. **500pp $19.95**

MACHINE LANGUAGE C-64 Learn 6510 code write fast programs. Many samples and listings for complete assembler, monitor, & simulator. **200pp $14.95**

GRAPHICS BOOK C-64 - best reference covers basic and advanced graphics. Sprites, animation, Hires, Multicolor, lightpen, 3D-graphics, IRQ, CAD, projections, curves, more. **350pp $19.95**

TRICKS & TIPS FOR C-64 Collection of easy-to-use techniques: advanced graphics, improved data input, enhanced BASIC, CP/M, more. **275pp $19.95**

1541 REPAIR & MAINTENANCE Handbook describes the disk drive hardware. Includes schematics and techniques to keep 1541 running. **200pp $19.95**

ADVANCED MACHINE LANGUAGE Not covered elsewhere: - video controller, interrupts, timers, clocks, I/O, real time, extended BASIC, more. **210pp $14.95**

PRINTER BOOK C-64/VIC-20 Understand Commodore, Epson-compatible printers and 1520 plotter. Packed: utilities; graphics dump; 3D-plot; commented MPS801 ROM listings, more. **330pp $19.95**

SCIENCE/ENGINEERING ON C-64 In depth intro to computers in science. Topics: chemistry, physics, biology, astronomy, electronics, others. **350pp $19.95**

CASSETTE BOOK C-64/VIC-20 Comprehensive guide; many sample programs. High speed operating system fast file loading and saving. **225pp $14.95**

IDEAS FOR USE ON C-64 Themes: auto expenses, calculator, recipe file, stock lists, diet planner, window advertising, others. Includes listings. **200pp $12.95**

COMPILER BOOK C-64/C-128 All you need to know about compilers: how they work; designing and writing your own; generating machine code. With working example compiler. **300pp $19.95**

Adventure Gamewriter's Handbook Step-by-step guide to designing and writing your own adventure games. With automated adventure game generator. **200pp $14.95**

PEEKS & POKES FOR THE C-64 Includes in-depth explanations of PEEK, POKE, USR, and other BASIC commands. Learn the "inside" tricks to get the most out of your '64. **200pp $14.95**

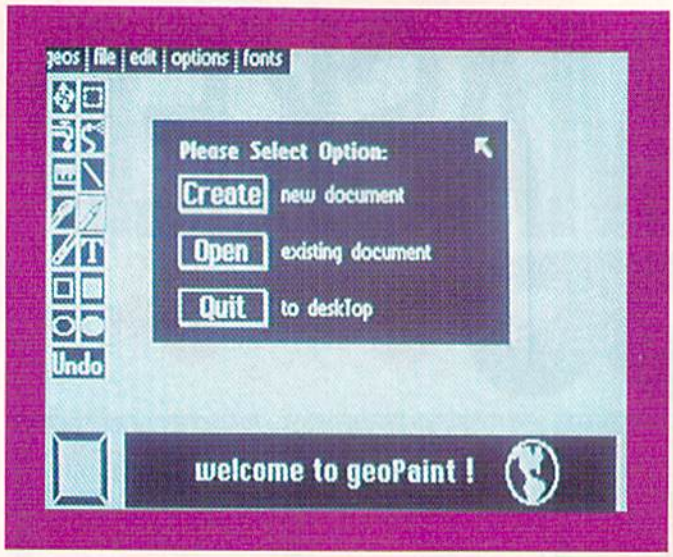
Optional Diskettes for books For your convenience, the programs contained in each of our books are available on diskette to save you time entering them from your keyboard. Specify name of book when ordering. **$14.95 each**

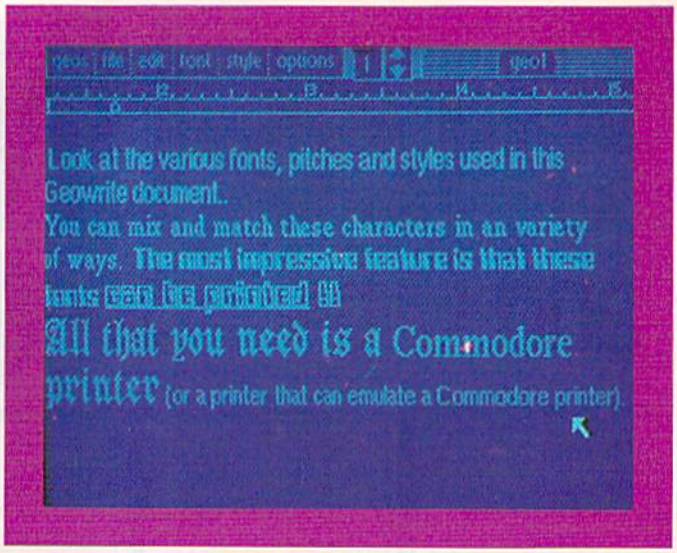
C-128 and C-64 are trademarks of Commodore Business Machines Inc.

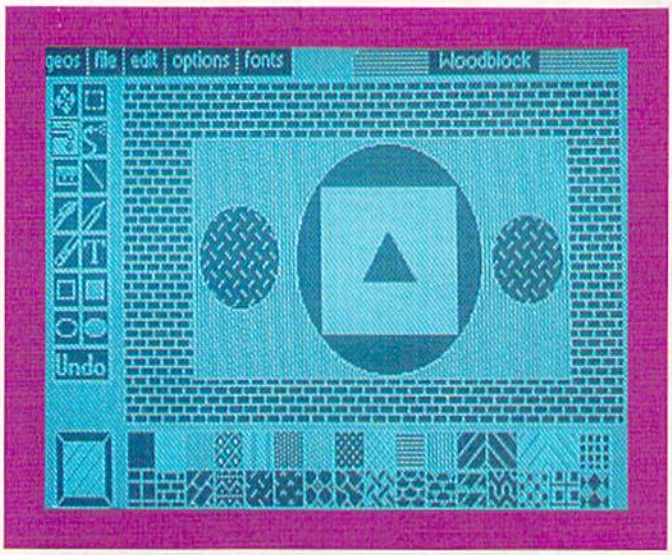
Abacus Software

P.O. Box 7219 Dept. R6 Grand Rapids, MI 49510 - Telex 709-101 - Phone (616) 241-5510

Optional diskettes available for all book titles - $14.95 each. Other books & software also available. Call for the name of your nearest dealer. Or order directly from ABACUS using your MC, Visa or Amex card. Add $4.00 per order for shipping. Foreign orders add $10.00 per book. Call now or write for your **free** catalog. Dealer inquires welcome--over 1400 dealers nationwide.







The multiple fonts, pitches and styles can be displayed simultaneously on the screen.

Equally impressive is geoWrite's selection of proportionally spaced fonts and typestyles. GEOS currently comes with six fonts in several different sizes, all displayable in regular, bold, italics, underline and outline typestyles. Think of the attractive newsletters and reports you can create with them, especially if you add geoPaint pictures!

GeoWrite takes advantage of GEOS's virtual memory, so your only limitation in document length is available disk space. With version 1.0, the GEOS system files, the fonts and the geoWrite application have to be on the same disk as your file. But this still gives you about 35–40K of free disk space for your documents—more than most C-64 word processors and enough for about 11 to 13 single-spaced, text-only pages. GeoWrite documents take more memory, of course, when you add graphics.

In spite of geoWrite's easy-to-use editing features, its spectacular fonts and the ability to create longer-than-average documents, it has some shortcomings that may disappoint you. Due to memory limitations, version 1.0 lacks the headers and footers, double and triple spacing, page numbering and search-and-replace functions you find in most word processors. Berkeley had to choose, and it decided that these were features of lower priority than others included in the current version.

GeoWrite also shares one bad feature with the Macintosh: You can't use the cursor keys to move your document around. Instead, you have to use the mouse to manipulate a small box icon or click on two arrows at the top of the screen.

Another complaint I have about geoWrite, which also applies to GEOS as a whole, is the lack of keyboard equivalents for popular commands. After using GEOS for a while, I got tired of reaching for the mouse every time I wanted to initiate a command.

The Future of GEOS

This version of GEOS is nonetheless impressive. Berkeley Softworks will send to all of its registered version 1.0 owners a free version of the final release, which should be available by the time you read this, as well as a package containing additional fonts for use in geoWrite and geoPaint.

Some of the changes planned for the final version are color graphics, as mentioned earlier, and changeable shading patterns for geoPaint, a trash can that will let you recover files thrown out by mistake, and cursor-key controls and a search-and-replace function for geoWrite. A C-128-mode version of GEOS is expected in the fall. If and when future enhanced versions are released, Berkeley Softworks will make them available to GEOS owners at a nominal charge.

Additional GEOS applications and desk accessories are under development by Berkeley Softworks and other manufacturers. If you're interested in developing programs that use GEOS, Berkeley Softworks will be releasing a programmer's reference guide in June or July. GEOS is available for $59.95 from Berkeley Softworks, 2150 Shattuck Ave., Berkeley, CA 94704; 415-644-0883 or 800-443-0100.

GEOS is not just another software program. It's a wholly new operating system that gives Commodore 64 and 128 users some important capabilities never before available. Moreover, it's fascinating and fun to use. R

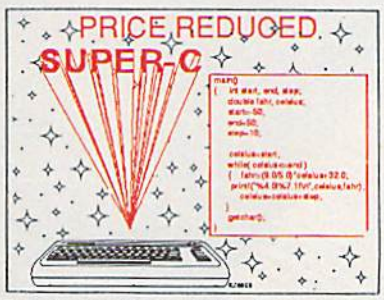
Address all author correspondence to Matthew Stern, 6434 Amigo Ave., Reseda, CA 91335.

Circle 8 on Reader Service card.

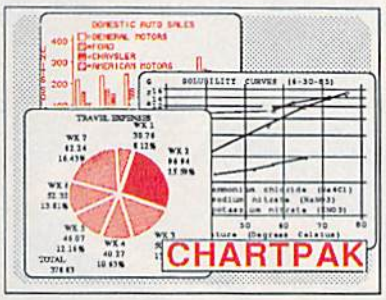
'128™ and C-64™ SENSATIONAL SOFTWARE



The *complete* compiler and development package. Speed up your programs 5x to 35x. Many options: flexible memory management; choice of compiling to machine code, compact p-code or both. '128 version: 40 or 80 column monitor output and FAST-mode operation. '128 Compiler's extensive 80-page programmer's guide covers compiler directives and options, two levels of optimization, memory usage, I/O handling, 80 column hi-res graphics, faster, higher precision math functions, speed and space saving tips, more. A great package that no software library should be without. **128 Compiler $59.95**
64 Compiler $39.95



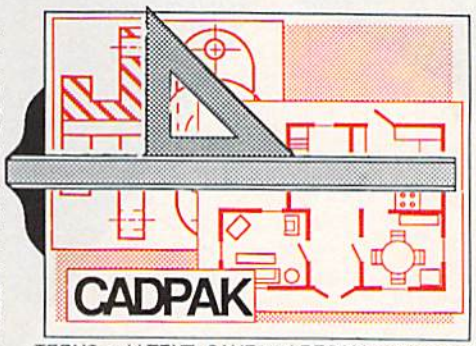
For school or software development. Learn C on your Commodore with our in-depth tutorial. Compile C programs into *fast* machine language. C-128 version has added features: Unix™-like operating system; 60K RAM disk for fast editing and compiling Linker combines up to 10 modules; Combine M/L and C using CALL; 51K available for object code; Fast loading (8 sec. 1571, 18 sec. 1541); Two standard I/O librarys plus two additional libraries—math functions (sin, cos, sqrt, etc.) & 20+ graphic commands (line, fill, dot, etc.).
C-128 $79.95
C-64 $59.95



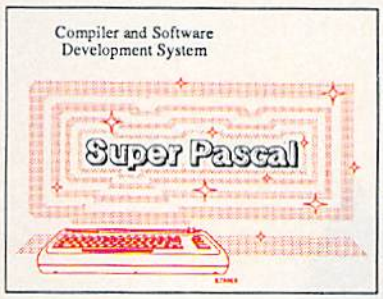
Easily create professional high quality charts and graphs without programming. You can immediately change the scaling, labeling, axis, bar filling, etc. to suit your needs. Accepts data from CalcResult and MultiPlan. C-128 version has 3X the resolution of the '64 version. Outputs to most printers.
C-128 $39.95
C-64 $39.95

PowerPlan
One of the most powerful spreadsheets with integrated graphics. Includes menu or keyword selections, online help screens, field protection, windowing, trig functions and more. PowerGraph, the graphics package, is included to create integrated graphs and charts. **C-64 $39.95**

Technical Analysis System for the C-64	$59.95
Ada Compiler for the C-64	$39.95
VideoBasic Language for the C-64	$39.95



Remarkably easy-to-use interactive drawing package for accurate graphic designs. New dimensioning features to create exact scaled output to all major dot-matrix printers. Enhanced version allows you to input via keyboard or high quality lightpen. Two graphic screens for COPYing from one to the other. DRAW, LINE, BOX, CIRCLE, ARC, ELLIPSE available. FILL objects with preselected PATTERNS; add TEXT; SAVE and RECALL designs to/from disk. Define your own library of symbols/objects with the easy-to-use OBJECT MANAGEMENT SYSTEM–store up to 104 separate objects.
C-128 $59.95
C-64 $39.95



Not just a compiler, but a complete system for developing applications in Pascal with graphics and sound features. Extensive editor with search, replace, auto, renumber, etc. Standard J & W compiler that generates fast machine code. If you want to learn Pascal or to develop software using the best tools available–**SUPER Pascal** is your first choice.
C-128 $59.95
C-64 $59.95

OTHER TITLES AVAILABLE:

COBOL Compiler
Now you can learn COBOL, the most widely used commercial programing language, and learn COBOL on your 64. COBOL is easy to learn because its easy to read. COBOL Compiler package comes complete with Editor, Compiler, Interpreter and Symbolic Debugger. **C-64 $39.95**

Personal Portfolio Manager
Complete portfolio management system for the individual or professional investor. Easily manage your portfolios, obtain up-to-the-minute quotes and news, and perform selected analysis. Enter quotes manually or automatically through Warner Computer Systems. **C-64 $39.95**

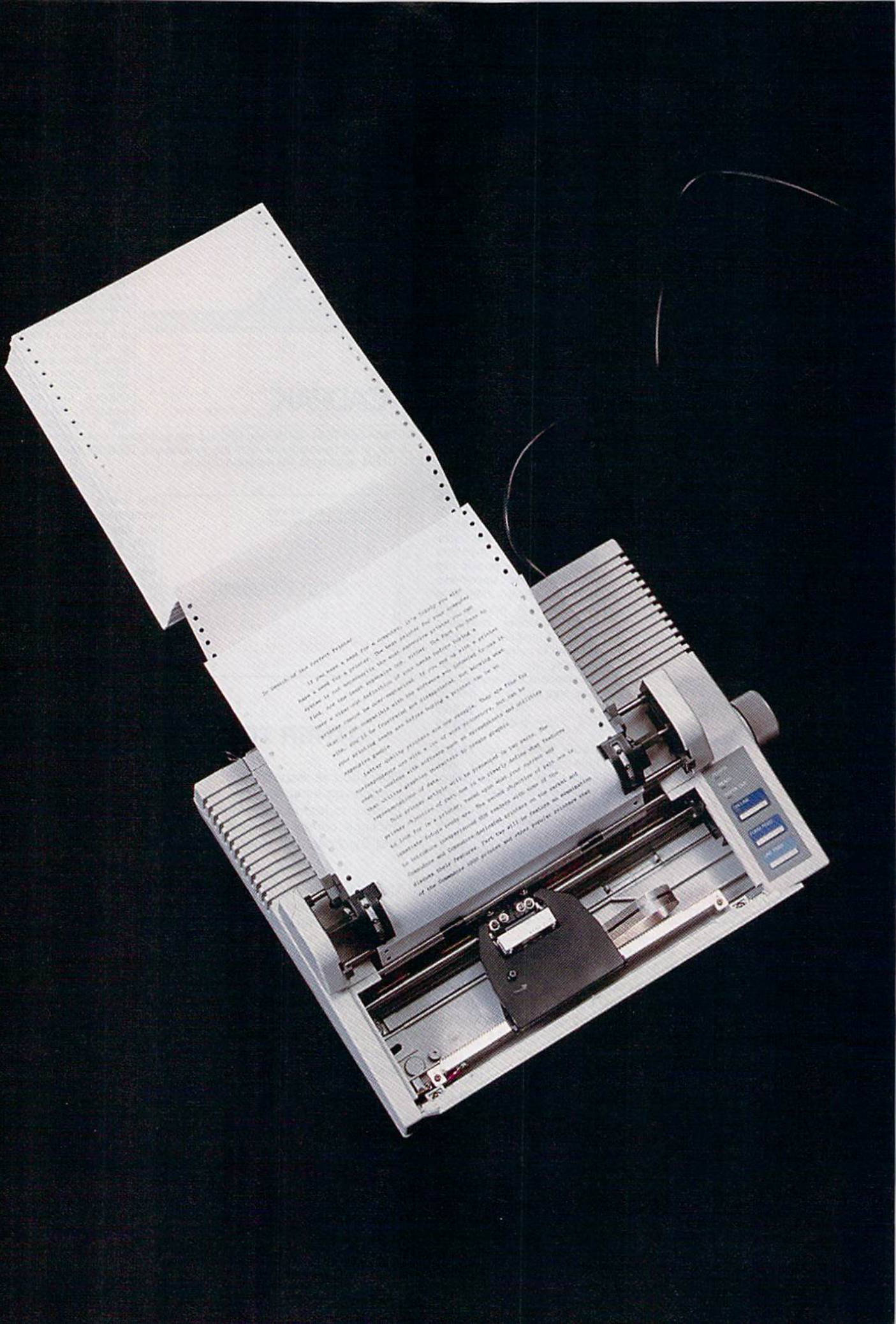
Xper
XPER is the first "*expert system*" for the C-128 and C-64. While ordinary data base systems are good for reproducing facts, XPER can derive knowledge from a mountain of facts and help you make expert decisions. Large capacity. Complete with editing and reporting. **C-64 $59.95**

C-128 and C-64 are trademarks of Commodore Business Machines Inc.
Unix is a trademark of Bell Laboratories

Abacus Software

P.O. Box 7219 Dept. R6 Grand Rapids, MI 49510 - Telex 709-101 - Phone (616) 241-5510

Call **now** for the name of your nearest dealer. Or to order directly by credit card, MC, AMEX of VISA call **(616) 241-5510**. Other software and books are available–Call and ask for your **free** catalog. Add $4.00 for shipping per order. Foreign orders add $12.00 per item. Dealer inquires welcome–1400+ nationwide.



In Search of The Perfect Printer, Part II

Still haven't determined which printer is best for you? To help you decide, here's the conclusion of our look at popular printers for Commodore owners.

By TIM WALSH

What do most beginners look for when choosing a printer? Usually, a low price tag. After all, if the price is right, everything about the printer seems more tempting, and shortcomings in its features and design can be easily overlooked.

This article concentrates on some of the popular, low-priced printers that Commodore owners are likely to buy. With the exception of the Commodore MPS-1000, those discussed below were released a year or more ago. You can still find mail-order ads for the superb Panasonic KX-P1091 and bargain-basement Mannesmann Tally Spirit 80, but you probably haven't seen a recent review of either, since they've been on the market such a long time.

Commodore MPS-1000

We'll begin this examination with a look at the MPS-1000, Commodore's latest release, and surely the most discussed Commodore printer in recent memory.

Actually, the MPS-1000 is a modified Epson Homewriter 10, bearing the Commodore logo and a price tag of $299.95. It is best suited for home use or light office work, and is a good choice for either the beginner or experienced user. It possesses some interesting features that you won't find on any earlier Commodore printer.

However, its printing quality and ability fall a little short when compared to other low-end machines. Its print speed of 100 characters per second (cps) in Draft mode and 20 cps in Near Letter Quality (NLQ) mode are slower than some others in its price range. Also, while the NLQ print quality is good, you'll find better in some other dot-matrix printers of comparable cost. A further major shortcoming is the lack of an italic character set.

Despite its drawbacks, the MPS-1000 has features sufficiently appealing to lure many potential owners away from attractive third-party printers. It works well in day-to-day use, is relatively quiet and easy to use, and it works well with 1525 print routines.

The MPS-1000 is unusual in having both serial and parallel Centronics interface ports. The serial port can access two print modes—Commodore and IBM. The parallel port allows access only to the IBM mode, referred to in the MPS-1000's user's manual as the IBM 5152 Plus mode.

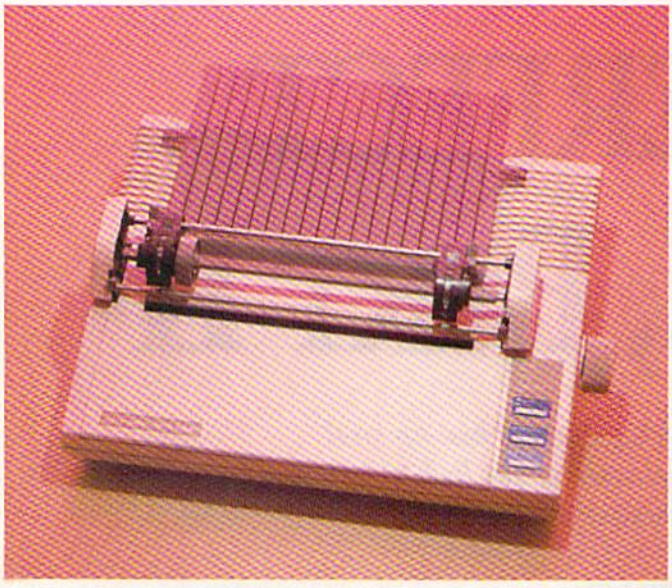
The option of two print modes adds considerable flexibility to this machine. They give you the choice of two Commodore character sets—uppercase/graphics or upper/lowercase. Accessing the IBM mode also gives you two character sets, composed of IBM graphics, standard and international characters. Again, it's important to realize that both the Commodore and IBM modes can be accessed through the serial port, so there's no need to use the parallel port with Commodore equipment.

Although initially you may not think you need both the serial and parallel ports, both together give you three important benefits. First, the serial port lets you use the printer without a parallel interface. Second, the parallel port gives you the option of using the printer with non-Commodore computers. Third, using the parallel port with an interface having a print buffer of large capacity frees up the computer during printing operations.

In Commodore mode, the MPS-1000 is limited in its print features. There is only one print pitch, pica, which prints ten characters per inch (cpi) and can be enlarged to double size, and Draft or NLQ are the two print modes.

Print features accessible via control codes are: underlining, reverse print, programmable line spacing and both single- and double-density graphics.

Eleven secondary addresses in Commodore mode permit a printer reset, custom formatting of print and the activation or suppression of the printer's diagnostic messages. The user's manual, which is loaded with technical information for programmers, devotes an entire chapter to graphics in the Commodore mode and a second chapter to IBM-mode graphics.



Commodore's MPS-1000 printer.

The MPS-1000's IBM mode, selectable via one DIP switch when using the serial port, provides substantially more features than the Commodore mode, including three print pitches—pica (10 cpi), elite (12 cpi) and condensed (approximately 17 cpi)—all of which can be accessed in enlarged print via control codes. In IBM mode, you also have super- and subscript characters, an emphasized print mode and NLQ characters.

To help you begin programming graphics in either mode, the two graphics chapters in the manual contain several examples. You'll quickly notice the advantages of IBM mode, which offers two more density settings than the Commodore mode. Even so, most MPS-1000 users probably find it easier to use Commodore mode for their own graphics programs, since fewer commands are necessary.

If, in using Commodore software, you stay locked into Commodore mode and select Commodore 1525 when asked for your printer type, you'll be able to utilize all the C-128 and C-64 software available. Also, the MPS-1000 has no problems handling high- and low-resolution screen dumps.

Considering cost, is the MPS-1000 the best printer with which to complement your Commodore computer system? The answer depends on your needs. If you want superb NLQ print, look elsewhere; but this is far and away the best printer available for first-time Commodore users. It works with just about all the popular graphics, business and recreational software designed for Commodores, and it permits the growth of your programming abilities.

Seikosha SP-1000VC

This recently introduced high-quality printer from Hattori Seiko is a modified, Commodore-dedicated version of the Seikosha SP-1000A that is covered later in this article.

Since it's designed for Commodore, no parallel interface is needed; you simply connect it to your computer system with the helpfully long (42-inch) serial cable included.

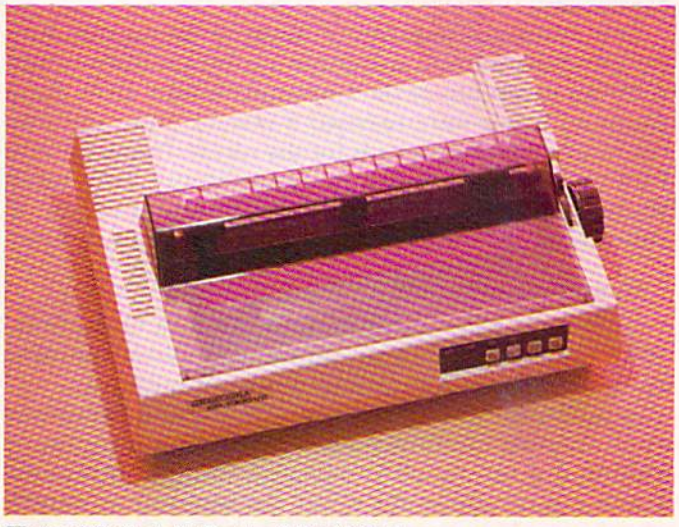
The printer is relatively small (15½ inches wide, 4¾ inches tall and 11 inches deep) and so requires little desk space. It features a low-profile removable tractor unit that is a significant improvement over designs found in other low-end printers. This unit easily and quickly adjusts to permit the use of any tractor-feed labels or continuous forms up to 10 inches wide and three forms thick. Removal of the tractor unit activates a switch that enables the printer to accept single sheets from an adjustable single-form paper holder that you mount in place of the tractor unit.

The SP-1000VC provides an NLQ mode—a 24 × 18 matrix—which you activate by pressing a button on the printer's control panel. Text created in this mode has a very distinct, slightly uneven appearance that distinguishes it from characters produced by other dot-matrix printers.

The print speed of the unit is 100 cps in Draft mode with 10 cpi pica characters; in NLQ mode, it slows down to 20 cps. Print features include standard, reversed and italic character sets, with pica, elite (12 cpi), and condensed (17 cpi) print pitches available in all three sets.

Near-letter quality is available with pica and elite print pitches from within both italics and standard character sets. You use control codes to select ASCII, CBM mode and condensed print. Four DIP switches on the rear of the unit are used to specify page length, device-number setting, perforation-skipping and zero-slashing.

Super- and subscript characters are activated and deactivated through the use of control codes, as are underlining, double-strike character and graphics. However, this printer has a limited graphics capability. It offers only one density setting—the usual 480 horizontal dots per line. But Commodore users will be pleased to note that high- and low-resolution 1525 screen-dump programs work well on this printer.



Hattori Seiko's Seikosha SP-1000VC.

The SP-1000VC also possesses multiple-function online, form-feed and line-feed buttons. As on many other dot-matrix printers, these buttons can be used for a self test or hex dump when you initially turn on the printer.

The SP-1000VC also incorporates user-defined left and right margin-setting controls into the form-feed and line-feed buttons.

Surprisingly, the SP-1000VC's user's manual seems to be written exclusively for beginners. It covers all of the printer's features and provides at least one short Basic program to demonstrate each function. While this is sufficient instruction for control codes and secondary addresses, the manual should have included more information on the Graphics mode. Once you advance beyond the beginner's level, you'll have to look elsewhere for more in-depth graphics programming information.

The unit is unobtrusively quiet in both Draft and NLQ modes. The nylon ribbon is housed in a large cassette and, judging by its hefty proportions, it undoubtedly has a long service life. Replacement ribbons have a suggested retail price of $9.

I give the SP-1000VC high marks in print quality, features and value. It shows a lot of work and determination by a concerned manufacturer to capture a portion of the home-printer market. Its overall quality and ease of use should serve to make this a very popular third-party printer among Commodore owners. Seikosha plans an aggressive marketing campaign that will put this printer in the major discount stores. The SP-1000VC has a suggested retail price of $270.

It is no accident that the two-year-old Panasonic KX-P1091 parallel printer is very popular among Commodore owners.

Seikosha SP-1000A

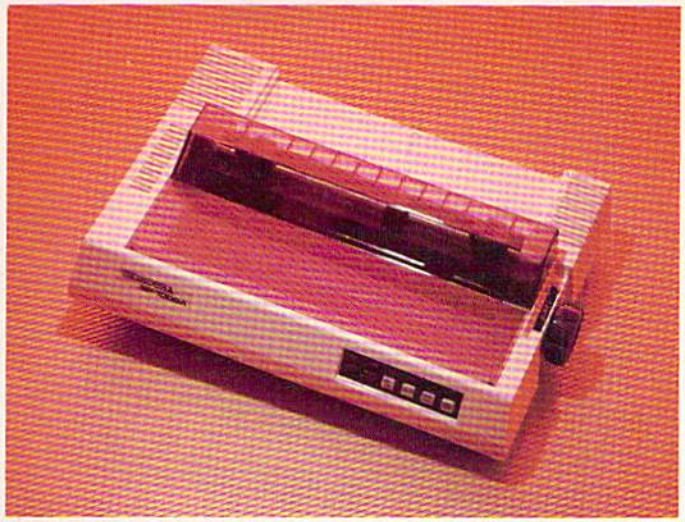
This printer is the parallel interface version of the SP-1000VC and shares most of its print and design features. However, as it is not a Commodore-dedicated printer, a Commodore-compatible parallel interface is required.

There are a number of other features that distinguish the SP-1000A from the SP-1000VC. First of all, it has eight more DIP switches, providing a variety of functions, one of which is to enable you to access characters from 11 languages.

The machine also has a standard 1.5K print buffer that allows storage of up to 95 user-defined characters. The user's manual provides more technical information than that of the SP-1000VC, and it does a superb job of explaining each step in creating user-defined characters, from turning on the DIP switches to placing the characters into the printer's RAM.

The manual includes a particularly nice four-page chart showing samples of text created by mixing every possible combination of print features. More importantly, the manual includes full explanations of which print features have priority over others.

The SP-1000A really shines when it comes to graphics ability. Six settings allow a broad range of graphics printing. In describing how to access these graphics, the manual uses Basic samples that don't require much modification. Commodore owners will appreciate this.



The Seikosha SP-1000A printer.

Finding the right combination of commands and DIP switch settings to perform screen dumps and other graphics might be confusing for beginners. While experimenting with different interfaces, I discovered that the SP-1000A is Epson-code compatible and requires considerable programming experience to program.

I recommend this printer to advanced Commodore computerists who might be hindered by the SP-1000VC's limitations as a Commodore-dedicated printer. If you enjoy designing or modifying software and need a reliable printer, the SP-1000A is well worth your consideration. It has a suggested retail price of $299.

Panasonic KX-P1091

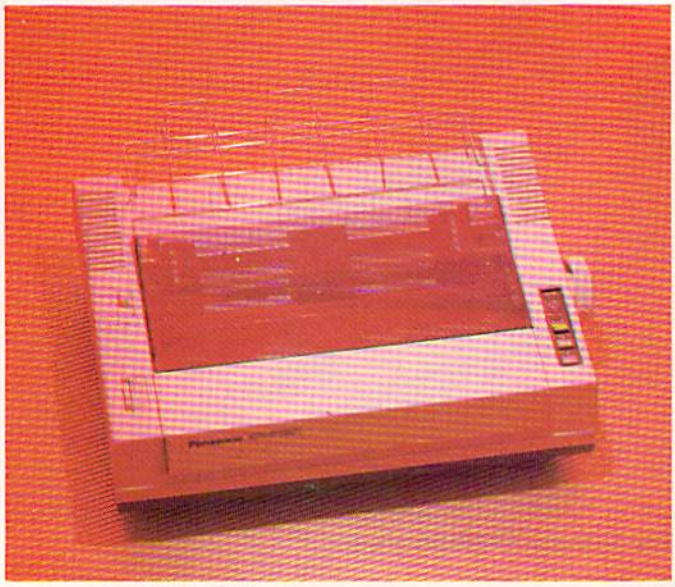
It is no accident that the two-year-old Panasonic KX-P1091 parallel printer is very popular among Commodore owners and is still the most popular printer in Panasonic's line. Although it prints NLQ characters only in 10 cpi pica pitch, the characters, with a matrix density of 18 × 18 dots, are among the best quality you'll find in low-end dot-matrix printers.

The KX-P1091, commonly referred to as the 1091, requires, of course, a parallel interface to work with Commodore computers. At 14.5 lbs. and 16 × 11.5 × 4.5 inches, the 1091 boasts an overall quality of construction that suggests long-term mechanical reliability. It has the usual control-panel buttons for on-line, form-feed and line-feed control, and it also contains a handy switch to toggle between draft, NLQ and compressed characters.

The 1091 features a small but long-lasting cassette ribbon that has an expected life of approximately three million characters. When the print begins to fade, the ribbon is adjustable with a pen or other pointed object. As an added benefit, the cassette ribbon is available in a variety of colors, including brown and blue, as well as the standard black.

With a 120 cps printing speed in Draft mode and a speed of 29 cps in NLQ, the 1091 is faster than much of its competition. It has a 1K print buffer (4K buffer optional) and offers italic, emphasized and expanded type, as well as underlining. You can also create superscripts and subscripts via control codes.

The 1091 has three printing modes that Commodore users can access with control codes or DIP switches. The first is Standard mode, which includes all 96 standard characters. The second is IBM PC Matrix Printer mode,



Panasonic's KX-P1091 printer.

similar to the IBM Character mode offered by Commodore's MPS-1000. The third is IBM Graphics Printer mode, again similar to the MPS-1000's second IBM mode.

The 1091 has very impressive graphics capabilities. It offers seven graphics-density settings, ranging from single-density graphics of 480 up to 1920 dots per row. A wide selection of line spacing commands is available with individual control-code line spacing of 1/8, 7/72 and 1/6 inches. All three print modes provide line spacing in 1/72 and 1/216 increments. Control codes are also used to specify form length in either inches or lines.

The printer's standard 1K buffer is capable of accepting up to 40 downloadable characters. The manual only briefly describes how to perform the character creation, downloading and printing procedure, so beginners are likely to encounter problems.

Enough commercial software is available with print routines for Panasonic printers to give you a wide selection from which to choose. If you want to learn the art of fine-tuning your interface and printer to work with graphics, the 1091 is a good choice.

This is a fine printer and I strongly recommend it for those in need of a fast, low-priced, high-quality printer and for those compulsive programmers who do a lot of printer programming. Because of its many features and unique command format, the 1091 is a challenging printer to use, and, with its suggested retail price of $399, I recommend it to anyone looking for a good dot-matrix printer.

Okidata Microline 182

The Okidata Microline 182 has been around almost two years and has developed a small following of Commodore enthusiasts. It is basically an above-average printer, most of whose features, such as the three print pitches (10, 12 and 17.1 cpi) and emphasized and enhanced print, can be found on just about every dot-matrix printer in its price range.

However, the overall quality of the unit sets the Microline 182 apart from many other printers in the low-end market. It has the quality of workmanship, evident in both operation and appearance, that promises a lengthy lifespan. The printing in Draft mode, at 120 cps, is smooth, quiet and fast. Okidata has a repair contract with Xerox service centers to fix Okidata printers, should any problems develop.

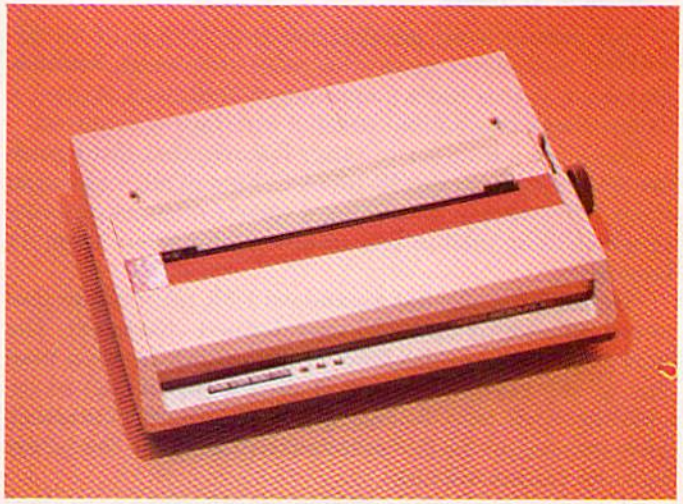
Since this is a parallel printer, you need a parallel interface to use it with your Commodore. Until recently, the Microline 182 lacked an NLQ feature, so the use of an interface that gives you NLQ characters is desirable. Also, like many other non-Commodore-dedicated printers reviewed in this article, the print commands provided in the manual's samples have to be altered slightly to work with Commodore computers.

The Microline 182 offers 120 cps printing in Draft mode and 60 cps in Enhanced mode. Its graphics offerings, which consist of single, double and block graphics, are significantly meager in comparison with some other printers in this price range, but it is capable of printing Commodore graphics with an interface having that capability.

Its manual provides sufficient documentation for experienced users, but if you're inexperienced, you'd probably be happier with its successor, the Okidata 120, since its manual is more comprehensive.

Although the Okidata 120 evolved from the Microline 182, they are different printers aimed at two different markets. The Microline 182 is designed for office environments, and is therefore marketed through computer-

The Microline 182 is not quite as easy to use as the Okidata 120, but it offers a few more sophisticated print features.



The Okidata Microline 182.

specialty stores. On the other hand, the Commodore-dedicated Okidata 120 is a mass-merchandise machine, mainly sold in discount and department stores.

Like other parallel printers that have Commodore-dedicated versions, the Microline 182 is not quite as easy to use as the Okidata 120, but it offers a few more sophisticated print features. It's for that reason that I'd

Circle 107 on Reader Service card.

Great Software for Under $7.00...

And Free Diskettes, Too!

Now is your chance to build your software library at a *very* reasonable cost! For **ONLY $6.99** you can get software for your Commodore or Apple computer. Choose from entertainment, home management or education titles.

As an added **BONUS:** For any merchandise order over $10.00 you will receive one **FREE** universal diskette! These diskettes are double-notched, DS/DD giving single-sided users *twice* the storage at the same great price!

For the Commodore 64/128

Entertainment Series

C-1 Memory Quest
C-2 Sky Fighters
C-3 Atomic Challenger
C-4 Professional Gambler
C-5 The Survival Instinct
C-6 Arcade Action
C-7 Adventure Master
C-8 A PACaLIPS NOW
C-9 Bits, Pieces and Clues
C-10 Board Games 1
C-11 Board Game Challengers
C-12 Chess Champion
C-13 Crazy Corners
C-14 Galactic Empire Builder
C-15 Just Games (With a Twist!)
C-16 Land, Sea & Air Adventures
C-17 Maze Madness!
C-18 Peg Out (The Cribbage Game)
C-19 Star Trek Evolution
C-20 Trivia Quest
C-21 Open—
Golfing Royal St. George's
C-22 Alien
C-23 Bulge—Battle for Antwerp
C-24 Wizard & the Princess
C-25 Ulysses & the Golden Fleece
C-26 Mission Asteroid
C-27 Passport to London
C-28 Passport to Paris

Home Management

C-29 Tax Record Organizer
C-30 Vital Data Keeper
C-31 Wordmaster Senior
C-32 Master Word
C-33 Personal Spreadsheet
C-34 g'BASE, database manager
C-35 My 64—A Computer Tutor
C-36 Commodore 64 Utilities
C-37 Financial Analyzers
C-38 Home and Business Card File
C-39 Home Expense Manager
C-40 Home Finance Organizer 1
C-41 Home Finance Organizer 2
C-42 Home Income Manager
C-43 Home Money Manager
C-44 Home Property Manager
C-46 Personal File Keeper
C-47 Personal Investment Manager
C-49 Electronic Scheduler
C-50 Pro Financial Organizer
C-51 Recipe Box
C-52 Tax Record Organizer

Education Series

C-53 Number Builder
C-54 Number Chaser
C-55 Hide & Seek
C-56 Picture This
C-57 Let's Count
C-58 Time Trucker
C-59 Fancy Face
C-60 Math Manor
C-61 Typing Tutor
C-62 Speed Reader

Electric Book Co.
Education Series

C-63 Why?
C-64 When?
C-65 The Three Bears
C-66 Gingerbread Man
C-67 Baby Animals
C-68 Hoppy the Curious Kangaroo
C-69 Wild Animals
C-70 Tom Thumb
C-71 I Was a Second Grade Werewolf
C-72 Tough Eddie

For the Apple II+, IIc, IIe

Entertainment Series

A-1 Beginner's Cave, an Adventure
A-2 Cave of the Mind, an Adventure
A-3 River Adventure, an Adventure
A-4 Fore!, Golfing Simulator
A-5 Lady Luck
A-6 Space Adventure
A-7 Classic Games
A-8 Android Invasion
A-9 Championship Gambler
A-10 Chess Champion
A-11 Memory Quest
A-12 Wizard & the Princess
A-13 Ulysses & the Golden Fleece
A-14 Mission Asteroid
A-15 Passport to London
A-16 Passport to Paris

Home Management

A-17 The Addresser—Mailing List
A-18 Financial Planner
A-19 General Ledger
A-20 Monthly Budgeter
A-21 Nutrition Monitor
A-22 Securities Portfolio
A-23 Recipe Box
A-24 Database Manager
A-25 Disk Library
A-26 Electronic Calendar
A-27 Electronic Phone Book
A-28 Family Tree
A-29 Personal Spreadsheet
A-30 JWriter, Word Processor
A-31 Utility Master
A-32 Vital Data Keeper
A-33 Typing Tutor
A-34 Tax Record Organizer
A-35 Checkbook Balancer
A-36 JBase

Education Series

A-37 Mr. Math
A-38 Speed Reading
A-39 Beginning Counting
A-40 Counting Skills
A-41 Addition I
A-42 Addition II
A-43 Addition III
A-44 Addition IV
A-45 Subtraction I
A-46 Subtraction II
A-47 Subtraction III
A-48 Multiplication I
A-49 Multiplication II
A-50 Multiplication III
A-51 Division I
A-52 Division II
A-53 Division III
A-54 Division IV

Electric Book Co.
Education Series

A-55 Why?
A-56 When?
A-57 The Three Bears
A-58 Gingerbread Man
A-59 Baby Animals
A-60 Hoppy the Curious Kangaroo
A-61 Wild Animals
A-62 Tom Thumb
A-63 I Was a Second Grade Werewolf
A-64 Tough Eddie

Plus these Super Accessories

- **Universal Blank Diskettes** (for Apple or Commodore) compatible with any 5¼" disk drive. Double-notched, DS/DD disks give single-sided users *twice* the storage at the same great price! Box of 5: $6.99. **Blank Diskettes:** 100% certified, DS/DD, Box of 10: $7.50.

for Commodore 64/128

- **ShareData 300C™ 300 Baud Modem:** Autodial, autoanswer, includes terminal software: $34.95.
- **Utility Cartridge:** 30 functions: $19.95
- **Warp Drive Cartridge:** Faster loading plus more functions for more efficient use of your computer: $19.95

CALL TOLL-FREE
CREDIT CARD ORDERS ONLY
1-800-257-9411
In Minnesota CALL:
(612) 829-1911

VISA MasterCard

Firstline Software, Inc.
P.O. Box 5297
Hopkins, MN 55343-2297

ENHANCER 2000™ Disk Drive $149.95

plus $6.00 postage/handling

Commodore compatible floppy disk drive



ORDER FORM

Please list the ordering number(s) (C-1, A-3, etc.) of the programs(s) you wish to order and return this order form along with your check, money order or VISA/MasterCard information to: Firstline Software, P.O. Box 5297, Hopkins, MN 55343-2297.

I'm ordering the following programs:

___ ___ ___ ___
___ ___ ___ ___
___ ___ ___ ___

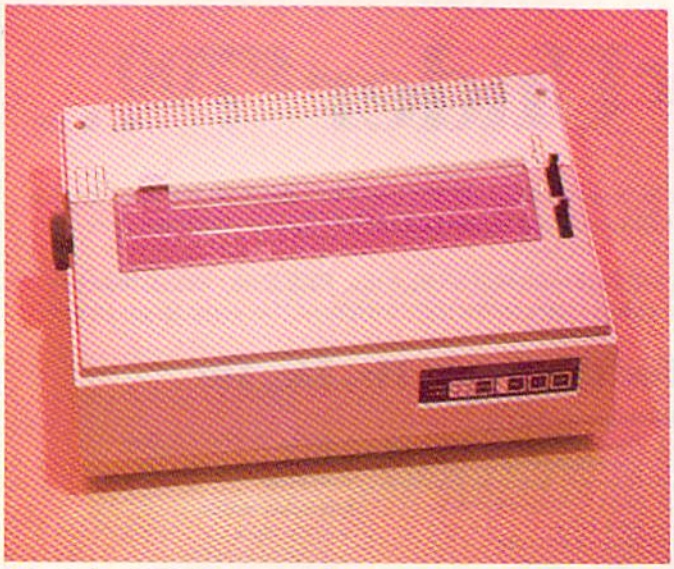
☐ Check or money order enclosed
☐ VISA ☐ MasterCard

Card Number _____
Expiration Date _____
Name _____
Sig. _____ Date _____

Total number of software pkgs. _____ x $6.99 each ..... $_____
Boxes of 5 Universal blank disks _____ x $6.99 per box ... $_____
Boxes of 10 blank disks _____ x $7.50 per box ..... $_____
300C 300 Baud Modem _____ x $34.95 per modem ..... $_____
Utility Cartridge _____ x $19.95 each ..... $_____
Warp Drive Cartridge _____ x $19.95 each ..... $_____
Enhancer 2000 Disk Drive _____ x $155.95 ea. (incl p & h) ... $_____
Total amount of order ..... $_____
Postage/handling ..... $ 2.00
MN Residents add 6% state sales tax ..... $_____
Total (enclose check, money order or fill in VISA/MC information at left) $_____

Money orders/Credit card orders shipped immediately.
Allow 4-6 weeks for delivery for check orders.

Name _____ Address _____
City _____ State _____ Zip _____



The Daisy 1120, from Aprotek.

recommend the 120 for inexperienced computerists and the Microline 182 for others. The 182 has a suggested retail price of $299.

Aprotek Daisy 1120

This daisywheel letter-quality printer from Aprotek contains a curious mix of software and hardware features that make it useful and unique. Although it's not a Commodore-dedicated printer, many Commodore owners have selected the Daisy 1120 for those features.

Foremost on the list are: a low price, a 2K buffer, a 20 cps printing speed, the ability to use Qume- and Diablo-compatible print wheels, and a multitude of paper-handling features and printing commands.

Print features include international characters selectable via a DIP switch, provided the print wheel contains those characters. Other features you can select with the DIP switches include page-length settings, line-feed activation and deactivation and Low Speed mode. The Low Speed mode is 25% slower than Standard mode and is necessary when using daisywheels that lack a prism protrusion. Without this protrusion, the print is weak at 20 cps. Slowing the printing speed alleviates this problem.

Other features accessible through DIP switches are control of data length, baud rate between printer and computer, bit length, parity and interface selection.

The use of control codes instead of DIP switches gives you programmable line feeds, margins, tab settings, and so on. Through control codes, you can also select backward printing, auto-centering and special-character printing. The user's manual lists all codes in hexadecimal form, and the programming samples are in a non-computer-specific Basic that requires a good working knowledge of Commodore Basic to properly convert them.

Control codes allow you to perform such functions as underlining and bold and double-strike printing. The Daisy 1120 is also capable of printing graphics, though in a rather crude fashion. You can create small bar graphs and diagrams, but it's a lot of work. The fact that one character is repeatedly printed, with a partial line feed after each impact during vertical printing, places a lot of strain on the hardware.

Unfortunately, a tractor-feed unit is only optional with this printer, and printing is very cumbersome without it. When printing, the Daisy 1120 accepts up to three copies beneath the original copy. Printing is performed by a film cassette ribbon, but an inked fabric or nylon cassette ribbon can be substituted to increase ribbon longevity.

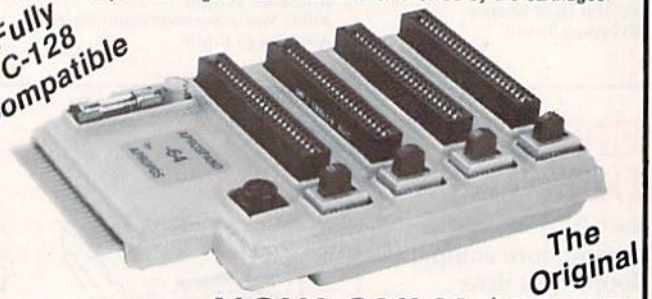
Aprotek's Daisy 1120 emits only 58 decibels in operation. This is whisper-quiet compared to other daisywheel printers.

The 1120, with overall dimensions of 18.7 × 5.5 × 13.0 inches, dwarfs most of the dot-matrix printers reviewed here. Although it appears to be nearly twice the size of Okidata's Microline 182, its weight of 15.4 lbs. is only about one pound more than the Panasonic KX-P1091. Despite this unusually light weight, it emits only 58 decibels in operation—the same as the quiet Microline 182. This is whisper-quiet compared to other low-end daisywheel printers.

The 1120 is a fairly good printer, offering more features and flexibility than Commodore's own daisywheel, the Commodore DPS-1101. Experienced computerists would

APROSPAND-64™ Gives your Commodore 64 or 128 full expandability! This superbly designed expansion module plugs into the expansion port & gives you 4 switchable (singly or in any combination) expansion connectors - plus fuse protection - plus a reset button! Before you buy an expander, be sure that it has a fuse to protect your computer and that you can activate your cartridges in **ANY** combination allowed by the cartridges.

Fully C-128 Compatible



The Original

NOW ONLY $29.95

Commodore Interfaces and Cables

Cardprint G-WIZ Printer Interface #1108.....**$46.95**
Cardprint B (without Graphics) #1105.....**$35.95**
Amiga Printer Cable (6 ft) #3040-6MM.....**$17.95**
Amiga Printer Cable (10 ft) #3040-10MM.....**$21.95**
Commodore 6 Pin Serial Cable (5 ft) #3006-5MM...**$ 9.95**
Commodore 6 Pin Serial Cable (8 ft) #3006-8MM...**$12.95**
Add Shipping Per Item: $3.00 Cont. U.S. $6.00 CAN, PR, HI, AK, APO, UPS Blue

APROTEK Daisy 1120, 20 CPS Daisy Wheel..... **$319.95**
Elite 5CD, 10 CPS Daisy Wheel Printer
Commodore Direct Connect + Parallel.....**$184.95**
Add Shipping Per Item: $10.00 Cont. U.S. $22.00 CAN, PR, HI, AK, APO, UPS Blue

All Products have 2 Week Satisfaction or Money Back Guarantee
TECHNICAL INFORMATION (805) 987-2454
CALL TOLL FREE TO ORDER: (800) 962-5800 US
or (800) 962-3800 CA
CA Res. Add 6% Tax. Listed are cash prices. VS & MC Add 3%

APROTEK 1071-A Avenida Acaso, Camarillo, CA 93010

Circle 3 on Reader Service card.

Better Than RISK™

Power-*you know you love it.*



You used to play RISK as a kid. Maybe you still do sometimes—whenever you can get enough people together.

Did you ever wish you could play by yourself? Or make changes in the map? Wouldn't it be great if you could attack North Africa from North America? Or Japan from Brazil?

Announcing Lords of Conquest™ from Electronic Arts.

It isn't RISK... it's better.

It's a conquer-the-world board game that explodes with new life and new possibilities because it uses all the power of your computer. Every battle is alive with music, color graphics, and strategic challenges impossible in a board game.

Imagine...

...having an infinite number of unique maps to choose from, so each game is different.

...marching your armies onto warships for attacks across oceans.

...great multiplayer games, complete with treaties, trades, and treachery.

...playing challenging solo games against an intelligent computer opponent.

...a built-in game editor powerful enough to be called a "Strategy Game Construction Set."

Lords of Conquest. No more mucking around with cards and dice and little pieces of plastic that roll under the couch. Now you're free to concentrate on more important things. Like exterminating the opposition.



A Great Strategy Game

- *Five kinds of forces to fight with—horses, weapons, boats, territory positions, and cities.*
- *Five kinds of wealth to fight for—gold, timber, iron, coal, and herds of horses.*
- *For 1-4 players. As fun for one as it is for four.*



New Worlds to Conquer

- *An infinite variety of game maps.*
- *Create your own, or play any of 20 built-in maps like Ancient Rome, European Wars, and The World.*
- *The computer can generate unlimited random maps.*



Strategy Game Construction Set

- *Variable game settings—you set the locations and abundance of resources, forces, and transport.*
- *You decide the luck factor.*
- *4 levels of complexity.*
- *9 levels of handicapping.*

ELECTRONIC ARTS™

How to order: Visit your retailer. If you are unable to find the product at your local retailer, you can call 800-245-4525 for direct VISA or Mastercard orders (in CA call 800-562-1112). The direct price is $32.95 for the Commodore version. Apple and Atari versions coming soon. To buy by mail, send check or money order to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add $5 for shipping and handling ($7 Canadian). Allow 4 weeks for delivery. There is a 14-day, money-back guarantee on direct orders. For a complete product catalog, send 50¢ and a stamped, self-addressed envelope to Electronic Arts Catalog, 1820 Gateway Drive, San Mateo, CA 94404. RISK is a registered trademark of Parker Brothers Co. Commodore is a registered trademark of Commodore Business Machines. Apple is a registered trademark of Apple computers. Atari is a registered trademark of Atari. Borderlands and Cosmic Encounter are registered trademarks of EON Software. Lords of Conquest and Electronic Arts are registered trademarks of Electronic Arts.

Lords of Conquest is based on the board game "Borderlands™" by EON—the creators of "Cosmic Encounter."™

Circle 55 on Reader Service card.

commodore

COMPUTER PRODUCTS AT . . .
COMPUTER CREATIONS

Call TOLL FREE for Software Prices Not Listed!!!

ACCESS		Zorro (D)	20
Beach Head 2 (D)	27	**ELECTRONIC ARTS**	
Mach 5 (R)	23	Movie maker	24
Raid Moscow (D)	25	Europe Ablaze	36
ACTIVISION		Heart of Africa	24
Star Rank Boxing	21	Adventure Const. Set (D)	28
Game Maker	27	Archon 2 (D)	24
Great American Cross Country Road Race (D)	21	Mail Order Monsters (D)	24
Hacker (D)	21	Music Const. Set (D)	17
Master of the Lamps (D)	21	Murder on the Zinderneuf (D)	14
Slot Car Const.	27	One-on-One (D)	24
AVALON HILL		Pinball Const. Set (D)	17
Panzer Jagd (D)	21	Racing Dest. Set (D)	24
Super Bowl Sunday (D)	24	Seven Cities Gold (D)	24
Telenguard (D)	19	Skyfox (D)	24
Tournament Golf (D)	21	**EPYX**	
BATTERIES INCLUDED		Ballblazer (D)	27
Paperclip 64 or 128	41	Fast Load (R)	27
Homepak	35	Jet Combat Simulator	21
Consultant 64 or 128	41	Rescue on Fractalus (D)	27
BRODERBUND		Summer Games 2 (D)	29
Bank St. Writer (D)	33	Winter Games (D)	27
Champ Loderunner (D)	23	World's Greatest Football (D)	27
Karateka (D)	21	**FIRST STAR**	
Mask of the Sun (D)	26	Spy vs. Spy (D)	21
Print Shop (D)	29	**HAYDEN**	
Print Shop Graphics Library #1 (D)	17	Sargon 2 (D)	15
Print Shop Graphics Library #2 (D)	17	Sargon 3 (D)	33
Print Shop Graphics Library #3	17	**INFOCOM**	
Stealth (D)	21	Enchanter (D)	23
DATASOFT		Hitchhiker's Guide to the Galaxy (D)	23
Alternate Reality (D)	28	Infidel (D)	23
Bruce Lee (D)	20	Planetfall (D)	23
Conan Barbarian (D)	20	Sorcerer (D)	27
Mr. Do (D)	17	Wishbringer (D)	23
The Goonies	20	Zork I (D)	23
		MICROPROSE	
		Acro Jet: Advanced Flight Simulator (D)	23
		Crusade Europe (D)	27
		Decision in Desert (D)	27
		F-15 Strike Eagle (D)	23
		Kennedy Approach (D)	23
		Silent Service: Submarine Simulation (D)	23
		SPRINGBOARD	
		Newsroom	34
		Clip Art Vol. 1	21
		MINDSCAPE	
		Bank St. Music Writer (D)	27
		Halley Project (D)	27
		ORIGIN	
		Ultima 3 (D)	39
		SSI	
		Battalion Commander (D)	27
		Colonial Conquest (D)	27
		Computer Ambush (D)	39
		Computer QB (D)	27
		Field of Fire (D)	27
		Germany 1985 (D)	39
		Imperium Galactum (D)	27
		Kampfgruppe (D)	39
		Norway 1985 (D)	24
		Phantasie (D)	27
		SUBLOGIC	
		Flight Simulator 2 (D)	36
		Jet	29
		TIMEWORKS	
		Sylvia Porter's Personal Financial Planner	41
		Data Manager 2 (D)	35
		Swiftcalc/Sideways (D)	33
		Wordwriter/Speller (D)	35

COLORED DISKS AS LOW AS 79¢ EA.
FLOPPY DISKS AS LOW AS 59¢ EA.

Fully guaranteed. Includes sleeves and hub rings.
DISKETTES (2 box minimum) 10 per box

5¼"	Black Generic Bulk		Colored Generic Bulk	
BULK	SS/DD	DS/DD	SS/DD	DS/DD
20-69	.69 ea.	.89 ea.	.79 ea.	.99 ea.
70+	.59 ea.	.79 ea.	.69 ea.	.89 ea.

3½"	Verbatim	Sony	Sony
Bulk/Bx. (5)	SS/DD	SS/DD	DS/DD
20 - 69/2-6	1.59 ea.	11.90 bx.	16.90 bx.
70+/7+	1.49	10.90 bx.	15.90 bx.

To order call **TOLL FREE**
1-800-824-7506
ORDER LINE ONLY

COMPUTER CREATIONS, Inc.
P.O. BOX 493 - DAYTON, OHIO 45459
For information, order inquiries, or for Ohio orders (513) 435-6868

Order Lines Open 9:00 a.m. to 8:00 p.m. Mon.-Fri.; 10 a.m. to 4:00 p.m. Sat. (Eastern Standard Time) Minimum $15 per order. C.O.D. (add $3.00). Please specify computer system. Call toll free number to verify prices and availability of product. Prices and availability are subject to change without notice. We ship C.O.D. to Continental U.S. addresses only! Please include 4% shipping on all Hardware orders (min. $4.00). Software and accessories add $3.00 shipping and handling in Continental U.S. Actual freight will be charged outside U.S. to include Canada, Alaska, Hawaii, Puerto Rico and APO. Ohio residents add 6½% sales tax. Canadian orders add 5% shipping, (min. $5.00). All other foreign orders, please add 15% shipping, (min. $10). For immediate delivery send cashier's check, money order or direct bank transfers. Personal and company checks allow 3 weeks to clear. School purchase orders welcome. Due to our low prices, all sales are final. NO CREDITS. All defective returns must have a return authorization number. Please call (513) 435-6868 to obtain an RA# or your return will not be accepted for replacement or repair. **FOR YOUR PROTECTION WE CHECK FOR CREDIT CARD FRAUD.** We do not bill until we ship.

probably prefer the Daisy 1120. With a suggested retail price of $299.95, it's a fairly good value.

Mannesmann Tally Spirit 80

Although production of the trusty Spirit 80 ceased about ten months ago, a precious few still remain in the inventories of various mail-order houses. In spite of their decision to discontinue this printer, the people at Mannesmann Tally have assured me they will continue to provide support and service for this printer.



The Mannesmann Tally Spirit 80.

Due to its popularity and unique design, the Spirit 80 is likely to become a collector's item. With that in mind, I felt this article wouldn't be complete without at least mentioning it.

The Spirit 80 is a parallel printer and therefore requires a parallel interface when used with a C-64 or C-128. The fact that this printer has played a significant role for many Commodore computerists is reflected in the amount of software available with Spirit 80 print routines.

The Spirit 80 has a sleek, modern appearance that makes it look almost as contemporary as some of the low-end dot-matrix printers offered by Epson, Star Micronics and Okidata. Its print features include a speed of 80 cps, pica and compressed printing and double-size expanded in both modes. It also has standard and double-density bit-image printing capability. It comes with a small but thorough manual that does a good job of explaining how to program the printer.

Perhaps the most compelling reasons to consider purchasing a Spirit 80 are its sturdiness and the abundance of available software. Like other parallel printers, it's more of a programmer's machine than a neophyte's delight, but if you're fortunate enough to find and buy one of these classic printers, you're likely to be delighted with it. Prices are currently in the $200 to $230 range. R

Address all author correspondence to Tim Walsh, Technical Editor, RUN *magazine, 80 Pine St., Peterborough, NH 03458.*

Circle 184 on Reader Service card.

NOW USE BOTH SIDES
OF YOUR DISKETTE!

5¼" DISKETTE HOLE PUNCH



WITH HOLE GUIDE
and EDGE GUIDE

PUNCH OUT IS ALWAYS IN THE RIGHT POSITION
Available for IMMEDIATE Shipment

only $10.00 EACH add $2.00 EACH shipping
CHECK OR MONEY ORDER

DEALERS WANTED

FOR OTHER THAN APPLE AND APPLE LOOK-A-LIKES-
WE HAVE A TEMPLATE TO POSITION A REGULAR
ROUND HOLE PUNCH FOR THE READ ENABLE HOLE
NEAR THE CENTER

COST— 4 for $2.00

N.P.S. Inc.
Dept.
1138 BOXWOOD RD. JENKINTOWN, PA 19046
(215) 884-6010

Circle 81 on Reader Service card.

COPY II 64/128™

BACKUP PROTECTED SOFTWARE FAST.

From the team who brought you COPY II PLUS (Apple), Copy II PC (IBM) and COPY II MAC (Macintosh) comes a revolutionary new copy program for the Commodore 64 and 128 computers.

- Copies many protected programs—automatically. (We update Copy II 64/128 regularly to handle new protections; you as a registered owner may update at any time for $15 plus $3 s/h.)
- Copies even protected disks in under 2 minutes (single drive).
- Copies even protected disks in under 1 minute (dual drive).
- Maximum of four disk swaps on a single drive.
- Includes fast loader, 12-second format.

Requires a Commodore 64 or 128 computer with one or two 1541 or 1571 drives.

Call 503/244-5782, M–F, 8–5:30 (West Coast time) with your in hand. Or send a check for $39.95 U.S. plus $3 s/h, $8 overseas.

$39.95

Central Point Software, Inc.
9700 S.W. Capitol Hwy. #100
Portland, OR 97219

Central Point Software INCORPORATED

Backup utilities also available for the IBM, Apple II and Macintosh.
This product is provided for the purpose of enabling you to make archival copies only.

CONVERSE WITH YOUR COMPUTER

ELIZA-64

Artificial Intelligence Demonstration Program

BREAK from games and technical programs and AMAZE and INVOLVE your family and friends.

Eliza-64 is a Commodore 64 adaptation of the famous Eliza program developed at MIT. Eliza acts as a psychotherapist analyzing your input and responding with an appropriate comment or question.

GREAT FAMILY AND PARTY ENTERTAINMENT

NOW ONLY $19.95

Ohio residents add 5½% sales tax.

To order call Toll Free 1-800-638-2000
or send check or money order to:

OMEGA-SOFT
P.O. Box 3686 Dept. R
Mansfield, OH 44907

Disc Only *Machine Language Fast*

(dealer inquiries invited)

Circle 96 on Reader Service card.



A powerful word processing system for the Commodore 64.

Includes: On screen status/help display • 30 Fonts ready to use
Font editor/creator included • BACK-UP DISK INCLUDED

From the author of *FONTMASTER* comes ***FONTMASTER II***. A vastly improved version of the AWARD-WINNING* program *FONTMASTER*. This powerful word processor, with its many different print styles (fonts), turns your dot matrix printer into a more powerful tool. Term papers, newsletters, and foreign languages are just a few of its many applications. Here are some of its capabilities:

Word Processing Features
- Over 65 powerful commands make text editing a breeze
- Headers / footers
- Page numbering in decimal or Roman
- On-screen underlining
- On-screen status-display, including pictures of font and special effects selected
- 80-column video preview
- On-screen foreign language capability (creator included)
- Form-letter / data merging
- Reads and writes either PRG or SEQ text files
- Help screens
- Right-to-left editing features for foreign languages (Hebrew, Arabic, etc.)

Word Processing Printing Features
- 47 two-letter format controls (embedded in text files)
- Fractional-character spacing used on word-wrap, justification, centering, and right alignment
- Proportional spacing (user-adjustable)
- Columnar printing (up to 4 columns)
- Overlaying of 2 or more characters (for phonetic markings, diacritics, etc.)
- 27 single-keystroke text modifiers (embedded in text files) Combine any or all of the following effects: underlining (adjustable) — more than 20 pitches — more than 50 line spacing sizes — condensed text — expanded text — boldfacing — inversion (white letters on black) — Superscripts (adjustable) — Subscripts (adjustable) — 3 text heights (micro-normal-tall)

Setup Module
- Two system setups can be made. In each the user can select his preference of colors (screen, text, border), printer interface (18 choices), and printer (over 50 choices)

Font & Character Set Creators
- Disk commands for maintenance of fonts or sets
- Grid for character creation / editing (manipulated with cursor keys, joystick, or light pen)
- Editing commands include: invert, flip, negate, shift, clear, copy
- Grid-dump to printer
- Character can be printed while editing (font creator only)

* Outstanding original programming
1985 International Summer Consumer Electronics Show

Bauhaus	ΞΨζθξβΦ	ɔoɹɹiM	±†§½□@π
Block	Hairpin	**News**	**Split**
Bold	הדהעישפקא	Print	**Stopbold**
CELTIC	*Italic*	ЧшДёюжЗ	**Tech**
English	LED	*Script*	Typewriter
Futura	**Manhattan**	Shadow	uoodɐɹɪsdu

...and more

Xetec, Inc. • 2804 Arnold Road • Salina, KS 67401 • (913) 827-0685

RUN

T-Shirts

- 100% Cotton, Short-sleeved Shirts
- White with Colorful RUN Logo & Design

Sizes: S, M, L, XL **Price:** $9.95 each

Complete coupon, send cash, check, or money order payable to **RUN Magazine.** Allow 6–8 weeks for delivery.

NAME

ADDRESS

CITY STATE ZIP

QUANTITY SIZES

AMOUNT ENCLOSED

Mail to: RUN Special Products
80 Pine Street • Peterborough, NH 03458

"My purchase of RUN is a better investment than my computer—I get a much higher return on a much smaller investment!"—

D. Suggs, Tallahassee, Fla.

Join the thousands of C-64, Plus/4, and VIC-20 users around the world who enjoy subscribing to **RUN** every month. They've found **RUN** to be an unrivaled Commodore resource. And they're right—**RUN** is one of the fastest-growing Commodore magazines on earth!

The convenience of personal delivery, plus a savings of **44% off** the newsstand price are yours when you subscribe to **RUN**—the year-round Commodore companion.

You get **12 great issues for just $19.97,** plus special announcements and offers available only to **RUN** subscribers!

Each month, you'll learn the fun of computing while exploring the limitless possibilities of your Commodore.

Here's what satisfied readers are saying:

"I read many magazines after I bought my 64, but I think that yours is the best. I now have a subscription and look forward to every new issue."—Eric D. Stolen, Manistee, MI

"In a remarkably short time, **RUN** has become the best journal for Commodore computer users...I appreciate the coverage you devote to reader comments and questions (Magic, Mail RUN, and Commodore Clinic), as there is nearly always an interesting hint or tip in one of these columns!"—J. O'Hare, Victoria, B.C. Canada.



Throughout the year, you'll find:

- Exciting tips, Commodore tricks, and programming ideas in **RUN**'s most popular column, "Magic".
- Challenging, fun, and educational software.
- A rundown of the products best suited for the new C-16 and Plus/4.

The benefits roll on...time-saving programming ideas, no-punches-pulled product reviews, applications to broaden your computing horizon, tutorials and assistance from reknowned authors in the Commodore field, and of course, great ideas and tricks that have worked for fellow Commodore users.

Act today—and **save 44%**—joining the thousands of subscribers who've found that **RUN** is their best computing companion. Just send in the coupon or insert card, or call **TOLL-FREE 1-800-258-5473.** In NH, dial 1-924-9471.

Commodore 64, VIC-20 and PLUS/4 are registered trademarks of Commodore Business Machines, Inc.

YES! I want to make a great investment.

Send me 12 issues of **RUN** for the low subscription price of $19.97. I'll save 44% off the newsstand price.

☐ Payment enclosed ☐ Bill me

Name _____

Address _____

City _____ State _____ Zip _____

Canada & Mexico $22.97; Foreign Surface $39.97, 1 year only, US funds drawn on US bank. Foreign airmail, please inquire. Please allow 6 to 8 weeks for delivery.

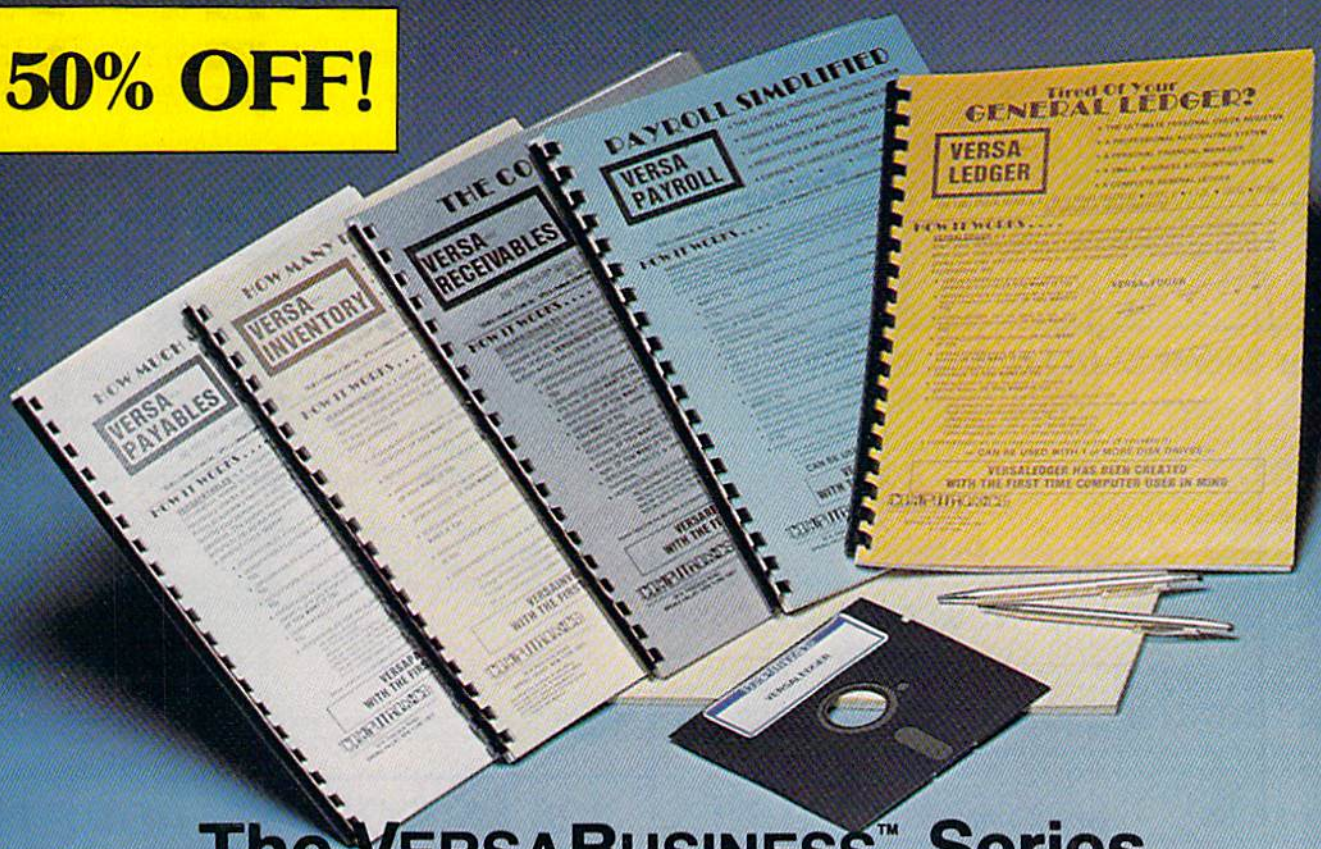
RUN • Box 954 • Farmingdale, NY 11737 366B5

RUN

Introducing the Most Powerful Business Software Ever!

FOR YOUR IBM • APPLE • MAC • TRS-80 • KAYPRO • COMMODORE • MSDOS OR CP/M COMPUTER*

50% OFF!



The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

FOR COMMODORE OWNERS ONLY!

Commodore owners *only* may now take 50% off our listed price of any module(s) from our VersaBusiness Series. All sales are final (our normal 30-day money back guarantee does not apply to sale items).

To Order:
Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add $3 for shipping in UPS areas
- add $4 for C.O.D. or non-UPS areas
- add $5 to CANADA or MEXICO
- add proper postage elsewhere

DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

Circle 9 on Reader Service card.

Circle 189 on Reader Service card.

KEY MASTER

One of the easiest-to-use, most powerful disk backup programs ever written for the 64. Working with the 1541 or the 1571 KEYMASTER is like getting two copy programs for the price of one. its main feature comes with 50 keys that unlocks protected disks by ELIMINATING the protection scheme originally written on the disk.

Once one of the KEYMASTER'S KEYS has unlocked a disk, the program can generally be FILED COPIED onto another disk (also making the program compatible with non-1541 drives.)

In addition to the UNLOCKING KIT it contains a powerful yet easy to use general purpose copier for the programs not listed as a key.

- **ith One 1541:**
  - **FAST** FILE COPIER - up to 5 times faster!
  - **FAST** full protected - disk GCR nibble copier works in only 75 seconds
  - **FAST** full unprotected - disk copier.
  - **FAST** 10 second disk formatter.

Wirth Two 1541's:

- **FAST** file copier - up to 6 times faster!
- **FAST** full protected - disk GCR nibble copier works in only 37 seconds!
- **FAST** full unprotected - disk copier.

- **50 KEYS** for popular programs will be provided on the first KEYMASTER disk. Frequent updates of 25 to 50 additional KEYS will be available periodically. (No original disk return required for updates!).

ALL OF THIS AT THE RIGHT PRICE! ONLY —

$29.95

$10.00 for update disks
KEYMASTER created by Jim Drew

Top Secret Stuff I & Top Secret Stuff II

Programed by Jim Drew

Are both collections of 20 programs per diskette (that works out to about 50¢ per program!) that help you explore and enhance your Comodore 64 and/or 128 and 1541 disk drive. Now you can unlock many secrets formerly known only to top machine language programmers by using these sophisticated "tools." If you have ever been curious about the inner workings of your computer system, now is your chance to dig in and find answers with the help of these programs. These collections of progams have gotten rave reviews from actual users, and we are sure that you, too, will be pleased.

Both for only **$19.95**

TOOLBOX 64 AND NEW TOOLBOX 128

Side 1 contains over 100 routines, some of them are for protection, smooth scrolling, modem routines and sound and color. Also a bootmaker, paddle and joystick test; read terminal, and auto dial and auto answer. Documented routines allow you to use them to build your own programs or use alone. This disk has a lot of tricks that are used in commercial software.

Side 2 contains several of the same routines for the 128 system but also a T&S editor for going out to track 66, along with a screen dump for the 80 colum mode and lots, lots more.

Side 1 C-64 **Side 2 128** All for **$19.95**

D-CODER

- Translates any machine language program into easy-to-read English descriptions with complete explanations of each command.
- Makes complete notations of all important memory locations accessed by the program (SID, VIC, MOS, KERNAL, etc.)
- Gives you three ways of accessing programs:
  1. **Will read and list programs from DISK**
  2. **Will read and list programs from MEMORY**
  3. **Direct user input (from magazines, etc.)**
- Can be used to locate and examine any machine language program's protection routines!
- Can be used to easily break apart machine language programs for study and examination!
- Printer option for complete hard copy listings!

$19.95

You no longer need to be an EGGHEAD to read Machine Language.

N-CODER

THE PERFECT COMPANION PROGRAM TO D-CODER!

Allows you to easily make changes in machine language programs . . . right on the disk!

- Rewrite ability allows code to be altered and then rewritten directly to the disk!
- Features sector-by-sector scrolling assembly language display of machine language programs!
- Notation of ASCII text equivalents for easy spotting of embedded text strings!
- Handy reference display of all assembly language commands and their ML numerical equivalents!
- Byte splitter for easy splitting of decimal addresses into low byte-high byte format!

$19.95

SPECIALS

Disk notcher **$5.99**
Double your disk capacity with this little tool!
Generic Disks DS/DD . . . . . **79¢**
300 Baud Modems with Swifterm and Quantum Link **$39.95**

GRAPHIC LABEL MAKER

Give your labels the professional touch. With Hi Rez Graphics make your own design or use one our 60 premade labels with easy to use on screen editor. You can insert up to three lines of text then choose the picture you want to put on the left hand side of the label. Then you can print out as many labels as you want. This has got to be the neatest label program out there.



**Now works with Print Shop*

**Also available — the x-rated Graphic package for the 64 and your print shop. There's 60 Hi Rex pictures*

$24.95

PHOTOCOPY

PHOTOCOPY is a graphics integration program which lets you create NEWSROOM photos and banners from other graphics programs. Files also can be converted from NEWSROOM to PRINTSHOP. Photocopy is an idea enhancement to NEWSROOM giving you the versatility to increase your graphics library.

- Photocopy will convert NEWSROOM photos to PRINTSHOP
- Phtocopy works with a variety of files "DOODLE, FLEXIDRAW, PRINTSHOP, SCREEN MAGIC GRAPHICS BASIC, COMPUTER-EYES".
- Photocopy will convert a NEWSROOM photo or banner to a PRINTSHOP graphic.
- Photocopy works with the 1541, 1571 and the Indus drives.

$19.95

Newsroom, Doodle, Printship, Flexidraw, and Graphics Basic are trademarks of Springboard Software, City Software, Broderbund Software, Inkwell Systems, and Hesware respectively.

128 80-COLUMN ADAPTER

A dual purpose adapter that gives you 80-columns of monochrome text in the 128 mode. A switch is provided to toggle between 40 and 80 mode. Both sound and video cables are included for a complete hook-up.

$19.95

Turtle Graphics II
Bravo
Maze Master
Lazer Zone
Turtle Toyland Jr.
Gridrunner II
Pitfall
Minnesota Fats
Frogger
Q-Bert
Popeye
Quality Joy Stick
Rootin Tootin

While Supplies Last!

Your Choice $9.95 Each

WANTED: PROGRAM SUBMISSIONS

Megasoft is currently seeking quality program submissions for marketing on a national scale. We pay good royalties and can work several options. If you feel that you have something of interest, call (206) 687-7176 for more information. Unique utilities and hardware devices a plus.

Tele-Communications Package

A complete package for several uses. One disk includes 64 Swifterm, 128 Swifterm and the War Games auto dialer. Three packages all for the price of one!

$19.95

GRAPHICS AND GAME DISK

A stimulating x-rated adventure game, complete with graphics representations. This is not your typical adventure game. FEATURES ANIMATED: X-RATED CARTOONS

*Joystick required

$24.95

THE XXXXXXXXX

X-RATED GRAPHICS LIBRARY

Your Print Shop May Never Be The Same!

X-Rated Graphics guaranteed to spice up your special letterheads, greeting cards, signs and banners! Everything from mild to Look Out Nelly! 60 Erotic additions to heat up your print shop graphics library, plus 5 ribald Screen Magic additions!

Print Shop is a trademark of Broderbund.

$24.95

64-128 CROSS REFERENCE BOOK

This is the first book available of its kind. Complete cross-references used to covert 64 programs over to the 128 computer. Book is formated on the left side with the location and label name, and then on the right with the equilvent 128 location. The entire range of memory is covered starting at 0-Page going thru BASIC and then thru the Operating System. A must for the serious 128 user.

$12.95

MAGNUM LOAD

Programed by Jim Drew

MAGNUM LOAD is a new replacement KERNAL (operating system) ROM chip for your Commodor 65 or 128 computer that will load and verify programs up to 6 times faster than before. The tape routines have been removed from the old chip and in their place have been put a high-speed loader, high-speed verify, and disk driver no-head-rattle routine. Unlike the older cartridge fast loaders, no ports are tied up at the rear of the computer, the screen is not blanked during loading and there is no wear-and-tear on the expansion port. For maximum convenience and performance, the chip is installed directly in the circuit board. Generally a socket has already been provided to make the operation easy, but occasionally some soldering may be required. Now you can give your 1541 disk drive "1571 speed."

Rather than give you more exagerated claims about how many times faster our ROM chip is compared to the slower cartridge versions, a comparison chart is supplied listing MEASURED loading times.

Program	Star-Dos	Reg. Load	Mach 5	Fast Load	MAGNUM LOAD
Pitstop II	?	144 sec.	43 sec.	41 sec.	**31 sec.**
Music Shop	?	105 sec.	105 sec.*	105*	**21 sec.**
Hitchhiker's Guide to the Galaxy	?	70 sec.	70 sec.*	N.G.**	**68 sec.**
On-field Football	?	149 sec.	66 sec.	63 sec.	**56 sec.**
EASY FINANCE I	?	58 sec.	13 sec.	13 sec.	**11 sec.**

$24.95

For 1541 or MSD Version

*Will not fast load - defaulted back to regular load

**Failed to load at all

A Copy - Nibbler for the Amega
A Disk - A 2nd drive Imulator for the Amega
A Filer - A complete File PRG for the Amega
A Report - A complete Report Writer for the Amega
A Term - Excellent, easy to read Terminal Package for the Amega.

SOFTWARE PROTECTION HANDBOOK

4th Edition!

SOFTWARE PROTECTION HANDBOOK Fourth Edition! Now Available!

If you're **tired** of being harassed by **protected software** and too many **copy** programs, then this is the book for you! This 250 page manual covers the gamut from legalities to protection methods to step-by-step back up procedures. Now you can learn both how to **protect and unprotect** software! The techniques covered include copying cartridges to tape or disk, tape protection, and disk protection. Disk protection covers error numbers 20, 21, 22, 23, 27 and 19 **plus** single track formatting, header modification, header swapping, half track reading and writing reading and modified bit densities, formatting illegal track/sectors, sync writing and **more!** Forth addition contains the most unusual and innovative protection analysis tool for the Commodore yet! - **not for Beginners** - This system expands your 1541 drive giving capability otherwise only possible for **professional** disk duplication equipment, now you can create or analyze exotic forms of disk protection. **'D.O.S. Kings' Take Note!** - Entire tracks of data can be read and written without regard to 'standard' sync and format. You are no longer limited to sector by sector searches. Whole track readouts reveal hidden data even when all or most of the sectors have been erased. Uncovers and writes data under errors, pulse coaded sync or data, hidden data and access codes, multiple track densities and more! This manual covers the complete implementation of the track trap system including necessary software and hardware documentation.

C-64 Book Only ..... **$19.95** US

Book & Disk of all Programs ..... **$29.95** US

This manual does not condone piracy

64 BBS

Full performance boards with lots of extra's not found on others. Both boards have message rooms that can be setup for a variety of different uses. Each room can have it's own access level assigned for maximum control.

- 7 read and write rooms with up to 8 security levels
- Public message base and sysop's mail box
- Secret highest level for complete access of all functions.
- Auto cycling of E-mail.
- Remote access for system operator. Boards activity can be sent to printer.
- 300/1200 baud selectable
- Up and down file transfers with a choice of access levels.
- New punter and X-modem protocol supported.

$39.95

128 BBS

This is the first complete 128 bulletin board of it's kind. All the features of the 64 board and more. The board takes advantage of the extra memory by providing a complete seperate sub-board. User can have both boards available at the same time. Imagine running an open board for everyone a secret closed board for the more serious users. Look at these features.

- Print out boards activity to include what files accessed and by who.
- Faster performance and more storage using the 1571 drives.
- Supports the use of over 500 users!
- Both boards will support and work on any type of disk drive including the big 1 meg. SFD's.

$39.95

Both modems work on the 1650, 1670 and their compatibles.

DIR+
A DISK LIBRARY CATALOGING PROGRAM

Having problems finding that lost disk? Here's a program that allows you to alphabetize and print out your program names in a versatile format. A scrolling arrow allows you to edit out meaningless names and keep what you want. Know what you got and where its at!

- 60 to 600 titles (1 to 5 COLUMNS) can be printed per page by using optional condensed printing.
- Print disk labels with your disk names and ID's.
- Can support up to 1100 program titles and can alphabetize in less than 15 seconds!
- Save the master list to disk for use with a word processor or a data base.

ONLY $19.95

Dealer and Distributor Inquiries Invited.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders. Canada orders must be in U.S. Dollars. VISA — MASTER CARD — C.O.D.

Programs for C-64/128 $3.00 S & H on all orders

Software Submissions Invited

VISA MasterCard

MegaSoft Limited

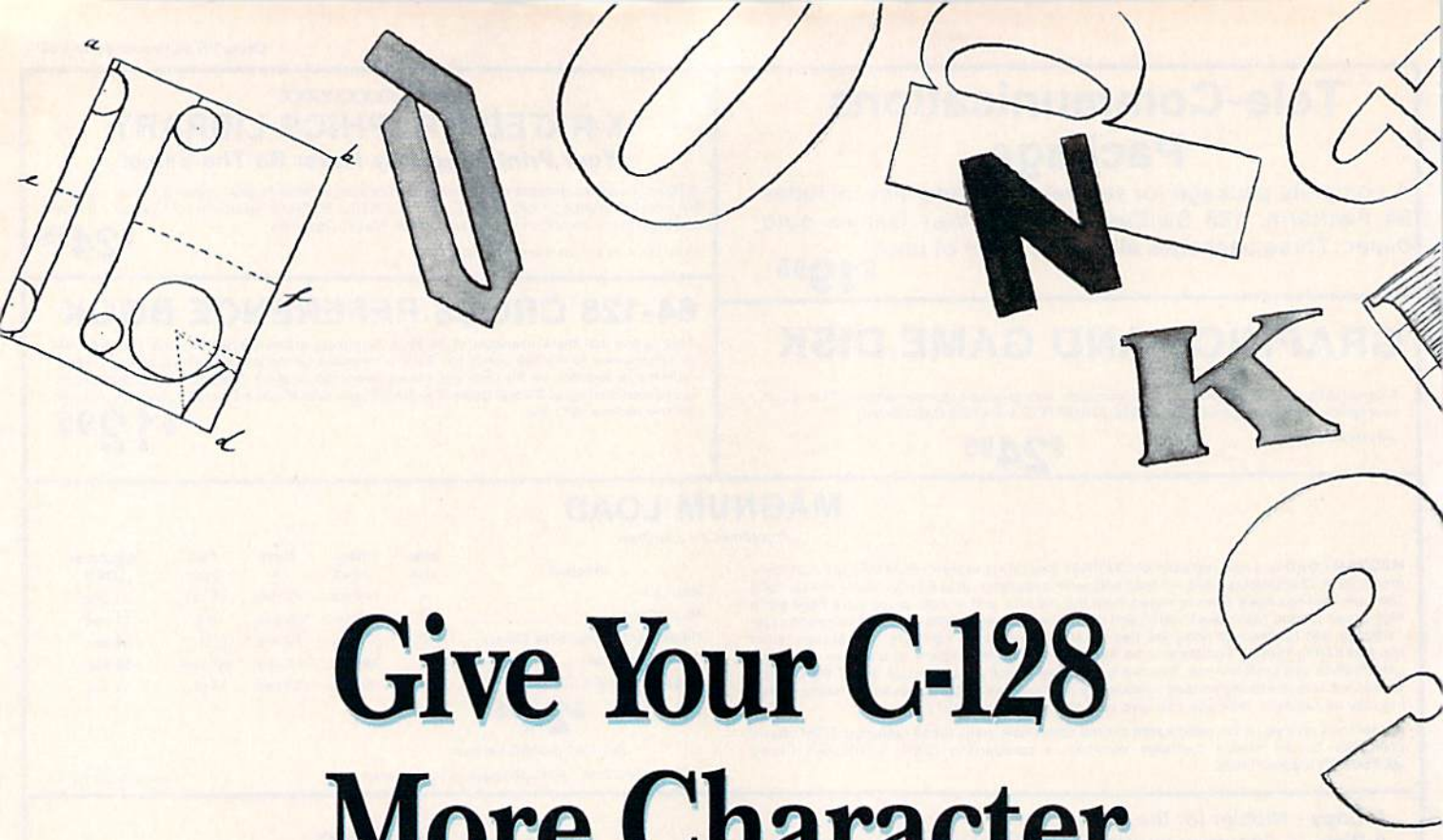
P.O. Box 1080, Battle Ground, Washington 98604

Phone 800-541-1541 • BBS orderline after 5 p.m. P.S.T. • 206-687-5205

Tech. Line & Foreign & In Washington state orders - 206-687-7176

TELEX 4949909/MEGAS

In Canada: P.O. Box 10, Parry Sound, Ontario, Canada PZA2X2 • Phone 705-746-8081



Give Your C-128 More Character

By FREDERICK GODDARD

Now you can redesign any or all of 512 characters and use them in your C-128 and C-64 programs.

The accompanying program, 80-Column Characters (Listing 1), lets you create your own character set, which can then be used in both 40- and 80-column modes and in the C-64 mode. First, I'll explain how the C-128 operates in 80-column mode. Then I'll provide a short Basic subroutine that allows you to use custom characters with 80 columns in your programs. Finally, I'll describe the 80-Column Characters program.

Although the *Commodore 128 System Guide* does not say so, it is actually easier to change the character set for the 80-column than for the 40-column mode. In the 40-column mode, the C-128 uses the same VIC chip as the C-64. This chip operates through the interrupt routine and reads the character set from memory 60 times each second.

This is a disadvantage when you try to design and use customized character sets in 40-column mode. You cannot run your program in Fast mode; you can only see 256 characters on the screen at any one time (128 characters each in normal and reverse); and you must normally give up 2K or more of memory to provide RAM storage for the character set as long as you use it.

80-Column Screen Mode

In 80-column mode, the C-128 operates in a completely different manner and without any of the drawbacks mentioned above. The 80-column mode is controlled by a separate processor, the 8563, which has its own independent memory. This processor displays all 512 characters on the screen at the same time. In addition, it provides for optional underlining of any character and automatically generates either a block (reverse) or underline cursor. This means you don't have to design reverse or underline characters in your set of 512; the 8563 does it for you.

Since you can have 512 different characters on the screen at the same time, and a normal full ASCII upper- and lowercase text set is only 96 characters, it is possible to design five different character fonts and display them on the screen simultaneously. For example, you could have regular, boldface, italic, italic-boldface and superscript character sets, all with optional underlining.

Since the 8563 chip has its own memory, you need allocate RAM for your character sets only temporarily. On startup, the C-128's 6510 microprocessor sends the character set data (the same ROM characters used by the VIC chip) to the 8563 through an initialization routine. The 8563 stores this information in its own

RUN It Right

C-128 (in 80-column mode)
Disk drive



Illustration by Hal Mayforth

memory. You can, through this initialization routine, load your own custom character set into the 8563 memory, replacing the original set and freeing for other uses the RAM memory you had been using.

Changing 80-Column Characters

The initialization subroutine is used in the 80-Column Character program and is found in lines 40–80. This short, five-line Basic subroutine loads the character set from disk and creates and runs a machine language subroutine to perform the 8563 initialization.

The C-128 memory-management system uses 16 address banks to keep track of the various areas of ROM and RAM. This bank address system is described on page 370 of the C-128's system guide.

For the present discussion, it's important for you to know that bank 0 addresses the 64K of RAM that holds operating-system variables, 40-column screen memory and your Basic program text; bank 1 addresses 60K of RAM reserved for variables and strings; bank 14 addresses character ROM; and bank 15 addresses the Kernal routines that control the C-128 operating system. The machine language subroutine uses the existing Kernal routine found at $FF62 (65378 decimal) in ROM bank 15.

I could write a long machine language program that duplicates this ROM routine. Instead, I've written a very short wedge that uses the ROM routine but fools it into getting its data from RAM bank 1 instead of ROM bank 14. The Basic subroutine to load and initialize a custom character set is as follows.

```
20 POKE58,DEC("D0"):CLR:GOSUB30:
   GOTO90
30 BLOAD"CHRSET80",B1,P53248
40 RESTORE60:FORI = 0TODEC("2B"):
   READX$:POKEDEC("0200") + I,
   DEC(X$):NEXT
50 BANK15:SYSDEC("0200"):RETURN
60 DATA A9,20,8D,A2,02,A9,22,8D,
   A3,02,A9,02,8D,A4,02,20,62,FF
70 DATA A9,AD,8D,A2,02,A9,00,
   8D,A3,02,A9,FF,8D,A4,02,60
80 DATA A2,01,BD,F0,F7,AA,AD,00,FF,60
90 POKE58,DEC("FF"):CLR
```

You should place this Basic subroutine at the beginning of any Basic program that uses 80-column custom characters. Line 20 changes the top-of-memory in RAM bank 1 so that you can safely use memory starting at $D000 (decimal 53248) to make temporary space for the data. (Line 90 restores the memory pointer, giving you back all of bank 1 as free memory.) Line 30 loads the custom character set; line 40 reads the short machine language program from the Data statements and puts it at starting address $0200; and line 50 runs the machine language program.

As shown above, you should run the subroutine first in your program as any Basic variables will be lost by the action of lines 20 and 90. If you want to run this initialization routine later in your program, you should set the top of memory (line 20) at the beginning of your program and omit line 90. This means that you will lose



Photo 1. 80-Column Characters screen display.

11K of variable storage in bank 1. To restore the original ROM character set, use SYS65378.

Designing Custom Characters

Type in Listing 1 exactly as it is shown. Do not run it until you have typed in the entire program and saved it to disk. The program changes the C-128's operating system, and your computer may lock up if your program contains errors.

Note also that line 230 redefines the help key to CHR$(8), and lines 235–240 reprogram the function keys. Be especially careful to enter correctly the sequence of characters in lines 245 and 250.

When you run 80-Column Characters, the Help screen appears on the bottom half of the display. It contains all the instructions for using the program, and you may recall it at any time by pressing the help key. The function keys are redefined so that f1 loads a character set file from disk and f3 copies the ROM characters to disk. Since you will have no character set on disk at the beginning, press f3 and create one. Then use f1 to load that character set file.

After you've loaded the character set into RAM, all 512 characters will be printed in eight rows of 64 characters each at the top of the screen. Every two rows of characters represent a set of 128 characters. The first two sets (rows 1–4) are the characters obtained by the command Print CHR$(142); rows 3–4 are printed when you are in Reverse mode (CTRL 9). The last two sets (rows 5–8) are the characters obtained by the command Print CHR$(14).

A blinking cursor appears over the @ character at the top left-hand corner of the screen. To redesign a character, position the cursor over that character and press the return key.

As an alternative to using the cursor keys, you can simply press the key you wish to redesign. Select uppercase or graphics characters by pressing the shift or Commodore key as you make your key selection.

After you select the character you wish to redesign, it will appear in an 8 × 8 yellow box at the top right-hand corner of the screen. Each cell in the box represents one pixel (dot) in the screen character. Yellow cells represent pixel-off, and brown cells represent pixel-on.

You can move the cursor in the character-design box with the cursor keys or the 8, 4, 6 and 2 keys on the numeric keypad. Pressing the plus-sign (+) or period (.) keys turns a pixel on, and pressing the hyphen (-) or zero (0) key or the space bar turns a pixel off. Pressing R causes the character design to be reversed. When you have redesigned the character, press the return or enter key to initialize it; then select another character or a command.

You can test the appearance of your redesigned characters in a Test-Type mode by pressing f7. This allows you to type into the window at the bottom of the screen, and almost all of the usual keyboard commands will work. For example, you can change the character sets by pressing shift-Commodore; print reverse character sets by pressing CTRL-9; change colors; turn on underlining by pressing CTRL-B; clear the screen window; and so on. You exit from this mode by pressing f7.

When you are finished redesigning a character set, press f5 to save your new characters to a disk file. You can later use these characters in the programs you write by using the BLoad command and the initialization subroutine in lines 40–80 to load the character set file into RAM. R

Address all author correspondence to Frederick Goddard, 4828 NW 17th Place, Gainesville, FL 32605.

Listing 1. *80-Col. Characters program.*

```
10 REM *{2 SPACEs}80-COLUMN CUST
   OM CHARACTERS{2 SPACEs}******
   ***{2 SPACEs}BY FRED GODDARD
                          :REM*32
15 FAST                   :REM*53
20 POKE58,DEC("D0"):CLR:GOSUB40:
   GOTO225                :REM*214
40 RESTORE60:FORI=0TODEC("2B"):R
   EADX$:POKEDEC("0200")+I,DEC(X
   $):NEXT                :REM*110
50 BANK15:SYSDEC("0200"):RETURN
                          :REM*34
60 DATA A9,20,8D,A2,02,A9,22,8D,
   A3,02,A9,02,8D,A4,02,20,62,FF
                          :REM*102
70 DATA A9,AD,8D,A2,02,A9,00,8D,
   A3,02,A9,FF,8D,A4,02,60
                          :REM*162
80 DATA A2,01,BD,F0,F7,AA,AD,00,
   FF,60                  :REM*40
100 COLOR5,8:WINDOW68,0,75,7,1:B
    ANK1                  :REM*176
105 FORY=0TO7:FORX=0TO7 :REM*205
110 IFPEEK(V+Z*8+Y)AND2{UP ARROW
    }(7-X)THENPRINT"{COMD 5} ";:
    ELSEPRINT"{CTRL 8} ";:REM*38
115 NEXT:NEXT             :REM*119
120 Y=0:X=0:PRINT"{HOME}";
                          :REM*144
125 IFPEEK(V+Z*8+Y)AND2{UP ARROW
    }(7-X)THENPRINT"{COMD 5}";
                          :REM*173
130 GETKEYK$              :REM*16
135 IF(K$="{CRSR DN}")OR(K$="2")
    THENPRINT"{CRSR DN}";:Y=-(Y+
    1)*(Y<7):GOTO125      :REM*217
140 IF(K$="{CRSR UP}")OR(K$="8")
    THENPRINT"{CRSR UP}";:Y=-(Y-
    1)*(Y>0):GOTO125      :REM*168
145 IF(K$="{CRSR RT}")OR(K$="6")
    THENBEGIN:PRINT"{CRSR RT}";:
    X=-(X+1)*(X<7):IFX=0THENY=-(
    Y+1)*(Y<7)            :REM*233
150 GOTO125:BEND          :REM*56
155 IF(K$="{CRSR LF}")OR(K$="4")
    THENBEGIN:PRINT"{CRSR LF}";:
    IFXTHENX=X-1:GOTO125  :REM*39
160 IFYTHENX=7:Y=Y-1      :REM*198
165 GOTO125:BEND          :REM*71
170 IF(K$=" ")OR(K$="0")OR(K$="-
    ")THENBEGIN:POKEV+Z*8+Y,PEEK
    (V+Z*8+Y)AND(255-2{UP ARROW}
    (7-X))                :REM*210
175 PRINT"{CTRL 8} ";:X=-(X+1)*(
    X<7):IFX=0THENY=-(Y+1)*(Y<7)
                          :REM*239
180 GOTO125:BEND          :REM*86
185 IF(K$=".")OR(K$="+")THENBEGI
    N:POKEV+Z*8+Y,PEEK(V+Z*8+Y)O
    R2{UP ARROW}(7-X)     :REM*35
190 PRINT"{COMD 5} ";:X=-(X+1)*(
    X<7):IFX=0THENY=-(Y+1)*(Y<7)
                          :REM*158
195 GOTO125:BEND          :REM*101
200 IFK$="R"THENFORY=0TO7:POKEV+
    Z*8+Y,XOR(PEEK(V+Z*8+Y),255)
    :NEXT:GOTO105         :REM*58
205 IFK$=CHR$(13)THENGOSUB640:RET
    URN                   :REM*131
210 IFK$=CHR$(8)THENGOSUB635:GOT
    O100                  :REM*240
215 GOTO130               :REM*193
225 ES$=CHR$(27):V=53248:PRINTCH
    R$(14)ES$"R"ES$"M{CTRL 4}{SH
    FT CLR}{2 CRSR DNs}{3 SPACEs
    }{SHFT S}ELECT <{SHFT F}1> O
    R <{SHFT F}3>         :REM*53
230 X=0:POKE4105,1:FORI=4096TO41
    05:X=PEEK(I)+X:NEXT:POKE4105
    +X,8                  :REM*4
235 R=0:C=0:Z=0:KEY1,CHR$(133):K
    EY3,CHR$(134):KEY5,CHR$(135)
    :KEY7,CHR$(136)       :REM*187
240 KEY2,"":KEY4,"":KEY6,"":KEY8
    ,""                   :REM*240
245 A1$="@ABCDEFGHIJKLMNOPQRSTUV
    WXYZ[{LB.}]{UP ARROW}{LEFT A
    RROW} !"+CHR$(34)+"#$%&'()*+
    ,-./0123456789:;<=>?":REM*55
250 A2$="{SHFT *}{SHFT A}{SHFT B
    }{SHFT C}{SHFT D}{SHFT E}{SH
    FT F}{SHFT G}{SHFT H}{SHFT I
    }{SHFT J}{SHFT K}{SHFT L}{SH
    FT M}{SHFT N}{SHFT O}{SHFT P
```

→

A Printer For All Reasons

Search For The Best High Quality Graphic Printer

The Results Are In We ran many printers through our battery of tests and this one came out first in its class. Our SP-1000, built by Seiko is a 100 characters per second, (12 horizontal by 9 vertical matrix), full bi-directional, logic seeking, true descender printer. The character matrix in NLQ (Near Letter Quality) mode is a very dense 24 (horizontal) by 18 (vertical).

Features That Won't Quit With the SP-1000 your computer can now print 40, 48, 68, 80, 96, or 136 characters per line. You can print in scores of style variations. You not only have standard Pica, Elite, Condensed and Italics, but also true Superscripts and Subscripts. Use **bold**, or *italics* to make the words stand out. Or, if you wish to be even more emphatic, underline the words. You can combine many modes and styles to make the variation almost endless.

Forms? Yes! Your Letterhead? Of Course! The tractors are adjustable from 4 to 10 inches. You can also use single sheets, plain typing paper, your letterhead, short memo forms, labels, whatever you choose. Any size to 10" in width. It will even load your paper automatically. Multiple copies? Absolutely! Use forms up to 3 thick. Spread sheets with many columns? Just go to condensed mode printing and print a full 136 columns wide all on a standard 8½" wide page. Forget expensive wide-carriage printers and having to change to wide carriage paper.

An Extra Long Life (2.5 million character) ribbon cartridge is only $11.00. Order #2001. You need absolutely nothing else to start printing—just add paper (single sheet or fanfold tractor).

No Risk Offer We give you a 2-week satisfaction guarantee. If you are not completely satisfied for any reason we will promptly refund your purchase.



The warranty has now been extended to 2 years and service centers are located nationwide for your convenience.

The Bottom Line:

Commodore C-64 & C-128, Order #2200. graphics interface & cable built in. $219.95

IBM-PC and compatibles, Order #2100, $239.95 plus 8' shielded cable #1103, $16.95

Apple IIc or Macintosh, Order #2300, $239.95 with cable, specify computer

Standard Parallel with 36 pin Centronics connector, Order #2400, $239.95 no cable

Standard Serial with RS-232 (DB-25) Connector, Order #2500, $239.95 no cable

Be sure to specify the order # for the correct version printer designed for your computer.

Interfaces and cables for other computers. Call 805/987-2454 for details.

Shipping in cont. US is $10.00. UPS Blue is $22.00.

Letter Perfect

Now! Full Feature, 20 CPS, Letter Quality Printer only $319.95

For those who need a Daisy Wheel Printer, our Daisy 1120 has it all. To start with, it has a front control panel with indicators for Pitch Selection which allows for 10, 12 or 15 pitch or Proportional Space printwheels. There is a Select (Online) button with indicator and a Line Feed button. You can also set Top-of-Form or Form Feed with the touch of a button. Other indicators include Power and Alarm. The built in 2K buffer allows a page or two of concurrent printing and use of your computer for the next job. To really take advantage of your printer's optional features, the automatic Cut Sheet Feeder eliminates tiresome single page handling and the adjustable Tractor Feed option handles all continuous form paper. Best of all the Daisy 1120 is quiet: only 58 dB.



Total Compatibility The Daisy 1120 uses 96 character Diablo® compatible printwheels. At 15 pitch you can print 165 columns—a must for spreadsheets.

The Daisy 1120 uses the Diablo Hytype II® standard ribbon cartridges, also universally available.

Not only is the hardware completely compatible, the control codes recognized by the Daisy 1120 are Diablo 630® compatible (industry standard). You can take advantage of all the great features of your word processing package and automatically use superscripts, subscripts, automatic underlining, boldface and doublestrike.

The printer has a set of rear switches which allow the use of standard ASCII as well as foreign character printwheels. Page length can be set to 8, 11, 12, or 15". The Daisy 1120 can also be switched to add automatic line feed.

Try the Daisy 1120 for 2 weeks. If you are not satisfied we will issue a prompt refund. 1-year parts and labor warranty is included.

The Bottom Line Aprotek Daisy 1120 (Order #1120) $319.95 w/standard Centronics parallel interface, 2K buffer, ribbon and printwheel.

Options: ***Compare our prices!***
Auto Cut Sheet Feeder (#1110) $185. Shipping $7.
Bidirectional Tractor Feed (#1112) $75. Shipping $5.
Interfaces for most computers are available—call.
Shipping in cont. US is $11. UPS Blue is $24.

ORDERING INFORMATION California residents add 6% tax. All prices are cash prices — VISA and MC add 3% to total. We ship the next business day on money orders, cashier's checks, and charge cards. A 14-day clearing period is required for checks. Prices subject to change—CALL. Dealer inquiries invited.

For information call **805/987-2454**
TO ORDER CALL TOLL FREE
1 (800) 962-5800 - USA (8-8 PST)
1 (800) 962-3800 - Calif.

Or send order to:

APROTEK DEPT. RN

1071-A Avenida Acaso, Camarillo, CA 93010

Listing continued.

```
}{SHFT Q}{SHFT R}{SHFT S}{SH
FT T}{SHFT U}{SHFT V}{SHFT W
}{SHFT X}{SHFT Y}{SHFT Z}{SH
FT +}{COMD -}{SHFT -}{PI}{CO
MD *} {COMD K}{COMD I}{COMD
T}{COMD @}{COMD G}{COMD +}{C
OMD M}{COMD LB.}{SHFT LB.}{C
OMD N}{COMD Q}{COMD D}{COMD
Z}{COMD S}{COMD P}{COMD A}{C
OMD E}{COMD R}{COMD W}{COMD
H}{COMD J}{COMD L}{COMD Y}{C
OMD U}{COMD O}{SHFT @}{COMD
F}{COMD C}{COMD X}{COMD V}{C
OMD B}"                    :REM*2ØØ
255 GOSUB67Ø                :REM*97
26Ø GETKEYK$:IFK$>CHR$(132)THENI
FK$<CHR$(135)THEN29Ø:ELSE26Ø
                           :REM*13
27Ø WINDOWØ,Ø,63,7          :REM*141
275 PRINTES$"F{HOME}{CTRL 4}";:I
FRTHENFORI=1TOR:PRINT"{CRSR
DN}";:NEXT                 :REM*46
28Ø PRINTTAB(C);            :REM*197
285 GETKEYK$                :REM*172
29Ø IFK$=CHR$(133)THENGOSUB385:G
OTO27Ø                     :REM*231
295 IFK$=CHR$(134)THENGOSUB43Ø:G
OTO27Ø                     :REM*17Ø
3ØØ IFK$=CHR$(135)THENGOSUB475:G
OTO27Ø                     :REM*187
3Ø5 IFK$=CHR$(136)THEN565:REM*9Ø
31Ø IFK$=CHR$(8)THEN6Ø5 :REM*225
315 IFK$="{CRSR DN}"THENR=-(R+1)
*(R<7):PRINTK$;:GOTO285
                           :REM*182
32Ø IFK$="{CRSR UP}"THENR=-(R-1)
*(R>Ø):PRINTK$;:GOTO285
                           :REM*121
325 IFK$="{CRSR RT}"THENBEGIN:PR
INTK$;:C=-(C+1)*(C<63):IFC=Ø
THENR=R-(R+1)*(R<7)  :REM*54
33Ø GOTO285:BEND            :REM*85
335 IFK$="{CRSR LF}"THENBEGIN:PR
INTK$;:IFCTHENC=C-1:GOTO285
                           :REM*148
34Ø IFRTHENC=63:R=R-1       :REM*47
345 GOTO285:BEND            :REM*1ØØ
35Ø IFK$=CHR$(13)THENZ=C+R*64:GO
SUB1ØØ:GOTO27Ø             :REM*215
355 IF(96AND(ASC(K$)))THENBEGIN:
R=6ANDR                    :REM*26
36Ø C=INSTR(A1$,K$):IFCTHENC=C-1
:GOTO275                   :REM*43
365 C=INSTR(A2$,K$):IFCTHENR=R+1
:C=C-1:GOTO275             :REM*7Ø
37Ø BEND                    :REM*55
375 GOTO285                 :REM*9Ø
385 GOSUB535                :REM*6Ø
39Ø PRINTCHR$(14)ES$"L"ES$"E{SHF
T CLR}{CRSR DN}{SHFT L}OAD {
SHFT C}HARACTER {SHFT S}ET?
({SHFT Y}/{SHFT N})" :REM*25
395 GETKEYK$:IFK$<>"Y"THEN42Ø
                           :REM*96
4ØØ X$="":PRINT"{CRSR DN}{SHFT F
}ILENAME";:INPUTX$:X$=LEFT$(
X$,16):IFX$=""THEN42Ø
                           :REM*227
4Ø5 BLOAD""+X$,B1,P53248:IFDSTHE
N41Ø:ELSE425               :REM*128
41Ø PRINT"{2 CRSR DNs}"DS$:PRINT
"{CRSR DN}{SHFT T}RY AGAIN?
({SHFT Y}/{SHFT N}) :REM*149
415 DCLOSE:GETKEYK$:IFK$="Y"THEN
4ØØ                        :REM*196
42Ø PRINTES$"M{SHFT CLR}":RETURN
                           :REM*81
425 PRINTES$"M{SHFT CLR}":GOSUB4
Ø:GOSUB54Ø:RETURN     :REM*4
43Ø GOSUB535               :REM*1Ø5
435 PRINTCHR$(14)ES$"L"ES$"E{SHF
T CLR}{CRSR DN}{SHFT C}OPY {
CTRL 8}{SHFT R}{SHFT O}{SHFT
M}{COMD 4} CHARACTER SET TO
DISK? ({SHFT Y}/{SHFT N})
                           :REM*186
44Ø GETKEYK$:IFK$<>"Y"THEN47Ø
                           :REM*151
445 X$="":PRINT"{CRSR DN}{SHFT F
}ILENAME";:INPUTX$:X$=LEFT$(
X$,16):IFX$=""THEN47Ø:REM*82
45Ø BSAVE""+X$,B14,P53248TOP5734
4                          :REM*215
455 PRINT"{2 CRSR DNs}"DS$:IFDS=
ØTHEN47Ø                   :REM*222
46Ø DCLOSE:PRINT"{CRSR DN}{SHFT
T}RY AGAIN? ({SHFT Y}/{SHFT
N})                        :REM*83
465 GETKEYK$:IFK$="Y"THEN445
                           :REM*16Ø
47Ø PRINTES$"M{SHFT CLR}":RETURN
                           :REM*131
475 GOSUB535               :REM*15Ø
48Ø PRINTCHR$(14)ES$"L"ES$"E{SHF
T CLR}{CRSR DN}{SHFT S}AVE C
HARACTER SET? ({SHFT Y}/{SHF
T N})                      :REM*2Ø3
485 GETKEYK$:IFK$<>"Y"THEN525
                           :REM*2Ø8
49Ø X$="":PRINT"{CRSR DN}{SHFT F
}ILENAME";:INPUTX$:X$=LEFT$(
X$,16):IFX$=""THEN525
                           :REM*223
495 BSAVE""+X$,B1,P53248TOP57344
:IFDS<>63THEN51Ø     :REM*112
5ØØ PRINT"{2 CRSR DNs}"DS$"{4 SP
ACEs}{SHFT R}EPLACE? ({SHFT
Y}/{SHFT N})":DCLOSE:GETKEYK
$:IFK$<>"Y"THEN525   :REM*39
5Ø5 BSAVE"@"+X$,B1,P53248TOP5734
4                          :REM*252
51Ø PRINT"{2 CRSR DNs}"DS$:IFDS=
ØTHENSLEEP1:GOTO525 :REM*119
515 DCLOSE:PRINT"{CRSR DN}{SHFT
T}RY AGAIN? ({SHFT Y}/{SHFT
N})                        :REM*139
52Ø GETKEYK$:IFK$="Y"THEN48Ø
                           :REM*21Ø
525 PRINTES$"M{SHFT CLR}":GOSUB4
Ø:RETURN                   :REM*211
535 BANK15:SYS65378:COLOR5,12:WI
NDOWØ,9,79,24,1:RETURN:REM*5
54Ø COLOR5,8:WINDOW68,Ø,75,7,1:C
OLOR5,4:WINDOWØ,Ø,65,7,1
                           :REM*228
545 PRINTCHR$(142)A1$:PRINTA2$:P
RINT"{CTRL 9}"A1$:PRINT"{CTR
L 9}"A2$                   :REM*2Ø5
55Ø PRINTCHR$(14)A1$:PRINTA2$:PR
INT"{CTRL 9}"A1$:PRINT"{CTRL
9}"A2$                     :REM*24
555 R=Ø:C=Ø:WINDOWØ,Ø,63,7:RETUR
N                          :REM*27
565 PRINTES$"F{COMD 4}";:WINDOWØ
,9,79,24,1:REM TEST-TYPING M
ODE                        :REM*153
57Ø GETKEYK$                :REM*2Ø2
575 IFK$=CHR$(136)THEN27Ø
                           :REM*199
58Ø IFK$=CHR$(8)THEN65Ø :REM*16Ø
585 IFK$=CHR$(34)THENK$=K$+ES$+"
O"                         :REM*141
59Ø IFK$="{HOME}"THENK$=K$+"{CRS
R RT}{CRSR LF}"            :REM*3Ø
595 PRINTK$;:GOTO57Ø        :REM*117
6Ø5 GOSUB535:GOSUB685       :REM*231
61Ø PRINT"{CTRL 4}{SHFT P}RESS F
UNCTION KEY TO SELECT COMMAN
D OR <{SHFT R}ETURN> TO END
{SHFT H}{SHFT E}{SHFT L}{SHF
T P}.";                    :REM*222
615 PRINTES$"E";            :REM*117
62Ø GETKEYK$:IFK$=CHR$(13)THENGO
SUB4Ø:GOTO27Ø              :REM*56
625 IFK$>CHR$(132)THENIFK$<CHR$(
137)THEN29Ø                :REM*253
63Ø GOTO62Ø                 :REM*122
635 GOSUB67Ø                :REM*223
64Ø GETKEYK$:IFK$<>CHR$(13)THEN6
4Ø                         :REM*18Ø
645 GOSUB4Ø:PRINTES$"F":RETURN
                           :REM*23
65Ø GOSUB535:GOSUB67Ø       :REM*254
655 GETKEYK$:IFK$=CHR$(136)THEN5
75                         :REM*251
66Ø IFK$=CHR$(13)THENGOSUB4Ø:PRI
NTES$"F{COMD 4}{SHFT CLR}";:
GOTO57Ø                    :REM*254
665 GOTO655                 :REM*1Ø9
67Ø GOSUB535:GOSUB685       :REM*4Ø
675 PRINT"{SHFT E}XIT {SHFT T}ES
T-{SHFT T}YPE WITH <{SHFT F}
7>.{7 SPACEs}{CTRL 4}{SHFT P
}RESS <{SHFT R}ETURN> TO END
{SHFT H}{SHFT E}{SHFT L}{SH
FT P}.";                   :REM*137
68Ø PRINTES$"E";:RETURN     :REM*18
685 PRINTCHR$(14)"{SHFT H}ELP {S
HFT S}CREEN--{SHFT V}IEW {SH
FT H}ELP SCREEN AT ANY TIME
BY HITTING THE <{SHFT H}{SHF
T E}{SHFT L}{SHFT P}> KEY ON
TOP ROW.                   :REM*47
69Ø PRINT"{SHFT H}IT FUNCTION KE
Y TO SELECT COMMAND::REM*132
695 PRINT"{4 SPACEs}<{SHFT F}1>
{SHFT L}OAD CHARACTER SETS F
ROM DISK{3 SPACEs}<{SHFT F}3
> {SHFT C}OPY {SHFT R}{SHFT
O}{SHFT M} CHARACTER SET TO
DISK                       :REM*9
7ØØ PRINT"{4 SPACEs}<{SHFT F}5>
{SHFT S}AVE CHARACTER SETS T
O DISK{5 SPACEs}<{SHFT F}7>
{SHFT E}NTER/{SHFT E}XIT {SH
FT T}EST-{SHFT T}YPING {SHFT
M}ODE                      :REM*16
7Ø5 PRINT"{3 SPACEs}{SHFT F}OUR
CHARACTER SETS WILL BE DISPL
AYED AT THE TOP OF THE SCREE
N IN EIGHT ROWS.    :REM*229
71Ø PRINT"{SHFT T}O SELECT CHARA
CTER TO BE REDESIGNED, MOVE
CURSOR UP/DOWN TO SELECT CHA
RACTER                     :REM*222
715 PRINT"SET, THEN EITHER MOVE
CURSOR TO CHARACTER DESIRED
OR PRESS KEY CORRESPONDING T
O                          :REM*159
72Ø PRINT"THE CHARACTER DESIRED
(USE SHIFT OR LOGO KEYS IF A
PPROPRIATE).{2 SPACEs}{SHFT
W}HEN CURSOR IS            :REM*7Ø
725 PRINT"OVER DESIRED CHARACTER
, HIT <RETURN> TO ENTER DESI
GN MODE.                   :REM*227
73Ø PRINT"{3 SPACEs}{SHFT I}N DE
SIGN MODE THE CHARACTER IS D
ISPLAYED IN YELLOW BOX AS EI
GHT COLUMNS AND            :REM*6Ø
735 PRINT"ROWS.{2 SPACEs}{SHFT U
}SE CURSOR KEYS OR NUMERIC P
AD (8,4,6,2 FOR UP,LF,RT,DN)
TO MOVE CURSOR.            :REM*51
74Ø PRINT"{SHFT U}SE {CTRL 4}+{C
OMD 4} OR {CTRL 4}.{COMD 4}
KEYS TO FILL A CELL, {CTRL 4
}{SHFT S}PACE{COMD 4}, {CTRL
4}-{COMD 4} OR {CTRL 4}Ø{CO
MD 4} TO BLANK A CELL, AND {
CTRL 4}{SHFT R}{COMD 4} TO R
EVERSE                     :REM*194
745 PRINT"THE CHARACTER.{2 SPACE
s}{SHFT W}HEN THE DESIGN IS
COMPLETE, HIT <RETURN> TO FI
X THE DESIGN AND           :REM*229
75Ø PRINT"RETURN TO THE MAIN MOD
E.                         :REM*1Ø6
755 PRINT"{3 SPACEs}{SHFT I}N {S
HFT T}EST-{SHFT T}YPING MODE
, YOU CAN USE THE KEYBOARD T
O TEST THE APPEARANCE OF YOU
R                          :REM*179
76Ø PRINT"NEW CHARACTER SET.{2 S
PACEs}";:RETURN            :REM*166
```

JUST IN TIME FOR SUMMER! GREAT PRICES!

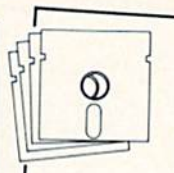
CSP

Computer Supplies of Peterborough

CURTIS SURGE PROTECTORS



	LIST	SALE
Diamond	$49.95	$39.95
Emerald	$59.95	$49.95
Sapphire	$79.95	$69.95
Ruby	$89.95	$79.95

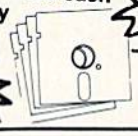


FAMOUS BRAND $ DOLLAR $ DISKS!

- Quality Nationally Known Brand 5¼" disks
- Reliable, lifetime warranty
- SS/DD only $1.00 each
- DS/DD only $1.15 each
- Any quantity

BULK VALUE

GREAT SAVINGS





CURTIS SAFE-STRIP

Super Value! Priced at only $19.95

List $29.95

Protect Valuable electronic equipment and data files from damage. Surge and spike suppressor and noise combination converts one outlet into six.

NEW!



Tilt and Swivel Power Center

ONLY $79.95

SURGE PROTECTOR
NOISE EMI/FILTER

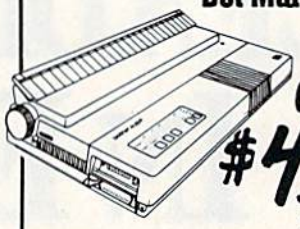
- 15A Circuit Breaker
- 6FT Cord 14/3 AWG SJT
- 15A, 125V, 60Hz, 1800W
- Master Power On/Off Switch
- Lighted Rocker Switches Correspond to Five Individual Sockets on Rear Panel
- High Grade Against Fire ABS Construction.
- Can Swivel & Tilts
- 11" x 10" x .75"

FAN FOLD COMPUTER PAPER



	LIST	SALE
20# 1000 Sheets micro-perfed	$19.95	$14.95
20# 2500 Sheets micro-perfed	$32.95	$26.95
15# Green bar 3500 Sheets	$47.95	$37.95

Brother M-1509 Serial Impact Dot Matrix Printer



ONLY $425.00

List $550.00

- High speed output (180 cps)
- Near Letter Quality printing
- Variety of printing fonts and functions
- Large buffer memory
- Optional auto cut sheet feeder
- Compatible with IBM PC® and Epson FX-100+®
- One inch paper cut function
- Slim, compact, and attractively styled
- Quiet Operation

LOOK! ONLY $8.57

VIC-20 SAVINGS!!

Don't MISS OUT on these INCREDIBLE savings on VIC-20 Software! All products listed below can be yours for only $8.57 per item*. !!!FIRST COME FIRST SERVED—LIMITED QUANTITIES—ORDER NOW!!!

Practicalc (C)	The Cube Game (C)	Fly Snatcher (C)
Cubic (C)	Backgammon	Qubic (C)
Voodo Castle (C)	(C)Snackman (C)	Barrel Jumper (C)
Math Duel (C)	Johnny Jumpet (C)	SWARM (C)
Bio Rhythm (C)	Tiny Tutor (C)	Super Alien (C)
Tank Wars (C)	Flower Power (C)	CSADD Disassembler (C)
Sub Command (C)	Sprint Typer (C)	HI-Res Graphics (C)
Radar Rat Race	Rabbit Base (C)	Aggressor (C)
Mole Attack (cart)	VIC REVEALED (BOOK)	The Gambler (C)
Alien Blitz (C)	Galactic Blitz (C)	The Carpooler (C)
Road Test (C)	Spiders of Mars (C)	Coupon Manager (C)
Reversal (C)	Pac Bomber (C)	
Composer (C)	Apple Panic (C)	
Black Jack (C)	Super Slither (C)	
Grimms Fairy Tales (C)	Gortek & Micro Chips (D)	
Outworld (C)	Stealth (C)	

Great Selection

Protect Your Software FLIP 'N' FILE/15

Protect Software from dust, debris and moisture. Stores up to 15 5¼" diskettes.

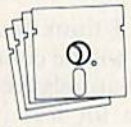


List Price $9.95

Sale $7.95

Also Available	LIST	SALE
Teak Roll Tops 5¼-50	$32.95	$18.95
Teak Roll Tops 3½-45	$23.95	$16.95
Teak Rolltop/100	$48.95	$34.95
Flip 'n' File/50	$19.95	$14.95
Flip 'n' File/15	$ 9.95	$ 7.95
Teak Roll Top/100	$49.95	$39.95

GREAT VALUES!



Software

	List	Sale
Inventory Control	34.95	24.95
Commodore 64 Basic	14.95	7.95
Archon	40.00	24.95
Paper Clip	89.95	54.95
Bankstreet Musicwriter	49.95	29.95
Indiana Jones	29.95	19.95
Super Disk Utility	22.95	12.95
Farneheit 451	32.95	19.95
Mail Controller	49.95	24.95
Movie Maker	60.00	26.95
Golden Oldies	32.95	27.95
Auto Duel	49.95	37.95
Racing Destruction set	32.95	26.95
Sky Fox	34.95	29.95
Wishbringer	34.95	24.95
Flight Simulator II	49.95	34.95
Graphics Library 1,2,3	24.95	19.00
Practicalc (C)	49.95	8.95
Fast Load (rom)	39.95	25.95
Rainbow Quest (D&C)	19.95	9.95
Sargon III	39.95	33.95
Amazon	39.95	23.00
C-64 Graphics and Sound	12.95	11.95
Anatomy of the Commodore	19.95	14.95
Adventure Construction Set	40.00	29.95
Dr. J and Larry Bird	32.95	24.95
Sea Stalker	39.95	29.95
Chartpak 64	42.95	25.95
Stock Analyzer	54.50	41.95
Cut and Paste	45.45	39.95
C-64 Programmer's Reference Guide	19.95	9.95



BUY NOW!

ORDER TOLL FREE 800-843-6700

QUESTIONS? Call 603-924-9261 Ext. 133

Hours: M-F 8:00-5:00 EST

$3.00 Postage & Handling. Quantities Limited. Selection may vary. All sales final. Returns need RMA. Allow 2-6 weeks for delivery. We reserve the right to substitute similar items.

MC VISA Money Order

Gee Whiz!

Printer Interface w/buffer! CAROCO G-Whiz interface. Price + performance no other printer interface can touch!

List $69.95 **Best price only $48.95**

LOOK AT THESE GREAT PRICES & TITLES!!!!!

	List	Our Low Price
Gato	$29.95	$21.95
Jet	$39.95	$31.95
Silent Service	$34.95	$24.95
F-15 Strike Eagle	$34.95	$22.95
Math Blaster	$49.95	$31.95
Print Shop	$44.95	$28.95
World's Great Baseball	$34.95	$24.95
Newsroom	$49.95	$34.95

GROLIER— LEADING THE WAY IN EDUCATION

An interview with Kathleen Hurley, vice-president of Grolier Electronic Publishing.

By MARGARET MORABITO

Kathleen Hurley joined Grolier Electronic Publishing in April 1984 to set up its microcomputer software department.

Ms. Hurley has extensive experience in the field of educational software, having worked with companies such as Intentional Educations, Talmis, Developmental Learning Materials (DLM) and, now, Grolier. She has a master's degree in special education and was formerly a learning disabilities teacher.

Grolier is well-known for its encyclopedias and for providing on-line access to them through several major information networks. It is also a leader in educational software development for microcomputers, including the C-64 and C-128.

The first part of this interview deals with the education market for microcomputers and Grolier's participation in this area. The second part moves into a discussion of the C-64 and the C-128 in the field of education.

RUN: What does the educational market for microcomputers look like now? Is it growing or on the decline?
KH: I think the market for computer systems is on the decline because the schools are really at a crossroads. They're looking at larger systems and, I think, trying to decide where they want to go in the future. But they are buying lots of software, and they're buying peripherals such as modems and printers. They're getting into CD-ROMs, video disks... that kind of thing.

RUN: In your view, is the home computer market dead?
KH: It's not really dead, but neither is it very alive. It's kind of in a slump.

Educational software still has a big market in the home, but there is some confusion on the part of the parents. Parents don't even know how to teach their kids to read in traditional ways. When you bring in software, it becomes even more confusing. I think there is a market and it will continue to grow, but I don't think it's really that big yet. Eventually, I think the home and school markets will be connected.

The marketing channels are changing, too. There's a lot less retail. I don't think people are running into their corner software store to buy software. But, parents are buying through catalogs that come to the home, and they see products on TV. They are buying software, but they're not buying through the channels software people expected.

RUN: Does Grolier distinguish between the home education market and the school market in its software design and marketing?
KH: Yes. We have a home package that is $10 less than the school package. The home package just has one disk and a guide for parents. The school package has two disks and a teacher's guide. We also have lab packs for schools; these consist of six disks and a teacher's guide. All the products we sell are either home/retail packages, school packages or lab packs.

And our marketing is a little dif-

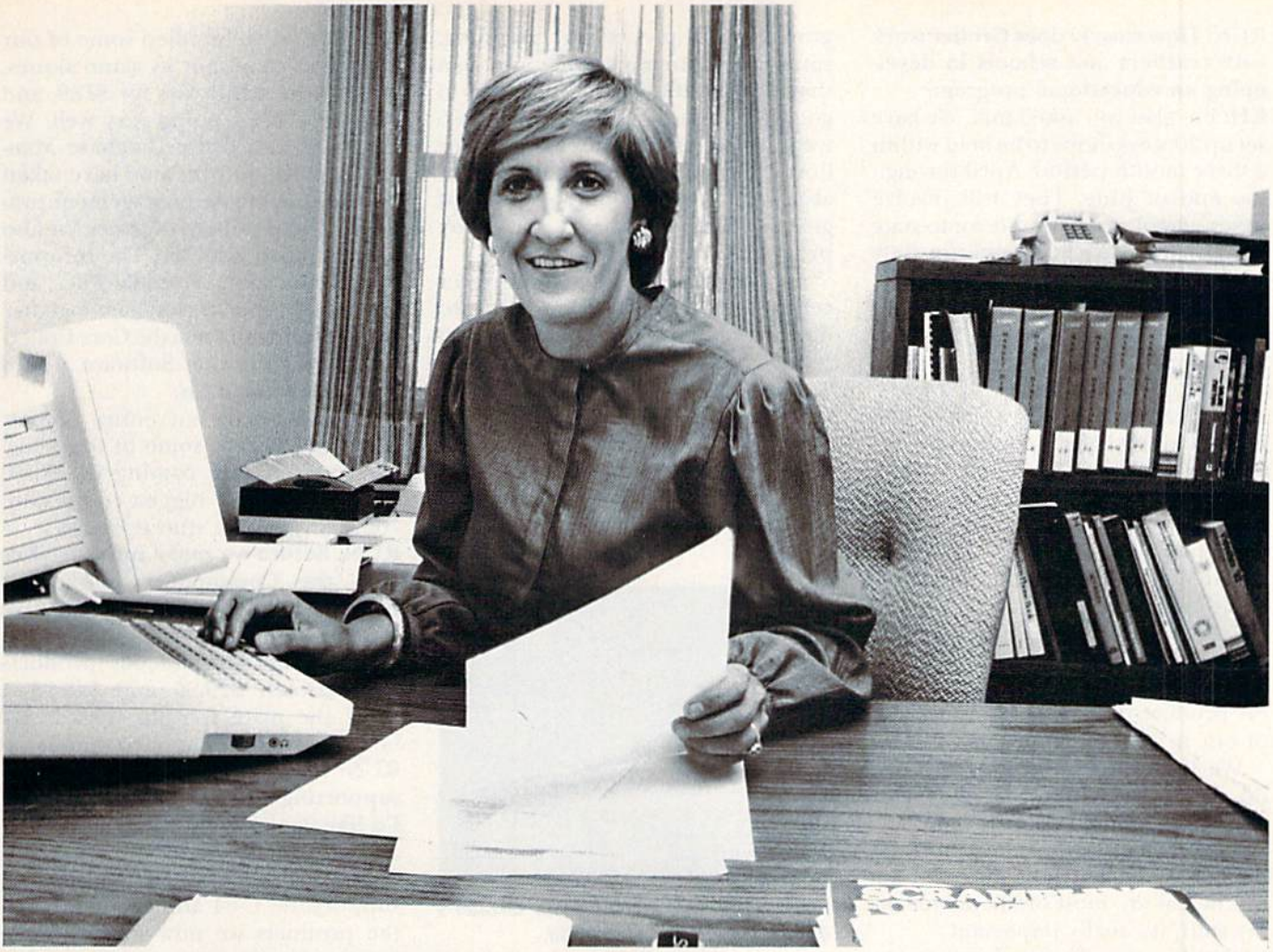


Photo 1. Kathleen Hurley, vice-president of Grolier Electronic Publishing.

ferent. We put out a catalog that goes into the schools, and we do telemarketing. As far as the homes are concerned, we use more advertising, dealers and representatives. But the school market is our bigger market. We believe the school market will eventually have a decisive influence on the home software market.

RUN: What are the major differences between educational software for the home and that made for the schools?

KH: What we try to do (even with our advertising) is tie the software more into the curriculum. We try to show the teachers how our tools can be tied into social studies, reading, etc. In our teacher guides, we try to have lesson plans, black-line masters—more support materials that the teacher can use. The home packages just aren't as comprehensive. Of course, they aren't as expensive, either.

We're doing something called a Curriculum Guide that we're going to be giving away to schools that purchase 75 dollars' worth of our software. The guide provides detailed lesson plans for our major products across the curriculum: language arts, math, reading, social studies, science, and then into special ed and libraries. I think that's what teachers are looking for—how the products are tied into their schools. The guide will be available at the end of March, and we're really excited about it.

RUN: What problems do software manufacturers such as Grolier encounter when dealing with the educational market?

KH: Lots. One is making sure that we've upgraded our software to match the machines. The hardware keeps changing. And then there's the whole idea of networking and site licensing. Schools are getting more adamant in their desire to buy unprotected copies and to make numerous copies.

There's also the high cost of previewing, which is something the schools want to do. They want to take the product for 30 days and then return it if they don't like it. The publishers have a hard time with that.

RUN: How has Grolier gone about solving these problems?

KH: First of all, we're one of the first companies to really bite the bullet and come out with a policy on site licensing. The policy says that if you want to buy so many of our products and use them in so many schools, we have a price set on how much it's going to be for each of those products.

RUN: Do you foresee that other software companies will follow suit?

KH: Oh yes. I'm Chairperson of the Education Committee of the Software Publisher's Association, and these are the issues we're discussing.

RUN: Will this site licensing take care of schools that want to use the software for networking?

KH: Yes. We are currently testing our software on all major network systems to determine compatibility. But our new policy does embrace both site licensing and networking.

RUN: How closely does Grolier work with teachers and schools in developing an educational program?

KH: I'm glad you asked that. We have set up 20 workshops to be held within a three-month period: April through the end of June. They will involve large school districts and some state departments. We'll discuss not only software but CD-ROM, video disk and on-line technology.

We're going to try to show teachers and administrators how all of these technologies fit together. We're providing teacher training, which I think is becoming critically important, especially as we get into some of these new technologies. And, we're working closely with Commodore and Apple on those projects.

RUN: Will you be getting feedback from teachers?

KH: We're definitely going to use this as an opportunity to get feedback. We've got a questionnaire planned on product development and some of our marketing strategies.

We always work with teachers. We do a lot of telephone surveys and exhibits at the district and state levels. We're talking with teachers all the time. Given that I'm an ex-teacher, as are most of the people on my staff, it's really important.

RUN: Do you have programmers who are teachers?

KH: We work with software development houses, as opposed to having in-house programmers. All these development houses have teachers working on the projects. And of course all our documentation is written by teachers. Our Curriculum Guide was written by six teachers in the different content areas.

RUN: How do you determine the need for a specific program?

KH: We do a lot of telemarketing surveys. We talk to people—mostly teachers and administrators—on the phone. We have focus groups, such as we're having at the workshop meetings. We are in very close contact with the state microcomputer coordinators trying to find out what's going on. We do a lot of exhibits where we don't just send in a representative; I'll go myself, or our director of marketing, Howard Zack, will go. We really make an effort to talk to teachers.

RUN: What kinds of software and computer applications do teachers want to see developed for schools?

KH: They are still very interested in tools—database management programs, word processing, graphing, spreadsheet programs. But more than that, they want the print materials to go with these programs. They also want lesson plans. They want to see how the products can be used. They also want teacher tools—tools that generate tests, worksheets, gradebook programs, and such.

Also, any software that a producer comes out with should be tied into the curriculum so that teachers can see with what grade level they should be using this. They want to see some kind of continuity.

And problem solving is a big area. Problem solving across the curriculum. Teachers are interested in software that lets you make decisions while you're working on the screen.



Photo 2. Screen display from Grolier's The Information Connection.

The printer, too, has become really big in the classroom. You'll see more programs like Newsroom and Print Shop, for example. And we have a new program called The Information Connection, which uses a modem for teaching telecommunications. I do believe that there are a lot of things like that.

Another program we released—one that really came directly out of a focus group—was a program that we call Play Together, Learn Together. Teachers and parents can learn to use the computer together with young children. It's for three- to five-year-old kids and is really a fun program. For example, as the parents and kids are learning how they use colors on a computer, they can go outside and try to find a flower or a rainbow with those colors, then talk about colors further. It ties the computer into their everyday life. It's a unique approach to teaching computer literacy.

RUN: Does Grolier handle courseware for schools?

KH: Yes, we've bundled some of our tools that came out as stand-alones. We put them into kits for $189, and they have been doing very well. We have one called the Database Management Kit, in which we have taken all of our database management programs and put them together. We also have bundled EduCalc, The Information Connection, Friendly Filer and EasyGraph; and we put them together for $189 and call them the Core Collection, or Application Software. That's been real good for us.

Teachers want an entire course. And that's where some of these bigger networks are coming in. You'll see some of the bigger courseware companies going into this area.

RUN: Before we move into specifics with the Commodore market, is there anything that you would like to add?

KH: Pricing. Most of our products fall between $29.95 and $49.95. I think the price is right. This is for both home and school programs.

RUN: What are your future plans for supporting Commodore computers. I'd like you to address both the C-64 and the C-128.

KH: We are going to continue to support the C-64 and the C-128. All the products we now have out are for the Commodore machines. We have some new products coming out, too. We have a new word processor that we'll be announcing in September. Then we have a program called The Works, which contains every major computer application on one disk—keyboarding, word processing, database management, music, graphics, manipulating data, problem-solving and more.

We work very closely with Commodore and want to continue that relationship. All of our programs run on both Apple and Commodore, and about half of them work on IBM.

RUN: Anything specifically coming out for the C-128?

KH: We are in the process of enhancing a C-64 program, The Information Connection, for the 128. And then our word processor will be enhanced for the 128, also.

I think the 128 is a great machine. You get three computers in one: the 64, the 128, and then CP/M. I think *USA Today* said that it was the best computer for under $500. You get a good machine at a low cost.

The nice thing Commodore did when developing the 128 was to make

sure that all the 64 software ran on the 128. That way you still had some time to see where the 128 was going and what they were doing with it, and your software was still able to run on it. That was good thinking as far as third-party publishers were concerned. So, these publishers didn't have to design new software right away. People are still watching how it is selling.

RUN: So, you'd say that they are taking a cautious approach?

KH: I think publishers are taking a cautious approach when it comes to the C-128. I'm not sure what Commodore's plans are. I think the C-128 is certainly a low-cost alternative to some of the other machines. But I don't see Commodore making major inroads in the education area as yet. So a lot is going to depend on watching how they market it.

RUN: From your contact with teachers and end users, have you seen much interest expressed in the 128?

KH: Well, I've seen interest, but Commodore has a lot of ground to make up. Apple has a huge educational marketing department, as does IBM, but Commodore really doesn't. They have only one or two people, and, although they're excellent people, their competition just has so many more.

In this business, you've got to do a lot of hand-holding. It's who you know; it's going in and talking to a lot of people and being at all the meetings. And if you don't have a big staff, you can't do that.

RUN: In your opinion, what is Commodore's major weakness when it comes to the school market?

KH: Commodore is weak in that it isn't investing enough in its educational marketing. The company is strong in that it has a good-priced product with a lot of performance.

RUN: How closely are you working with Commodore? Are you involved in any joint projects?

KH: We do a lot of work with Commodore. We usually show our products at the company's booths. Commodore sometimes puts out flyers for us. We show Commodore's machines in our catalog. You know, back and forth. We do a lot of work together.

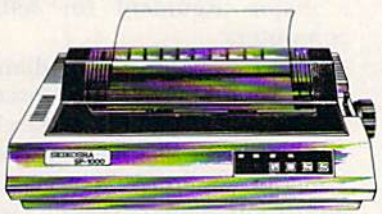
We do co-hospitalities together. We just did one at the American School Administrators (ASA) meeting. Commodore sends us machines for every meeting we attend. If we want to show a 128 with our software, they send us one to use. And that's good. And we share state department information back and forth, and that's helpful.

We are also working with Commodore on the Young Astronaut Program. We just met with Dan Kuntz, the Young Astronaut's launch director, out at ASA, and we're talking about doing something on-line with our encyclopedias in connection with them. We have a lot of projects that we're discussing; we have nothing that we've really announced yet, but there are a lot of possibilities. R

Address all author correspondence to Margaret Morabito, RUN *editorial, 80 Pine St., Peterborough, NH 03458.*

Circle 97 on Reader Service card.

SEIKOSHA



THE SP-1000 SERIES
UNCOMPROMISED QUALITY
AT AN AFFORDABLE PRICE.

The SP-1000 Personal Printer is lightweight, durable and offers 100 cps draft/20 cps near-letter quality. Features also include: dot addressable graphics, adjustable tractor and friction feed, automatic paper loading, long-lasting special cassette ribbon and a variety of fonts. Optional cut sheet feeder available. Full two year warranty.

DIRECT CONNECT COMMODORE
$189.00

PRINTERS

STAR MICRONICS		PANASONIC	
NX10	CALL	KX-P1080	209.00
SG-15	369.00	KX-P1091	231.95
SD-10	321.95	KX-P1092	369.00
SD-15	441.00	KX-P1592	Call
SR-10	469.00	KX-P1595	Call
SR-15	582.00	KX-P3131	259.95
SB-10	565.00	KX-P3151	425.00
Powertype	299.95	CITIZEN	
LEGEND		120D	189.95
808	154.95	MSP10	259.00
1080	205.95	MSP15	359.95
1380	259.95	MSP20	335.95
1385	295.00	MSP25	499.95
OKIDATA		EPSON	
Okimate 10	170.95	Call for current pricing on all Epson models	
Okimate 20	210.00	PRINTER RIBBONS AND DUST COVERS AVAILABLE	
182	219.95		
192	349.95		

MODEMS

Team Modem	199.00
Mitey Mo	59.95
Messenger	46.95
Volks 6470	159.95

COMMODORE

C-128	275.95
C-1571	249.95
C-1670	169.95
Enhancer 2000	179.95

SOFTWARE

Homepak	31.95
Paperclip	36.95
Karateka	18.95
Print Shop	27.95
Companion	CALL
F-15 Strike Eagle	20.50
Silent Service	21.95
Flight Simulator II	31.95
Scenery Disks	CALL
Jet	24.95
Star League Baseball	16.95
Micro-League Baseball	24.95
Fastload	24.95
Multiplan	43.95
B.I. 80 Column	69.95

INTERFACES

PPI	39.95
Super G	59.95
MW350	56.95
G-WIZ	48.95
Micro Stuffer	69.95

MONITORS

TEKNIKA

MJ-10	189.95
MJ-22	254.95

AMDEK

Color 600	289.95
Color 700	469.00
Color 710	539.00

SAKATA

SC-100	159.00

THOMSON

CM365 RGB/Color Composite	269.00
CM366 Color Composite	149.95
36-632 Composite Green w/speaker	79.95
Composite Amber w/speaker	84.95



Indus GT	198.00
Precision (DYSAN) SS/DD	8.50
DS/DD	12.50
5 Boxes Precision Disks with Flip-N-File 50 SS/DD	47.95
DS/DD	59.95
Disk Notchers	3.99
MW350 14K Interface	54.95
Xetec Super	64.95
2500 Sheets Lazor Paper	24.95
Messenger Modem	46.95
Mitey Mo	56.95
Thomson Color Composite with Green Screen (2 yr. war.)	175.95
Home Accountant	27.95
Print Shop & Graphics Library I, II, & III	73.95
Graphics Libraries	15.95

ORDER TOLL FREE 1-800-351-3442
CUSTOMER SERVICE AND PA RESIDENTS CALL 1-717-322-7700

Place orders Mon-Fri 9am-7pm. Customer service calls taken Mon-Fri 10am-4pm. No deposit on C.O.D. orders. Free freight on all prepaid cash orders over $300 in the continental U.S.A. APO & FPO orders add $5 per hundred. Priority mail add $10 per hundred. All foreign orders add 8% for shipping. UPS shipping add $4 per hundred East Coast, $5 per hundred West Coast. PA residents add 6% sales tax. Free shipping for PA residents. Orders by company and personal checks held 3 weeks. Defective products require prior return authorization. Defective products will be replaced or repaired according to warranty. **No used or reconditioned products sold.** Prices and availability are subject to change without notice.

"Where Prices are Born, Not Raised."

WHITE HOUSE COMPUTER
P.O. Box 4025
Williamsport, PA
17701

VISA 4%, MASTER CARD 4%, AMERICAN EXPRESS 5%

Education in Canada—A Favorable Climate For Commodores

Here's a look at what our northern neighbors have been doing with Commodore computers in their schools.

By GAIL HOOK

"In spite of difficult price and tariff questions, Canada has been very active in the microcomputer community," states expert Jim Butterfield. Much of this activity has centered in schools. The recent Pepperwood Report credits Commodore with 67% of the Canadian education market, ranging from 26% in Alberta to a whopping 87% in Ontario. As Doug Mortimer, national education manager for Commodore Canada, notes, "The market has eroded slightly, but we still have well over 50%."

Commodore Canada must have done a lot of things right. Its best move may have been to recognize and take advantage of the hotbed of enthusiasm and expertise that sprang up in Toronto as microcomputers came on the market.

Frank Winter, then a teacher at Sheridan College, Oakville (west of metropolitan Toronto), was one of the first to see the potential of computers in education. At the Boston Computer Show in August 1977, Winter ordered two PET computers, prepaid in U.S. funds. Four months later, the machines were delivered to Sheridan College.

Winter remembers, "I had to convince the college vice-president that these machines could teach. My tools were a two-page manual and two programs—one of them blackjack." Sheridan students wrote 116 drills and tests called Micromath. These programs ran on the PETs instead of on rented mainframe terminals. "Within two years, what we had saved on software rental fees paid for 25 more PETs," recalls Winter.

This was a dynamic period, during which in-house workshops became increasingly popular. Before long, Sheridan College was being invited to present microcomputer conferences all over North America, and Commodore equipment was the star attraction. "It was an exciting time," Winter chuckles. "People in the audience would jump to their feet shouting, 'I've done that!' and run up to the front to demonstrate. I believe those workshops generated a lot of computer sales."

At the same time, the Toronto Pet Users' Group (TPUG) was being organized by Lyman Duggan. Its membership list read like a Who's Who of the first Commodore experts: Jim Butterfield, Steve Punter (Wordpro), Brad Templeton (Power/Pal). Butterfield remembers, "Commodore cast a wary eye on us at first, because, traditionally, users' groups had been for complaints."

The company became enthusiastic, however, when TPUG members began producing the thousands of public domain programs now available throughout much of the world. Commodore Canada supported TPUG with equipment and speakers for meetings, and, in return, the TPUG library provided the company with a major argument for selling its computers.

The burgeoning Canadian grassroots movement joined forces with Commodore Canada in March 1982, when Jim Dionne, vice president of sales, hired Frank Winter to cover education. The Three-for-Two Project, where a school bought three microcomputers for the price of two, was already successfully underway. As the third computer was virtually a donation, Commodore actually gave away 15 to 20 million dollars' worth of equipment in this way.

With the advent of the VIC-20 in November 1981, Commodore began mass-merchandising. Schools were pleased to acquire inexpensive student workstations, and some colleges bought VICs as keyboards for business training.

Consumers rushed to take home the latest high-tech toy. Those at Commodore Canada, however, worried that many had bought on impulse, with no idea of how to use a microcomputer. VICs were in danger of becoming high-tech closet stuffers.

The VIC Project addressed this concern, and, at the same time, sup-

plied thousands of VICs to schools. Educational institutions were offered as many as 40 VIC-20s each at a mere 11% of the original list price. Schools could use them during the day with the understanding that they be available to the general public during evening classes. About 150 centers were set up across Canada.

At this time, hardware was evolving rapidly; numerous small changes made it difficult to transfer programs from machine to machine. In response to customer frustration, Dionne and Winter instituted the Ontario Software Project.

Consultants, teachers and people from the Ontario Ministry of Education worked together to collect public domain software. Student programmers rewrote programs to a standardized format that included student and teacher instructions. The 1200 programs were then classified by subject and grade level and indexed for easy use.

In September 1982, 8000 disks were distributed to 30 school boards that had contributed programs. Each board was encouraged to make copies for its teachers. Some programs were excellent, ready to be included in lessons; others were less polished. But all were starting points, available for teachers to adapt to their own purposes.

By this time, many Canadian educators had been convinced of the worth of computers in education. They were particularly eager to do word processing, but computers with enough memory for this task were still expensive. Then, in September 1982, the Commodore 64 arrived to supply that memory economically—and with the lure of special music and graphics capabilities thrown in. Today, as much as 90% of microcomputer use in elementary and secondary schools is for word processing.

The C-64's Canadian debut was not auspicious. Frank Winter recalls, "I took home the first and only C-64 in Canada. In my ignorance, I stuck a digital-to-analog converter into the back and blew it up. As I was wondering how I was going to tell everyone I had fried our only C-64, I discovered I had just blown a fuse."

Once the shock wore off, the education staff began promoting the C-64s. Each year, salespeople were given an intensive training course, then sent, along with three or four computers and some software, to visit every major school board in Canada. The teachers were given the opportunity to try the computers and programs for two weeks. "You can talk all you want, but there's nothing like giving people the chance to do things themselves," says Winter.

This down-to-earth approach can be credited with much of Commodore Canada's success in the field of education. Winter and district representatives Gord McOrmand, Laurie Fountain and Yvon Husereau all were educators before joining Commodore Canada. Winter believes this gave them a great advantage because "teachers were confident that we knew what we were talking about."

After-sales support is a big selling point, too. During the early years, a quarterly newsletter providing education news and updates on equipment and prices was sent to all Canadian schools. Under Doug Mortimer, Commodore Canada continues to provide speakers and guest experts such as Jim Butterfield for education conferences across Canada.

The company has also recently become involved in Young Astronauts (Canada), a club that promotes science, math and technology skills. Commodore Canada will help the club purchase equipment and will distribute the programs it produces.

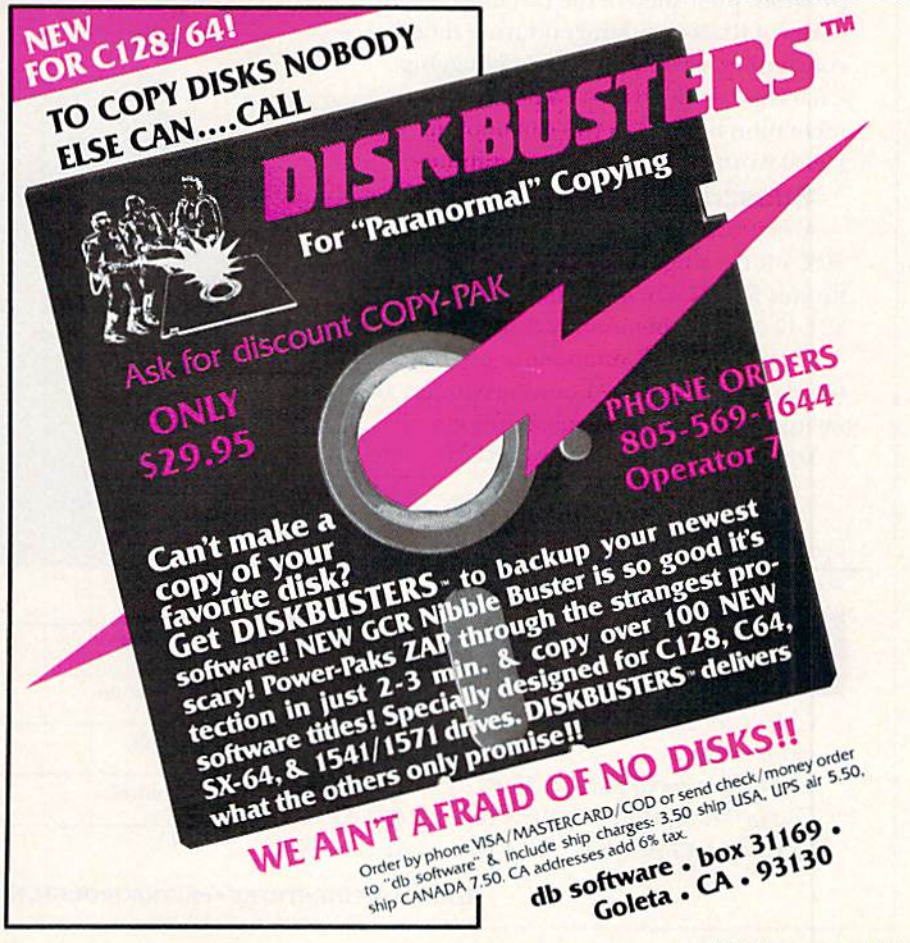
As many newspapers and magazines will tell you, however, the microcomputer revolution is over. Some experts predict that schools will pull back on hardware purchases and concentrate instead on developing software to fit their curricula. Can the Commodore success story in Canada's education market continue?

Mortimer believes it can: "We've just completed an excellent quarter. Teachers still feel that the 64 provides a lot of machine for the money. And we've had a lot of interest in the 128s."

Much of Commodore's Canadian success stems from enthusiastic employees, a clear focus on the potential of the education market and a concrete approach to customer needs. A company that has sold over five million C-64s worldwide can afford to be optimistic. R

Address all author correspondence to Gail Hook, 215 Anne St. N., Barrie, Ontario, Canada L4N 2E9.

Circle 157 on Reader Service card.



NEW FOR '86!

ReRUN QUARTERLY

BI-MONTHLY

Get Every Program In RUN

It's the best software news of 1986! Now you can get all of your favorite ready-to-run programs—not just selected programs—from RUN Magazine. Introducing ReRUN Bi-Monthly. . . one super disk containing two months' worth of *all* the outstanding Commodore programs listed in RUN. We've increased our frequency to serve you better. Each disk is packed with applications, utilities, and games that you can use in a ready-to-run format.

FREE Bonus Program!

And as a special bonus, each ReRUN Bi-Monthly features a previously unpublished *bonus* program. You'll get a FREE high-quality program that will be a perfect complement to your Commodore software library.

The Latest RUN Programs—Instantly!

Throughout the year, you'll enjoy every program published in the two most recent issues of RUN—without enduring time-consuming keyboarding and debugging. Each issue comes with a Four-color documentation booklet so you can boot up your favorite programs in just minutes!

Subscribe Now—SAVE 30%

And if you subscribe to ReRUN *now*, you'll *save 30%* off the single copy price! You get all six issues for just $89.97. Or, order individually and pay $21.47 for each bi-monthly disk.

Get more great Commodore programs more often in 1986, plus *free* bonus programs, and a 30% savings with a one-year subscription.

You'll get it all in the new ReRUN.



YES! **I WANT MORE ReRUN IN '86. PLEASE SEND ME:**

- ☐ 1 yr. (6 issues) for $89.97. I save 30% off the individual price.
- ☐ The January/February ReRUN disk for $21.47.
- ☐ The March/April ReRUN disk for $21.47.
- ☐ Payment Enclosed ☐ Visa ☐ AE ☐ MC

Card # _____ Exp. Date _____

Signature _____

Name _____

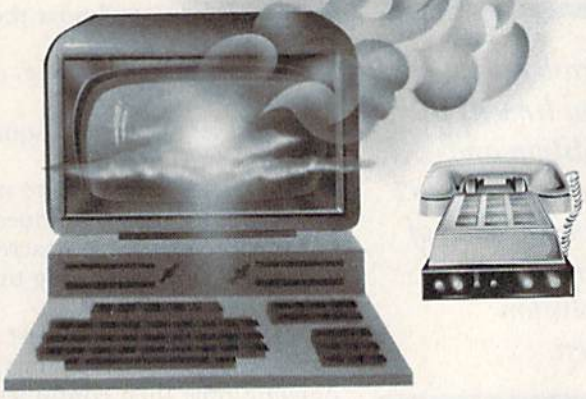
Address _____

City _____ State _____ Zip _____

ReRUN • 80 PINE STREET • PETERBOROUGH, NH 03458 6-86

If you compute after dark...

...switch to the magic of GEnie™ and stay on-line longer, for less!



Introducing GEnie, the General Electric Network for Information Exchange. It's part of General Electric Information Services—the largest commercial teleprocessing network.

Now the power of GEnie stands ready to bring a little magic into the life of PC owners just like you. And for potentially much less than other on-line information services.

With GEnie, you pay no hidden charges or monthly minimum fees. You pay only for the actual time you're on-line and the $18.00 registration fee. Nothing more.

Compare & Save

	Services						Pricing			
	SIGs/User Groups	Electronic Mail	CB Simulator	Computing News	Games	2400 baud access	Registration fee	Monthly minimum	Non-prime time rates 300 baud	Non-prime time rates 1200 baud
GEnie*	**X**	**X**	**X**	**X**	**X**	**X**	**$18.00**	**none**	**$5.00**	**$5.00**
CompuServe	X	X	X	X	X	X	$39.95	none	$6.25	$12.75
The Source	X	X	no	X	X	X	$49.95	$10.00	$8.40	$10.80

*Rates and Services shown in effect 12/85. Non-prime time rate applies Mon–Fri, 6pm–8am local time, all day Sat., Sun., and nat'l. holidays. Subject to service availability. Additional surcharge applies for 2400 baud service.

Save up to 60%

Check out the chart above and compare it for yourself. You'll find GEnie can deliver all of your favorite services for an incomparable price at incomparable savings!

Put the power of GEnie at your command

- Discuss the latest in computer products and accessories or download public domain software with GEnie's ***RoundTable™ Special Interest Groups.***
- Meet new people, share ideas with friends—old and new—with ***LiveWire™***, GEnie's CB simulator that has everybody talking!
- Get your message across and back again with ***GE Mail ™***, GEnie's electronic mail service.
- Organize a local, regional or national get-together in one of GEnie's 40 "conference rooms" with GEnie's ***Business Band Real-Time Conferencing.***
- Go one-on-one with classic computer games, match your wits against others with multi-player games, or download for future play in GEnie's ***Game Room.***
- Stay in touch with what's new on the microcomputer scene, courtesy of GEnie's news service, ***News and Commentary.***

GEnie can take you to new highs in speed and keep you there. Because our non-prime time rate for 300 OR 1200 baud is only $5.00 an hour. And that means you save 20 to 60%. Or if you prefer, 2400 baud service is now available.

With services and prices like these—talk, read, learn, or play to your heart's content. Because now you can keep your eyes on the screen, not on the clock.

With your personal computer, modem, communications software, and telephone, you already have everything you need to make GEnie come to life. So why not Sign-Up today. Let GEnie bring a little magic into your life!

Sign Up From Your Keyboard Today 4 Easy Steps:

1. Have ready your VISA, MasterCard or checking account number to set up your personal GEnie account.
2. Set your modem for half duplex (local echo)—300 or 1200 baud.
3. Dial **1-800-638-8369.** When connected, enter HHH
4. At the U# = prompt, enter **XJM11945,GENIE** then RETURN.

No Modem Yet? Need more information or assistance?
We can help! Call **1-800-638-9636, ext. 21.**

Get on-line with GEnie. And stay longer, for less.

INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

Arithme-Sketch

By JAMES PELLECHI

Arithme-Sketch combines arithmetic and drawing in a unique way. The menu prompts you to select addition or subtraction and then a grade level from 1–5. The first-grade level selects problems with one-digit numbers, the second-grade level two-digit numbers, and so on.

The program displays a sheet of wide-lined paper on a clipboard. Each problem appears on the paper in large block numbers. Sound and visual effects accompany answers. After five problems have been answered, the program moves to the drawing screen.

Drawing is done with a joystick plugged into port 2. The amount of time allotted for drawing depends on how many problems were answered correctly; each correct answer earns one minute of drawing time. The time remaining is displayed at the top of the screen, and when it runs out, your artwork is saved in memory, and the clipboard displaying the main menu appears for another round of math.

This program gives children a grand time as they practice addition and subtraction, and every correct answer earns one minute of drawing time on the low-resolution screen.

While in Drawing mode, you may use the following keys or combinations thereof.

Joystick fire-button—Pressing the button turns a square on. Releasing the button allows you to move the cursor anywhere on the screen.

Numbers 1–8—Selects one of eight drawing colors.

Shift—Erases whatever square the cursor is currently on.

F1 key—Saves the screen to memory; drawing time then continues.

F2 key—Replaces current screen with screen last saved; drawing time then continues.

CTRL-f1—Erases current screen (saved screen remains unchanged); drawing time then continues.

Shift Lock—Automatically erases individual squares on the screen as the cursor is moved by the joystick.

CTRL-logo—Aborts Drawing mode; saves final screen to memory; returns to menu. Ⓡ

Address all author correspondence to James Pellechi, 269 Pinecone St., Middle Island, NY 11953.

Listing 1. *Arithme-Sketch program.*

```
10 PRINTCHR$(142):GOTO560:REM*86
30 REM ARITHME-SKETCH BY TED JEA
   N & JIM PELLECHI      :REM*140
80 REM RIGHT ANSWER      :REM*92
90 POKEV,15:FORTT=1TO3:POKED,10:
   POKER,64+11:POKESU,23:POKES1,
   23:POKEU,4            :REM*216
100 POKEW,21:FORT=1TO50:NEXT:POK
    EW,20                :REM*168
110 FORT=1TO16:POKE5328Ø,PEEK(53
    28Ø)+1AND15:NEXT:NEXT:POKE53
    28Ø,14:RETURN        :REM*14
120 : KEY PRESSED        :REM*32
130 POKEV,15:POKEU,110:POKED,15:
    POKER,9:POKEW,17:FORT=1TO90:
    NEXT:POKEV,Ø         :REM*162
140 FORT=ØTO24:POKEB+T,Ø:NEXT:RE
    TURN                 :REM*182
150 : WRONG ANSWER       :REM*164
160 POKE5328Ø,9:FORTT=1TO25:POKE
    V,10                 :REM*180
170 FORT=1TO3:NEXT:POKEV,Ø:FORI=
    1TO3:NEXT:NEXT:POKE5328Ø,14:
    RETURN               :REM*244
180 REM LARGE NUMBERS    :REM*216
190 ON(A+1) GOSUB200,210,220,230
    ,240,250,260,270,280,290:PRI
    NTCHR$(29);:RETURN   :REM*218
200 PRINT"{CTRL 9} {CRSR LF}{CRS
    R UP} {CRSR LF}{CRSR UP}{3 S
    PACEs}{CRSR LF}{CRSR DN} {CR
    SR LF}{CRSR DN} {CRSR LF}{CR
    SR DN} {CRSR LF}{CRSR DN} {2
     CRSR LFs} {2 CRSR LFs} {CRS
    R LF}{CRSR UP} {2 CRSR RTs}{
    CRSR UP}";:RETURN: Ø:REM*156
210 PRINT"{CTRL 9}{2 CRSR UPs}{C
    RSR RT} {CRSR LF}{CRSR DN} {
    CRSR LF}{CRSR DN} {CRSR LF}{
    CRSR DN} {CRSR LF}{CRSR DN}
    {2 CRSR UPs}{CRSR RT}";:RETU
    RN: 1                :REM*56
220 PRINT"{CTRL 9}{2 CRSR UPs}{3
     SPACEs}{CRSR LF}{CRSR DN} {
    CRSR LF}{CRSR DN} {2 CRSR LF
    s} {2 CRSR LFs} {CRSR LF}{CR
    SR DN} {CRSR LF}{CRSR DN}{3
    SPACEs}{2 CRSR UPs}";:RETURN
    : 2                  :REM*74
230 PRINT"{CTRL 9}{2 CRSR UPs}{3
     SPACEs}{CRSR LF}{CRSR DN} {
    CRSR LF}{CRSR DN} {2 CRSR LF
    s} {2 CRSR LFs} {CRSR LF}{2
    CRSR DNs}{3 SPACEs}{CRSR LF}
    {CRSR UP} {CRSR UP}";:RETURN
    : 3                  :REM*80
240 PRINT"{CTRL 9}{2 CRSR UPs} {
    CRSR LF}{CRSR DN} {CRSR LF}{
    CRSR DN}{3 SPACEs}{2 CRSR UP
    s}{CRSR LF} {CRSR LF}{CRSR D
    N} {CRSR LF}{2 CRSR DNs} {CR
    SR LF}{CRSR DN} {2 CRSR UPs}
    ";:RETURN: 4         :REM*138
250 PRINT"{CTRL 9}{2 CRSR UPs}{3
     SPACEs}{3 CRSR LFs}{CRSR DN
```

→

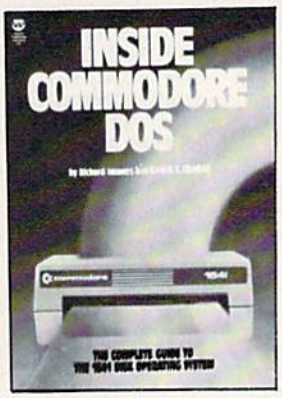
RUN It Right

C-64; C-128 (in C-64 mode)

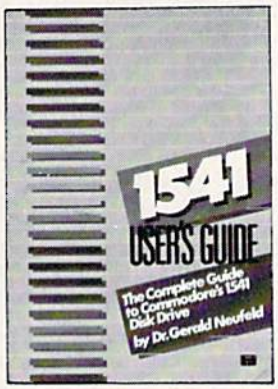
Circle 14 on Reader Service card.

BRADY adds more power to your Commodore.

Nobody understands how to get the most out of Commodore computers—without having to add more machine—better than Brady Books. And now you can too. Call toll-free or use the coupon below to order today.



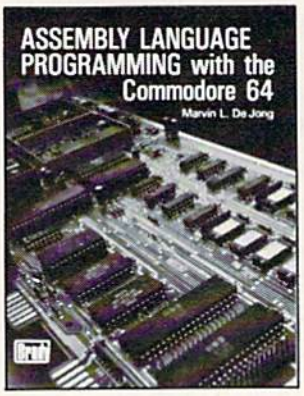
1. Teaches you about using the DOS, disk formatting and organization, direct-access programming, DOS protection recovering "damaged" data, and includes an overview of DOS 2.6. Also includes disk RAM map, math conversion routines, and a disassembled and annotated DOS. $19.95



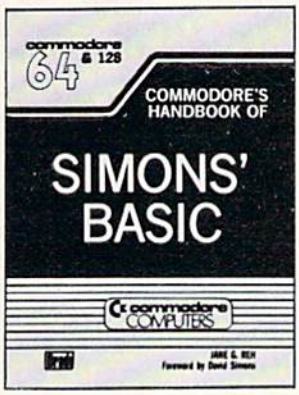
2. Clarifies confusing areas and corrects omissions in the equipment's user's manual. You'll learn how to validate, initialize, reuse disks, and more. Also includes a mailing list application listing for demonstration as well as some of the best utility programs. $19.95



3. A revision of the bestselling classic (old edition shown above), this real learn-by-doing tutorial includes discussions of chip architecture along with commands and important concepts such as output, address modes, memory maps, and linking BASIC to machine language. Perfect for new 1028 owners. $14.95 (Disk available)



4. Perfect beginner's introduction to assembler. Shows how to write, debug, and execute programs and includes exercises to familiarize you with the instruction set of the 6510 processor. $14.95 (Disk and kit available)



5. With a foreword written by David Simon himself, here's the first and last word on Simons' BASIC. A complete reference to 144 commands, and includes a "guided-tour" of practical tips for this language. For both the 64 and 128. $12.95

Now at your book or computer store.
Or order toll-free today: **800-624-0023** In New Jersey: 800-624-0024

BRADY COMMUNICATIONS COMPANY, INC.
c/o Prentice Hall,
P.O. Box 512, W. Nyack, NY 10994

Circle the numbers of the titles you want below. (Payment must be enclosed; or, use your charge card.) Add $1.50 for postage and handling. Enclosed is check for $_____ or charge to
☐ MasterCard ☐ VISA.

Acc't # _____ Exp. date _____
Signature _____
Name _____
Address _____
City _____ State _____ Zip _____
(New Jersey residents, please add applicable sales tax.)
Dept. 3 GR-CRUN-BH(4)

1 (0-8359-3091-2) 2 (0-89303-738-9) 3 (0-89303-652-8) 4 (0-89303-319-7) 5 (0-89303-419-3)

Brady

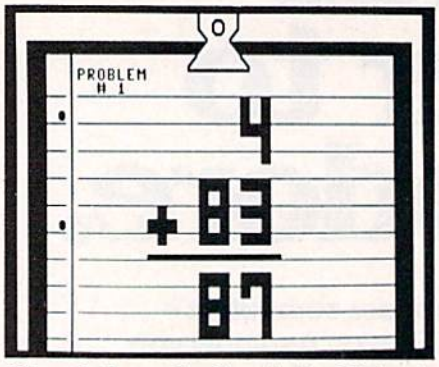


Photo 1. Example of vertical addition in Arithme-Sketch program.

Listing 1 continued.

```
    } {CRSR LF}{CRSR DN}{3 SPACE
    s}{CRSR LF}{CRSR DN} {3 CRSR
     LFs}{CRSR DN}{3 SPACEs}{2 C
    RSR UPs}";:RETURN: 5  :REM*4
260 PRINT"{CTRL 9}{2 CRSR UPs} {
    CRSR LF}{CRSR DN} {CRSR LF}{
    CRSR DN}{3 SPACEs}{3 CRSR LF
    s}{CRSR DN} {CRSR LF}{CRSR D
    N}{3 SPACEs}{CRSR UP}{CRSR L
    F} {CRSR UP}";:RETURN: 6
                          :REM*95
270 PRINT"{CTRL 9}{CRSR UP} {CRS
    R LF}{CRSR UP}{3 SPACEs}{CRS
    R LF}{CRSR DN} {CRSR LF}{CRS
    R DN} {CRSR LF}{CRSR DN} {CR
    SR LF}{CRSR DN} {2 CRSR UPs}
    ";:RETURN: 7          :REM*233
280 PRINT"{CTRL 9} {CRSR LF}{CRS
    R UP} {CRSR LF}{CRSR UP}{3 S
    PACEs}{CRSR LF}{CRSR DN} {CR
    SR LF}{CRSR DN} {CRSR LF}{CR
    SR DN} {CRSR LF}{CRSR DN} {2
     CRSR LFs} {2 CRSR LFs} {CRS
    R LF}{CRSR UP} {CRSR UP} {CR
    SR RT}";:RETURN: 8  :REM*115
290 PRINT"{CTRL 9} {CRSR LF}{CRS
    R UP} {CRSR LF}{CRSR UP}{3 S
    PACEs}{CRSR LF}{CRSR DN} {CR
    SR LF}{CRSR DN} {CRSR LF}{CR
    SR DN} {CRSR LF}{CRSR DN} {2
     CRSR LFs} {2 CRSR LFs} {2 C
    RSR UPs} {CRSR RT}";:RETURN:
     9                    :REM*11
300 ON GL GOTO310,320,330,340,35
    0                     :REM*243
310 S=8:SL=15:LL= 8:RETURN:REM*9
320 S=6:SL=13:LL=12:RETURN
                          :REM*239
330 S=4:SL=12:LL=15:RETURN
                          :REM*217
340 S=2:SL=10:LL=19:RETURN
                          :REM*191
350 S=0:SL= 8:LL=23:RETURN
                          :REM*141
360 REM CLIPBOARD          :REM*35
370 POKE53280,14:POKE53281,7
                          :REM*85
380 PRINT"{HOME}{COMD 2}{18 SPAC
    Es}{COMD H}{SHFT U}{SHFT I}{
    COMD N}{18 SPACEs}";:REM*251
390 PRINT"{18 SPACEs}{SHFT M}{SH
    FT J}{SHFT K}{SHFT N}{18 SPA
    CEs}";                :REM*85
400 PRINT" {CTRL 9}{17 SPACEs}{C
    TRL 0}{SHFT LB.}{2 SPACEs}{C
    OMD *}{CTRL 9}{17 SPACEs}{CT
    RL 0}"                :REM*227
410 PRINT" {CTRL 9}{2 SPACEs}{CT
    RL 0}{2 SPACEs}{CTRL 3}{SHFT
     -}{COMD 2}{11 SPACEs}{SHFT
    N}{4 SPACEs}{SHFT M}{14 SPAC
    Es}{CTRL 9}{2 SPACEs}"
                          :REM*115
420 PRINT" {CTRL 9}{2 SPACEs}{CT
    RL 0}{2 SPACEs}{CTRL 3}{SHFT
     -}{COMD 2}{11 SPACEs}{6 COM
    D Ys}{14 SPACEs}{CTRL 9}{2 S
    PACEs}{CRSR UP}":FORA=0TO9
                          :REM*249
430 PRINT"{CRSR DN} {CTRL 9}{2 S
    PACEs}{CTRL 0}{2 SPACEs}{CTR
    L 3}{SHFT -}{COMD 2}{31 SPAC
    Es}{CTRL 9}{2 SPACEs}"
                          :REM*109
440 PRINT" {CTRL 9}{2 SPACEs}{CT
    RL 0}{CTRL 7}{2 COMD Ts}{CTR
    L 3}{SHFT -}{CTRL 7}{31 COMD
     Ts}{COMD 2}{CTRL 9}{2 SPACE
    s}{CRSR UP}":NEXT     :REM*131
450 FORA=1308TO1948STEP320:POKEA
    ,81:NEXT:RETURN       :REM*123
460 REM TITLE SCREEN      :REM*237
470 GOSUB370              :REM*33
480 PRINT LINE$(8)SPC(14)"ARITHM
    E-SKETCH"             :REM*255
490 PRINT LINE$(9)SPC(14);
                          :REM*107
500 FOR A=1TO14:PRINT CHR$(183);
    :NEXT                 :REM*81
510 PRINT LINE$(12)SPC(10)"WHAT
    KIND OF PROBLEMS ?"   :REM*191
520 PRINT LINE$(16)SPC(7)"PRESS{
    2 SPACEs}+{2 SPACEs}FOR ADDI
    TION"                 :REM*176
530 PRINT LINE$(18)SPC(7)"PRESS{
    2 SPACEs}-{2 SPACEs}FOR SUBT
    RACTION"              :REM*158
540 PRINT LINE$(22)SPC(12)"YOUR
    CHOICE ";:RETURN      :REM*170
550 REM CURSOR CONTROL    :REM*174
560 DIM LINE$(25)         :REM*26
570 LINE$(1)=CHR$(19)     :REM*120
580 FOR A=2TO25           :REM*66
590 LINE$(A)=LINE$(A-1)+CHR$(17)
    :NEXT                 :REM*6
600 REM CONSTANTS         :REM*56
610 ZZ=1:SC=1065:CO=54272:CL=0
                          :REM*92
620 REM JOYSTICK TABLE    :REM*206
630 FOR A=0TO10:READ XY(A):NEXT
                          :REM*192
640 DATA 0,-40,40,0,-1,-41
                          :REM*164
650 DATA 39,0,1,-39,41     :REM*8
660 REM KEYBOARD TABLE    :REM*146
670 DIM KEY(64)           :REM*64
680 FOR A=0TO64:KEY(A)=0:NEXT
                          :REM*192
690 KEY(08)=11:KEY(11)=15:KEY(16
    )=5                   :REM*66
700 KEY(19)=6:KEY(24)=7:KEY(27)=
    8                     :REM*192
710 KEY(56)=1:KEY(59)=2   :REM*24
720 REM ML                :REM*62
730 AD=49152              :REM*54
740 READ A:IFA<>-1THENPOKEAD,A:A
    D=AD+1:GOTO740        :REM*142
750 DATA 162,4,160,196,32,30,192
                          :REM*202
760 DATA 162,216,160,200,32,30
                          :REM*50
770 DATA 192,96,162,196,160,4
                          :REM*81
780 DATA 32,30,192,162,200,160
                          :REM*57
790 DATA 216,32,30,192,96
                          :REM*215
800 DATA 142,42,192,140,45,192
                          :REM*229
810 DATA 160,4,162,0,189,0,0
                          :REM*93
820 DATA 157,0,0,202,208,247
                          :REM*119
830 DATA 238,42,192,238,45,192
                          :REM*133
840 DATA 136,208,238,96,-1
                          :REM*149
850 REM SOUND             :REM*129
860 B=54272:FORT=0TO24:POKEB+T,0
    :NEXT                 :REM*117
870 V=B+24:W=B+4:U=B+1:D=B+5:R=B
    +6:S1=B+14:SU=B+15    :REM*23
880 REM DISPLAY TITLE     :REM*189
890 PRINT"{SHFT CLR}":GOSUB470:P
    OKE198,0              :REM*145
900 PRINT"?"CHR$(149)CHR$(157);:
    IF PEEK(162)AND32 THEN PRINT
    CHR$(158);            :REM*81
910 GETAN$:IFAN$<>"+"ANDAN$<>"-"
    THEN900               :REM*31
920 PRINTCHR$(149)AN$:GOSUB130:F
    OR A=1TO500:NEXT      :REM*43
930 REM DIFFICULTY LEVEL:REM*213
940 GOSUB370              :REM*249
950 PRINT LINE$(6)SPC(11)"SELECT
     GRADE LEVEL"         :REM*107
960 PRINT LINE$(10)SPC(11)CHR$(1
    8)"1"SPC(5)CHR$(146)" FIRST
    GRADE"                :REM*89
970 PRINT LINE$(12)SPC(11)CHR$(1
    8)"2"SPC(5)CHR$(146)"SECOND
    GRADE"                :REM*105
980 PRINT LINE$(14)SPC(11)CHR$(1
    8)"3"SPC(5)CHR$(146)" THIRD
    GRADE"                :REM*245
990 PRINT LINE$(16)SPC(11)CHR$(1
    8)"4"SPC(5)CHR$(146)"FOURTH
    GRADE"                :REM*49
1000 PRINT LINE$(18)SPC(11)CHR$(
     18)"5"SPC(5)CHR$(146)" FIFT
     H GRADE"             :REM*93
1010 PRINT LINE$(24)SPC(9)"PICK
     ANY GRADE"CHR$(149)"{2 SPAC
     Es}1 - 5"            :REM*243
1020 IFPEEK(162)AND32THENPRINTCH
     R$(158);             :REM*169
1030 GETA$:ON-(A$<"1"ORA$>"5"ORA
     $="")GOTO1010:GOSUB130
                          :REM*220
1040 NN=10{UP ARROW}(VAL(A$))-1:
     MM=NN                :REM*44
1050 :                     :REM*6
1060 REM INSTRUCTIONS      :REM*72
1070 GOSUB370              :REM*124
1080 PRINT LINE$(8)SPC(10)"YOU W
     ILL NOW GET 5"        :REM*4
1090 PRINT LINE$(10)SPC(10)CHR$(
     18);                 :REM*44
1100 IFAN$="+"THEN PRINT"ADDITIO
     N PROBLEMS.":GOTO1120
                          :REM*144
1110 PRINT"SUBTRACTION PROBLEMS.
     "                    :REM*50
1120 PRINT LINE$(12)SPC(10)"FOR
     EVERY RIGHT ANSWER,":REM*72
1130 PRINT LINE$(14)SPC(10)"YOU
     WILL GET 1 MINUTE"  :REM*160
1140 PRINT LINE$(16)SPC(10)"OF D
     RAWING TIME."        :REM*34
1150 PRINT LINE$(20)SPC(15);
                          :REM*80
1160 FOR A=1TO11:PRINT CHR$(175)
     ;:NEXT               :REM*166
1170 PRINT LINE$(21)SPC(15)CHR$(
     18)" GOOD LUCK "     :REM*150
1180 PRINT LINE$(22)SPC(15);
                          :REM*118
1190 FOR A=1TO11:PRINT CHR$(163)
     ;:NEXT:POKE198,0     :REM*82
1200 PRINT LINE$(24)SPC(8)"PRESS
      "                   :REM*24
```

→

Circle 105 on Reader Service card.

RAVE REVIEWS

RUN Magazine says, "... rugged design ... ease of use ... make it everyone's favorite ..."

"... outstanding 1525 emulation cannot be overemphasized."

"... 1525 emulation is so near perfect ... you'll be hard pressed to find software designed to work with the Commodore ... that will not work ..."

"... it is a sophisticated interface ... posesses an above average level of quality ..." RUN Dec. 1985 issue

PPI™ with graphics buffer

PARALLEL PRINTER INTERFACE



$49.95
(suggested retail)

FOR USE WITH THE COMMODORE Vic 20, C64 and 128 PC

IMPORTANT FEATURES that may not be found on other interfaces:

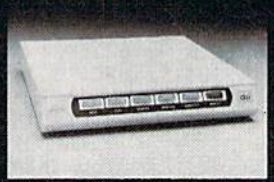
- High Speed Graphics Buffer.
- Works properly with all Commodore compatible software.
- Transparent Mode Lock Controls.
- Total Emulation of Commodore's Graphic, Character and Command Set.
- True Commodore Graphics.
- Combining of Emulation and Transparent Modes.
- No Confusing DIP switches.
- 15 page easy to follow Users Manual.
- FCC Approved.

PRINTERS

Smith Corona Fast Text 80
Smith Corona DP series
Smith Corona 200✲
Smith Corona 300✲
Smith Corona 400✲
Royal 600✲
Royal 610✲
Riteman
Radix
Star Gemini X & SG series
MPI SX Printer✲
MPI X Printer✲
Panasonic KXP
Inforunner
Star Delta
Blue Chip
Citizen
BMC
Mannesmann Tally MT160
Olympia Compact NP
Brother CE-50✲
Brother CE-58✲
Brother DM-40
Brother DX-5
Fujitsu
Epson

✲ Special interface or adapter cable required. Contact DSI.

The PPI works with all Centronics compatible parallel printers that utilize standard ASCII characters and command sets in the transparent mode.



DIRECTOR
The DIRECTOR is a surge, spike, RFI, and EMI interference suppressed 5 outlet power control center for computers and peripherals.



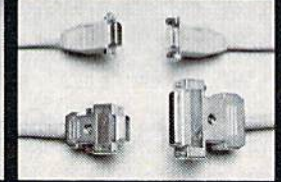
DATA SWITCH
Six DATA SWITCH models allow port expansion and sharing of computer and peripherals.



MESSENGER MODEM
The MESSENGER is an auto answer/dial modem with complete telecom software for use with Commodore C64 and 128 PC.



COMPUTER DISKETTE NOTCHER
Converts any single sided diskette to a double sided diskette.



RGB CABLE ASSEMBLIES
RBG cable assemblies that connect the Commodore 128 PC and Amiga to Amdek, Sakata, Princeton Graphics, Taxan, Magnavox, Teknika, Sharp, Panasonic, NEC, and Sony RGB monitors.

Distributor and dealer programs available. Call 316-264-6118 for immediate information.

dsi
717 SOUTH EMPORIA
WICHITA, KANSAS 67211-2307
(316) 264-6118
Telex No. 650-193-4977

DSI is a major OEM and private label manufacturer. Call for complete information and quotations.

Listing 1 continued.

```
121Ø PRINT LINE$(24)SPC(14)"ANY
     KEY"CHR$(149)" TO CONTINUE"
                          :REM*66
122Ø IFPEEK(162)AND32THENPRINTCH
     R$(158);             :REM*114
123Ø GETA$:ON-(A$="")GOTO121Ø:GO
     SUB13Ø               :REM*178
124Ø REM BEGIN MATH       :REM*7Ø
125Ø PROB=1:TL=Ø:POKE198,Ø
                          :REM*138
126Ø GOSUB19ØØ:TRY=Ø      :REM*1Ø8
127Ø GOSUB37Ø             :REM*68
128Ø REM MATH PROBLEMS    :REM*179
129Ø PRINT LINE$(Ø5)SPC(6)"PROBL
     EM"SPC(35)"#"PROB:GOSUB3ØØ
                          :REM*111
13ØØ PRINTLINE$(Ø9)SPC(12)SPC((G
     L-LN)*4+S);          :REM*61
131Ø ON LN GOTO137Ø,136Ø,135Ø,13
     4Ø,133Ø,132Ø         :REM*141
132Ø A=N(1):GOSUB19Ø      :REM*123
133Ø A=N(2):GOSUB19Ø      :REM*197
134Ø A=N(3):GOSUB19Ø      :REM*15
135Ø A=N(4):GOSUB19Ø      :REM*91
136Ø A=N(5):GOSUB19Ø      :REM*165
137Ø A=N(6):GOSUB19Ø      :REM*239
138Ø PRINTLINE$(15)SPC(12)SPC((G
     L-LM)*4+S);          :REM*63
139Ø ON LM GOTO145Ø,144Ø,143Ø,14
     2Ø,141Ø,14ØØ         :REM*59
14ØØ A=M(1):GOSUB19Ø      :REM*187
141Ø A=M(2):GOSUB19Ø       :REM*5
142Ø A=M(3):GOSUB19Ø      :REM*79
143Ø A=M(4):GOSUB19Ø      :REM*155
144Ø A=M(5):GOSUB19Ø      :REM*229
145Ø A=M(6):GOSUB19Ø      :REM*47
146Ø PRINTLINE$(16)SPC(SL);
                          :REM*167
147Ø IF AN$="+"THEN PRINT"{3 SPA
     CEs}{2 CRSR LFs}{CRSR UP} {
     CRSR LF}{2 CRSR DNs} ":GOTO
     149Ø                 :REM*1Ø5
148Ø PRINT "{2 COMD Ps}":REM*189
149Ø PRINTLINE$(18)SPC(SL);
                          :REM*2Ø5
15ØØ FOR A=ØTO LL:PRINT CHR$(185
     );:NEXT              :REM*195
151Ø PRINT LINE$(22)SPC((SL+LL)-
     2);                  :REM*35
152Ø GOSUB2Ø5Ø:REM DIGIT 1
                          :REM*115
153Ø ANS=VAL(A$)          :REM*183
154Ø IF N3<1Ø THEN169Ø    :REM*1Ø4
155Ø GOSUB2Ø5Ø:REM DIGIT 2
                          :REM*21Ø
156Ø ANS=ANS+(VAL(A$)*1Ø)
                          :REM*114
157Ø IF N3<1ØØ THEN169Ø :REM*1Ø2
158Ø GOSUB2Ø5Ø:REM DIGIT 3
                          :REM*48
159Ø ANS=ANS+(VAL(A$)*1ØØ)
                          :REM*9Ø
16ØØ IF N3<1ØØØ THEN169Ø :REM*68
161Ø GOSUB2Ø5Ø:REM DIGIT 4
                          :REM*144
162Ø ANS=ANS+(VAL(A$)*1ØØØ)
                          :REM*16
163Ø IF N3<1ØØØØ THEN169Ø
                          :REM*224
164Ø GOSUB2Ø5Ø:REM DIGIT 5
                          :REM*238
165Ø ANS=ANS+(VAL(A$)*1ØØØØ)
                          :REM*88
166Ø IF N3<1ØØØØØ THEN169Ø
                          :REM*252
167Ø GOSUB2Ø5Ø:REM DIGIT 6
                          :REM*76
168Ø ANS=ANS+(VAL(A$)*1ØØØØØ)
                          :REM*2Ø4
169Ø PRINTCHR$(18);:IF N3=ANS TH
     EN177Ø               :REM*124
17ØØ GOSUB16Ø:TRY=TRY+1:IF TRY=2
      THEN173Ø            :REM*Ø
171Ø PRINT LINE$(1)SPC(3)"INCORR
     ECT !!"SPC(11)" TRY AGAIN "
                          :REM*2
172Ø FOR A=1TO2ØØØ:NEXT:GOTO127Ø
                          :REM*8Ø
173Ø PRINT LINE$(1)SPC(2)"WRONG
     AGAIN ..."SPC(6)" THE ANSWE
     R IS "               :REM*16Ø
174Ø PRINTLINE$(2)SPC(24);:IFGL<
     4THENPRINT" ";:IFGL=1THENPR
     INT" ";              :REM*58
175Ø PRINT"*** "MID$(STR$(N3),2)
     " ***"               :REM*8Ø
176Ø GOTO179Ø             :REM*62
177Ø TL=TL+1              :REM*246
178Ø PRINT LINE$(1)SPC(4)" EXCEL
     LENT "SPC(1Ø)" ANSWER !!!":
     GOSUB9Ø              :REM*15Ø
179Ø PRINTCHR$(146):FOR A=1TO14Ø
     Ø:NEXT               :REM*138
18ØØ PROB=PROB+1:IF PROB<6 THEN1
     26Ø                  :REM*149
181Ø POKE5328Ø,14:POKE53281,2
                          :REM*211
182Ø POKE646,1:PRINT CHR$(147)
                          :REM*173
183Ø PRINT LINE$(6)SPC(1Ø)"YOU G
     OT "TL" RIGHT!"      :REM*69
184Ø PRINT LINE$(9)SPC(8)"NOW IT
      IS TIME TO DRAW."   :REM*2Ø3
185Ø PRINT LINE$(16)SPC(8)"USE J
     OYSTICK IN CONTROL":REM*249
186Ø PRINT LINE$(18)SPC(15)"PORT
      # 2"                :REM*37
187Ø FOR A=1TO4ØØØ:NEXT   :REM*69
188Ø GOTO211Ø             :REM*93
189Ø REM RANDOM NUMBERS :REM*133
19ØØ FORX=1TO6:N(X)=-1:NEXT
                          :REM*181
191Ø FORX=1TO6:M(X)=-1:NEXT
                          :REM*189
192Ø N=INT((RND(Ø)* NN)+1):REM*5
193Ø M=INT((RND(Ø)* MM)+1)
                          :REM*219
194Ø IF AN$="+"THEN N3=N+M:GOTO1
     98Ø                  :REM*7
195Ø IF N=M THEN193Ø      :REM*253
196Ø IF N<M THEN N3=N:N=M:M=N3
                          :REM*33
197Ø N3=N-M               :REM*19
198Ø N1$=STR$(N):LN=LEN(N1$)-1
                          :REM*247
199Ø X=1:FORA=(7-LN)TO6:N(A)=VAL
     (MID$(N1$,X+1,1)):X=X+1:NEX
     T                    :REM*87
2ØØØ M1$=STR$(M):LM=LEN(M1$)-1
                          :REM*247
2Ø1Ø X=1:FORA=(7-LM)TO6:M(A)=VAL
     (MID$(M1$,X+1,1)):X=X+1:NEX
     T                    :REM*63
2Ø2Ø IF LN-LM<ØTHEN GL=LM:RETURN
                          :REM*167
2Ø3Ø GL=LN:RETURN         :REM*1Ø7
2Ø4Ø REM GET DIGIT        :REM*55
2Ø5Ø POKE198,Ø            :REM*178
2Ø6Ø PRINT"?"CHR$(149)CHR$(157);
     :IFPEEK(162)AND32THENPRINTC
     HR$(158);            :REM*222
2Ø7Ø GETA$:IFA$<"Ø"ORA$>"9"THEN2
     Ø6Ø                  :REM*238
2Ø8Ø A=VAL(A$):PRINTCHR$(158)CHR
     $(16Ø)CHR$(149)CHR$(157)CHR
     $(157);:GOSUB19Ø     :REM*252
2Ø9Ø FORA=ØTO6:PRINT CHR$(157);:
     NEXT:GOSUB13Ø:RETURN
                          :REM*1Ø8
21ØØ REM                  :REM*122
211Ø REM DRAW ROUTINE     :REM*22
212Ø PRINT CHR$(151);CHR$(147);
                          :REM*188
213Ø POKE5328Ø,8:POKE53281,15
                          :REM*156
214Ø IF ZZ=Ø THENSYS(49167):GOTO
     22ØØ                 :REM*182
215Ø PRINTCHR$(18)"%%%%%%%%%%%%
      TIME ={8 SPACEs}%%%%%%%%%
     %%%";                :REM*2Ø8
216Ø FORX=1TO23:PRINTSPC(38)"%%"
     ;:NEXT               :REM*12Ø
217Ø PRINT"%%% F1= SAVE %%%%%%%
     % F2= RESTORE %%%"CHR$(157)
     CHR$(148)"%"CHR$(19):REM*94
218Ø ZZ=Ø:IFER=1THEN SC=1Ø65:ER=
     Ø:RETURN              :REM*198
219Ø SYS(49152)           :REM*4Ø
22ØØ TIME$="ØØØØØØ"        :REM*8
221Ø T2$=MID$(TIME$,4,1):REM*162
222Ø T3$=MID$(TIME$,5,2):REM*244
223Ø T2=TL-VAL(T2$)-1     :REM*38
224Ø T3=59-VAL(T3$)       :REM*2Ø
225Ø T3$=STR$(T3):IFT3<1ØTHENT3$
     =" Ø"+RIGHT$(T3$,1) :REM*54
226Ø PRINT LINE$(1)SPC(2Ø)CHR$(1
     8)T2":"T3$           :REM*192
227Ø IF T2<ØTHEN25ØØ      :REM*14
228Ø JV=PEEK(5632Ø):KV=PEEK(197)
     :SV=PEEK(653)        :REM*48
229Ø FB=16-(JV AND 16):JV=15-(JV
      AND 15)             :REM*172
23ØØ CH=PEEK(SC):CC=PEEK(SC+CO)
                          :REM*42
231Ø IF CH>127THEN POKESC,171:GO
     TO233Ø               :REM*157
232Ø POKE SC,43:POKE SC+CO,CL
                          :REM*29
233Ø FOR A=1TO5Ø:NEXT     :REM*247
234Ø POKE SC,CH:POKE SC+CO,CC
                          :REM*1Ø7
235Ø FOR A=1TO5Ø:NEXT     :REM*11
236Ø IF FB THENPOKE SC,16Ø:POKE
     SC+CO,CL             :REM*151
237Ø IFKEY(KV) THEN CL=KEY(KV)-1
                          :REM*2Ø7
238Ø IF SV=1 AND KV<>4 THEN POKE
      SC,32               :REM*19
239Ø IFKV<>4THEN245Ø      :REM*211
24ØØ IFSV=1THENGOSUB13Ø:SYS(4916
     7):GOTO245Ø:REM F2 KEY
                          :REM*133
241Ø IFSV=4THENER=1:ZZ=1:GOSUB21
     2Ø:REM{2 SPACEs}CONTROL KEY
     /F1 KEY (ERASE SCREEN)
                          :REM*235
242Ø IF SV THEN245Ø       :REM*219
243Ø GOSUB13Ø:SYS(49152):PRINTCH
     R$(147)LINE$(12)SPC(15)"S A
      V E D"              :REM*21
244Ø FORA=1TO999:NEXT:SYS(49167)
                          :REM*189
245Ø SC=SC+XY(JV):IF SV=6 THEN 2
     5ØØ:REM CONTROL KEY/LOGO KE
     Y (EXIT DRAW)        :REM*229
246Ø IF(SC<1Ø65)OR(SC>1982)THEN
     SC=SC-XY(JV)         :REM*237
247Ø IF(SC-1Ø64)/4Ø=INT((SC-1Ø64
     )/4Ø)THEN SC=SC-XY(JV)
                          :REM*43
248Ø IF(SC-1Ø63)/4Ø=INT((SC-1Ø63
     )/4Ø)THEN SC=SC-XY(JV)
                          :REM*47
249Ø GOTO221Ø             :REM*2Ø9
25ØØ GOSUB9Ø:SYS(49152):PRINTCHR
     $(147):GOTO89Ø       :REM*97
```

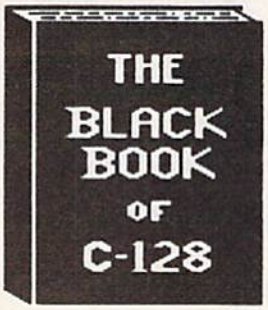
Circle 121 on Reader Service card.

VALUE-SOFT
9513 S.W. Barbur Blvd. B-56
Portland,Oregon 97219



TO ORDER—TOLL FREE
1-800-544-SOFT EXT. 19
Alaska, or information
1-503-246-0924
$2.00 S & H, Visa & Master Card gladly

THE REFERENCE HANDBOOK FOR THE C-128



YOU HAVE JUST PURCHASED ONE OF THE FINEST COMPUTERS COMMODORE HAS EVER OFFERED, NOW YOU NEED THE BEST REFERENCE MANUAL ON THE MARKET. YOU MAY NEVER NEED TO BUY ANOTHER MANUAL FOR THE C-128. BLACK BOOK, HAS IT ALL. THE AIM OF THE AUTHOR IS TO GIVE THE USER, AS MUCH INFORMATION, IN AS SMALL OF SPACE AS POSSIBLE. PLUS EVERYTHING IS IN PLAIN ENGLISH. THIS IS NOT THE START OF A SERIES AS SOME PUBLISHERS HAVE DONE, IT'S ALL IN ONE VOLUME.

OVER 75 EASY TO READ CHARTS AND TABLES
OVER 175 PAGES OF SOLID INFORMATION
NOT ONE WASTED PAGE
LAYS FLAT FOR EASY READING
COLOR CODED, ALWAYS FIND WHAT YOU NEED

WHAT BLACK BOOK WON'T TELL YOU.....

HOW TO UN-PACK THE C-128
HOW TO HOOK-UP THE C-128
TEN PAGES ON WHAT THE KEYS ARE FOR
FIFTY PAGES ON BASIC PROGRAM COMMANDS

WE ARE SO CERTAIN YOU WILL LIKE THE BLACK BOOK OF C-128, THAT WE MAKE THIS UNUSUAL OFFER: IF YOU DON'T FEEL THAT IT CONTAINS MORE INFORMATION THAN ANY OTHER REFERENCE BOOK FOR THE C-128, SEND IT BACK IN GOOD CONDITION WITHIN 10 DAYS. WE WILL REFUND THE PURCHASE PRICE WITH A SMILE.

$15.95

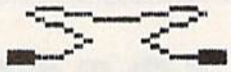
$ - SAVER SWITCH $29.95

USE THE SAVER SWITCH TO CONNECT TWO COMPUTERS TO ONE PRINTER, OR ONE DISK DRIVE. BETTER YET, USE ONLY ONE DRIVE AND ONE PRINTER FOR TWO COMPUTERS. MAYBE YOU WOULD RATHER CONECT TWO PRINTERS TO ONE COMPUTER, JUST THINK NO MORE CHANGING FROM LABELS TO LETTER HEAD ALL THE TIME. A FLIP OF THE SWITCH CHANGES THE DEVICE FROM ONE TO THE OTHER. SAVE BIG BUCKS WHERE MORE THAN ONE COMPUTER NEEDS TO ACCESS THE SAME DEVICE. PLUGS IN - NO ALTERATIONS OR EXTRAS NEEDED. STOP SWITCHING CABLES TODAY.



VIC-20 C-16 PLUS 4 C-64 C-128

9 FOOT CABLE



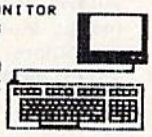
DISK DRIVES & PRINTERS $8.95

PROGRAMMER'S KIT $18.95

OVER 150 SUBROUTINES ON DISK. PREVIEW BEFORE YOU USE. JUST ADD TO YOUR OWN CODE. SORTS, INPUT, GRAPHICS, PRINTER & DISK OPERATION, ALPHABETS, ETC. WHY RE-INVENT THE WHEEL, PROGRAM THE EASY WAY. FOR THE C-64.

C-128 VIDEO CABLE $12.95

NO NEED TO BUY A NEW MONITOR FOR YOUR 128. WITH THIS CABLE YOU CAN USE YOUR 1701/1702 FOR 80 COLUMN MONOCHROME OUTPUT, SAVE DOLLARS, TAKE THE WIFE OUT TO DINNER.



PROTECTION REVEALED $19.95

TAKE COMMAND OF YOUR SOFTWARE. END THE SPIRAL OF BUYING COPY PROGRAMS. THE PROTECTION REVEALED HANDBOOK UNRAVELS THE PUZZLE OF SOFTWARE PROTECTION. FOR AUTHORS AND USERS BECOME A MASTER OF ILLUSION. LEARN HOW TO PROTECT OR UN-PROTECT YOUR SOFTWARE. INCLUDES A LARGE SECTION ON SUCCESSFUL BASIC PROGRAM SECURITY. COVERS THE LATEST EVOLUTION OF COPY PROTECTION TECHNIQUES. TOPICS INCLUDE:

DISK ERRORS	DE-COMPILERS	EXTRA SECTORS
COMPILERS	DENSITY CHANGES	GAP BYTES
HALF TRACKS	NIBBLE BACK-UP	GUARD BAND
NIBBLE COUNTING	DOS PROTECTION	AUTO-LOADERS

REVEALS THE MYSTICAL TRADE SECRETS OF THE C-64 A FREE DISK CONTAINING 21 UTILITY PROGRAMS IS INCLUDED. THIS BOOK IS WRITTEN FOR EVERYONE

VIDEO LOG $19.95

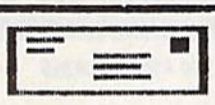
HAVE YOU EVER THOUGHT OF CATALOGING ALL THOSE MOVIES YOU HAVE BEEN SAVING ON VIDEO TAPE?

NOW YOU CAN DO THE JOB ON YOUR C-64 OR C-128. IN TRUE C-128 MODE, VIDEO LOG CAN HANDLE 2,000 FILMS OR 500 TAPES. THE C-64 VERSION ALLOWS FOR 1,000 TITLES OR 250 TAPES. A PRINTER IS NOT REQUIRED, BUT IF YOU HAVE ONE, PRINT COMPLETE CATALOGS OF YOUR LIBRARY OR LABELS FOR YOUR TAPES. LIST BY TAPE NUMBER OR FILM NAME. INFORMATION SAVED, TAPE NUMBER, FILM TITLE, COUNTER START AND END, LENGTH IN MINUTES, PLUS CATEGORY.

PLEASE STATE WHICH COMPUTER (C-64 OR C-128) PROGRAM YOU WANT, AS THIS ONE RUNS IN TRUE 128 MODE ALSO.

FOR THE C-64 & C-128

POSTAL CLERK



C-64 $19.95

KEEP IN TOUCH WITH CUSTOMERS, FRIENDS AND OTHERS. MAKE FULL USE OF BUSINESS LISTS. TURN MAIL LISTS INTO POWERFUL SELLING TOOLS. PRINTS TELEPHONE LISTS PLUS MAILING LABELS. 2,500 ENTRIES, AND SORTS BY NAME, CITY, STATE, & ZIP OR GROUP.

SUPER HELP C-64 $15.95

THE PROGRAMMER'S BEST FRIEND.....
1. POSTER SIZE (21X25) SCREEN & COLOR MAP. NEVER HUNT FOR THAT POKE AGAIN
2. C-64 MEMORY MAP, ONE OF THE MOST COMPLETE ON THE MARKET.
3. 18 BOUND REFERENCE CARDS. COMMANDS FOR DISK DRIVE, PRINTERS, & COMPUTER AT YOUR FINGER TIPS, GREAT FOR ANY LEVEL OF USER.

BRAND X C-64 $19.95



HAS YOUR DISK LIBRARY GROWN? CAN'T FIND A PROGRAM WHEN YOU WANT? BRAND X THE DISK CATALOGER CAN SOLVE THE PROBLEM. 4,000 ENTRIES/100 DISKS. ADD, SAVE, FORMAT, SCRATCH, ETC. IDENTIFIES 14 FILE TYPES. PRINTS LIST IN ONE, TWO OR THREE COLUMNS, PLUS LABELS. STOP DISK CONFUSION WITH BRAND X.

Circle 15 on Reader Service card.

COLOR MONITOR SALE!!!

Sale

16 COLORS

(Premium Quality)

- Built in Speaker & Audio
- For Video Recorders
- For Small Business Computers
- Apple - Commodore -Atari - Aplus 3000 -etc.
- One Year Free Immediate Replacement Warranty



(Premium Quality)

- Beautiful Color Contrast
- High Resolution
- Sharp Clear Text
- Anti-Glare Screen
- 40 Columns x 24 Lines
- Front Panel Controls

List $329.00

80 Columns **RGB** Super High Resolution

13" Color Computer Monitor

*C64/Atari composite cable $9.95
* C128 RGB/Composite 80 column cable $19.95.

Sale $159.95*

Add $14.50 Shipping

13" RGB & COMPOSITE COLOR MONITOR

Allows use of C-128 and C64 mode - composite and 80 column RGB mode. Must be used to get 80 columns in color with 80 column computers. Specially designed for use with the C128's special composite video output, plus green screen only option switch. (add $14.50 shipping)

List $399.00 **Sale $259.95***

12" MAGNAVOX (NAP) 80 COLUMN MONITOR

Super high resolution composite green screen monitor. 80 columns x 24 lines, easy to read, plus speaker for audio sound included. Fantastic value. Limited Quantities.

List $129.00 **Sale $79.95***

Turn Your Monitor into a TV Set Without Moving Your Computer

Elegant TV Tuner with dual UHF/VHF selector switches goes between your computer and monitor. Includes mute, automatic fine tuning and computer-TV selector switches. Inputs included for 300 ohm, 75 ohm, and UHF. Can be used with cable TV and VCR's. Fantastic Value. Limited Quantities.

List $129.95 **Sale $49.95***

15 Day Free Trial - 90 Day Immediate Replacement Warranty

• LOWEST PRICES • BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6¼% tax. Monitors must be shipped to Continental U.S. Only.
WE DO NOT EXPORT TO OTHER COUNTRIES. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & Availability subject to change without notice.
VISA — MASTER CARD — C.O.D.

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order

Circle 15 on Reader Service card.

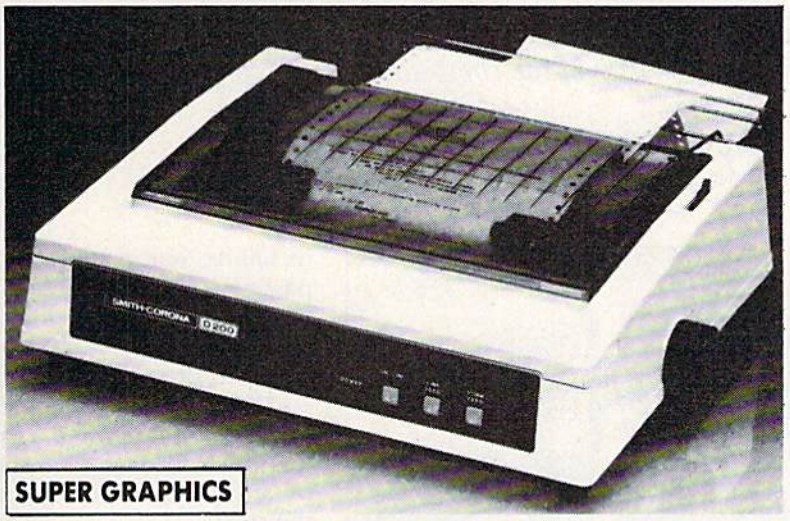
Famous Smith Corona National Brand

10" PRINTER SALE

Below Wholesale Cost Prices!!!

• ONE YEAR IMMEDIATE REPLACEMENT WARRANTY

- **Speed: 120 or 160 characters per second**
- **Friction Feed/Tractor Feed — Standard**
- **80 character print line at 10 CPI**
- **1 Line Buffer, 2K Buffer on 160 CPS Plus LQM**
- **Six pitches**
- **Graphics capability**
- **Centronics compatible parallel interface**
- **Features Bidirectional Print, Shortline Seek, Vertical And Horizontal Tabs**



SUPER GRAPHICS

This is a sample of our emphasized near-letter-quality print.

italic print. There is standard data processing quality print

Check These Features & Prices

120 CPS 10" Printer

List $429.00

SALE $159

160 CPS + Letter Quality Mode 10" Printer

List $499.00

SALE $199

SPECIFICATIONS

(IBM — Commodore)

Size/Weight
Height 5.04" Width 16.7"
Depth 13.4" Weight 18.7 lbs.
Internal Char. Coding
ASCII Plus ISO
Print Buffer Size
120 CPS: 132 Bytes (1 line)
120/160 CPS Plus LQM: 2K
No. of Char. in Char. Set
96 ASCII Plus International
Graphics Capability
Standard 60, 72, 120 DPI
Horizontal 72 DPI Vertical
Pitch
10, 12, 16.7, 5, 6, 8.3, Proportional Spacing
Printing Method
Impact Dot Matrix

Char. Matrix Size
9H x 9V (Standard) to 10H x 9V
(Emphasized & Elongate)
Printing Features
Bi-directional, Short line seeking, Vertical Tabs, Horizontal Tabs
Forms Type
Fanfold, Cut Sheet, Roll (optional)
Max Paper Width
11"
Feeding Method
Friction Feed Std.; Tractor Feed Std.
Ribbon
Cassette — Fabric inked ribbon
Ribbon Life
4 million characters

(Apple — Atari — Etc.)

Interfaces
Parallel 8 bit Centronics compatible
120/160 CPS Plus NLQ: RS232 Serial inc.
Character Mode
10 x 8 Emphasized; 9 x 8 Standard; 10 x 8 Elongated; 9 x 8 Super/Sub Script (1 pass)
Character Set
96 ASCII
11 x 7 International Char.
Line Spacing
6/8/12/72/144 LPI
Character Spacing
10 cpi normal; 5 cpi elongated normal; 12 cpi compressed; 6 cpi elongated compressed; 16.7 cpi condensed; 8.3 cpi elongated condensed; 5.12.5 cpi elongated proportional

Cartridge Ribbon — List $19.95. **Sale $12.95.**

Interfaces

IBM $89.00 **Apple $59.00** **Atari $49.95** **Commodore $39.95**

Add $14.50 for shipping, handling and insurance. Illinois residents please add 6¼% tax. Add $29.00 for CANADA, PUERTO RICO, HAWAII, ALASKA. APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days delivery. 2 to 7 days for phone orders. 1 day express mail! Prices & Availability subject to change without notice.
VISA — MASTERCARD — C.O.D. No C.O.D. to Canada or APO-FPO

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order

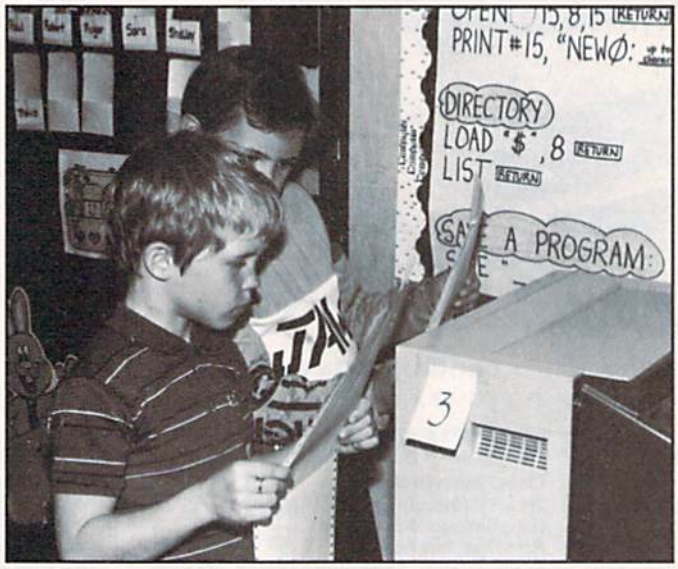
The C-64 Goes to Second Grade

Find out how one second-grade teacher is motivating her students to learn through creative uses of the computer.

By KAY GORE

When the classroom door opened after the 15-minute recess, David and Adam bolted past the teacher and headed for the Commodore 64. They pulled up chairs and sat down.

Adam twisted around in his seat and asked, "Can we work on anything we like, Ms. Hydrick?" The teacher nodded as she continued to hand out seat work to the rest of the class. David busied himself turning on the computer system and loading the word processor, Essay Writer, by Microcomputer Workshops Courseware (225 Westchester Ave., Port Chester, NY 10573).



The writing screen with the list of options appeared on the monitor. Adam carefully began to pick out the letters on the keyboard: "Once upon a time...," he paused, fingers hovered above the keys.

David, who had been sitting huddled over Adam's shoulder, brushed his friend's fingers aside and began slowly hunting for the letters on the keyboard while murmuring the words, "there was a prince...." Adam helped to direct his friend to the keys, making the typing a cooperative effort; it seemed as though a four-handed creature were composing the document rather than two seven-year-old boys.

"Hey, Corey, can we use your name?" David called across the classroom.

"Sure," answered Corey, not even looking up from his work.

"...named Corey," David mumbled as he typed.

One of the rules established early in the year was that the children had to ask permission if they used a classmate's name in their writing. The class continued this tradition when they started writing on the computer.

The boys both stopped typing, and Adam leaned back in his chair, distancing himself from the monitor. "Once a upon a time there was a prince named Corey...," he read aloud to David, who, face propped in hands, was reading the passage intently to himself.

"...and all the girls loved him," Adam finished the sentence. Both boys giggled.

"Let's say that Shannon loves Corey, 'cause she does," David suggested as a possible way to continue the story.

"If he is a prince, then he should love a princess, so we gotta say that a princess loves him," Adam argued.

"Not always," retorted David. "The girl can be a girl, but when she falls in love with the prince, she becomes a princess. A guy can't become a prince, but girls can become princesses real easy."

David started looking for the keys: "All of the princesses thought he was cute."

As David typed, Adam got up from the computer and walked over to where Shannon sat. "Hey, Shannon, is it all right if we use your name?"

"What are you going to use it for?" challenged Shannon.

"We are writing the story of a prince and a princess who are in love. Corey is the prince and we wanted you to be the princess. O.K.?"

"Yep," responded Shannon, grinning widely.

"Thanks," said Adam, and scooted back to the computer.

Sensational Prices!
. . . On Our Most Popular Items!

from microPal® . . .

THE 69¢ DISKETTE!

Are you paying too much for diskettes? Try our first quality, prime, 5¼" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; each box contains 5 shrink-wrapped 10-packs that include diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double density and work in either single or double density drives.

SS, DD Diskettes, Box of 50
32391 **$34.50**–69¢ ea.!

DS, DD Diskettes, Box of 50
32403 **$44.50**–89¢ ea.!

$ LOWEST PRICES IN U.S.A.! $

star MICRONICS INC.

BMC AXIOM INDUS
EPSON CARDCO

We can offer you some of the lowest prices in the country on the most popular printers, monitors and interfaces. Our normal prices are already low, but to make sure you get the best deal you can, we will also meet most competitive prices in this publication when placed on an equal basis *(Remember—we don't charge for use of your credit card, impose excessive shipping fees, or use any other hidden extras to boost the price you pay. Due to the rapid change in prices in the computer industry, we can only meet prices at the time you place your order; we cannot adjust prices on items ordered or shipped on an earlier date.)* Another plus for charge card customers — your charge card is billed at time of shipment only for the items shipped — no early billing, no long wait for the merchandise you already paid for.

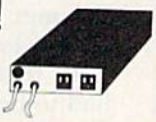
COMMODORE		**STAR MICRONICS**		**FAMOUS NAME SOFTWARE**
C-128 Computer	$CALL	SG-10	$CALL	Epyx
1571 Disk Drive	$CALL	SG-10C	$CALL	Broderbund
1902 Monitor	$CALL	**CARDCO**		Infocom
1670 Modem	$CALL	G-Wiz Interface	$CALL	Sierra
EPSON		S'MORE	$CALL	Timeworks
FX-85	$CALL	Super-G	$CALL	Random House
FX-286	$CALL			Activision, and many more!

★ THE BEST PRICES ★
★ THE BEST SERVICE ★
WHY SHOP ANYWHERE ELSE?

COMMODORE-READY PRINTER **ONLY $79.95!**
80-column dot-matrix printer includes direct plug-in cable (no other interface needed), 50 cps, tractor feed, prints upper/lower case, numerals, symbols and graphics. 1 year warranty by Epson. Sug. Retail $149.95
40733 **$79.95**
Supply limited! Order now!



POWER and PROTECTION FOR YOUR C-64!



POW'R PAK 64

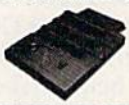
Pow'r Pak is a replacement power supply (1.5 amp) for the Commodore 64 . . . but that's not all! Pow'r Pak also supplies two additional surge protected outlets (120V) for monitor, disk drive, or other peripherals. On/off switch. Fuse protection. Sturdy all-metal casing is ventilated for heat dissipation. Full 1 year warranty.
34910 **$49.95**

OUR BEST MONITOR VALUE EVER! ★ $149.95 ★

The black matrix picture tube on this 14" composite color monitor provides impressive color over the entire spectrum: rich blacks, vivid colors and brilliant whites. The built-in audio speaker provides the best sound we've heard in a monitor of this size. Controls include volume, brightness, contrast, color, tint and sharpness. The warranty is unmatched . . . one year on parts and labor, two years on the picture tube! From Samsung. Supply Limited! Order Today!
40728 . . . . . **$149.95**
Monitor Cable (required). Works with C64, C128 (in composite mode), TI 99/4A and many others.
37424 . . . . . **$7.95**



CARTRIDGE EXPANDER



Plus $22.95 *FAST LOAD* OFFER!

Stop wearing out your computer by endless cartridge swapping! The Navarone cartridge expander features 3 cartridge slots. Select any cartridge, or the "off" position if no cartridge is to be used. Reset the computer independently of the power switch. Cartridge slots are vertical for easy access — no blind fumbling behind the computer.
33227 3-slot Cartridge Expander **$22.95**

The cartridge expander is a great companion for the Epyx Fast Load cartridge — you can keep it permanently installed plus have two sides free for other cartridges!
34216 Fast Load Cartridge (Sug. Retail $39.95) **$24.95**

Fast Load Only $22.95 with purchase of cartridge expander!

DUST COVER and "EVERYTHING BOOK" SPECIAL OFFER

Get to know us by ordering this great dust cover for your C-64 or C-128 and our catalog, "The Everything Book for the C-64 and C-128 Home Computers," for $2.95 (no extra shipping and handling charges). Cover is antistatic, translucent 8-gauge vinyl sewn to our exacting standards with reinforced seams. Discover the savings and easy shipping available from TENEX Computer Express!



$2.95

31627 C-64 Dust Cover and Catalog (R1S)
38464 C-128 Dust Cover and Catalog (R1S)

The Right Interface For All Your Printing Needs!!

PPI with graphics — *". . . a sound investment for your Commodore."* RUN, *Dec. '85* This high-performance graphics parallel printer interface from DSI for C-64 and VIC-20 emulates a Commodore printer. Comes with cables and user's manual.
33565 . . . . . **$39.95**

GMI Interface Built-in buffer provides super high-speed printing for parallel printers. Prints all Commodore characters. Cables and connectors included. From Cardco. Lifetime warranty.
34484 . . . . . **$CALL**

SUPER G This upgrade to the G-Wiz offers more speed, large buffer, accessible dip switches, and an 18" ribbon cable. From Cardco. Lifetime guaranty.
40502 . . . . . **$CALL**

From Your Friends At
TENEX Computer Express™

We gladly accept mail orders!
P.O. Box 6578
South Bend, IN 46660

Questions? Call
219/259-7051

Ad R1S

SHIPPING CHARGES

ORDER AMOUNT	CHARGE
less than $20.00	$3.75
$20.00–$39.99	4.75
$40.00–$74.99	5.75
$75.00–$149.99	6.75
$150.00–$299.99	7.75
$300 & up	8.75

MasterCard · American Express Card · VISA

NO EXTRA FEE FOR CHARGES
WE VERIFY CHARGE CARD ADDRESSES.
ORDER TOLL FREE
1-800-348-2778







David stopped typing so Adam could read: "Once a upon a time there was a prince named Corey and all of the princesses thought he was cute." Adam said the words slowly, as if weighing them to be sure each one belonged and was the best possible choice. "It's great," he said with a nod of his blond head.

David continued typing: "One of the princesses was named Shannon."

"Now what can happen?" Adam sighed.

"They lived happily ever after," David said with finality.

"O.K." Adam seemed satisfied, so both boys started looking for the keys. Once the story was complete, Adam pressed the keys to access the print menu; David got up and turned on the printer.

For these children, the computer has added another dimension to learning.

"O.K.?" Adam asked.

"Yep," answered David, assuring Adam that the paper was correctly positioned and that the printer's on-line light was on.

Adam pressed the return key without bothering to set any parameters until the printer started printing. Then Adam jumped out of his seat and joined David to watch the final product print out.

"Make one for me, Adam, and one for Ms. Hydrick," David instructed. "Me, too," chirped Shannon, who had left her seat to join the boys. So Adam restarted the process.

David and Adam were two proud authors who had gained a sense of writing as a collaborative effort, rather than as a solitary activity in which the writer wrestles alone with words. And writing *is* a collaborative effort in that the author must consider the reader.

A Classroom Companion

Here in Ms. Janie Hydrick's second-grade class in Mesa, Arizona, three Commodore 64s have created a writing environment where children learn to respect one another and gain insight into the complex web of interactions that the writer must consider. (As a follow-up exercise, the teacher reviews the story with the student and corrects spelling, punctuation, grammar, sentence structure, and so on.) The computer is also an integral part of class instruction, used to implement and enrich the curriculum.

Hydrick chose to use C-64s mainly because of their low cost; for the price of one Apple or IBM computer, she could buy three C-64s. As she puts it, "I can have at least six of my 28 students on the computers at one time, instead of just two with a more expensive brand."

With three computers in the classroom, Hydrick doesn't have to worry about being without a computer. If one develops a mechanical problem (or if a student who took the computer home over the weekend is out sick on Monday), Hydrick still has two.

"I feel sorry for those teachers who have only one computer," she says, "and one that is all too often highly sensitive to the unwitting abuse of young users. One problem with the computer can set their curriculum back two weeks. That's something I will never have to face with my Commodores."

In fact, in the two years Hydrick has had the computers—two years of hard use and being dragged home on weekends, holidays and during summer vacation—the computers have had no mechanical problems until recently, when one disk drive had to be fixed, at a cost of only $7. Since Hydrick purchased the computers herself and must maintain them with her own money, she appreciates their durability.

But Commodore computers are not just durable, inexpensive machines to this teacher. Hydrick says that even if the cost were higher, she would still choose the C-64 because of its wealth of software, some of which, such as SkyTravel and Just Imagine, runs only on the C-64. The machine's color, graphics and sound capabilities also help make it the computer of choice in the primary classroom.

As I was leaving the room, I paused by another C-64 to watch a group of five students building a database on Native Americans with MasterType's Filer. For these children, the computer has added another dimension to learning.

As Hydrick says, "Where else but with computers does a second-grader have power and control in his or her life?" These students selected their topic, researched it and were now in the process of creating a very valuable learning tool for their peers—all

without the teacher. For 28 second-graders at MacArthur Elementary School, the C-64 is a tool that reinforces their learning and helps them explore their world.

Classroom Lesson

If you would like to introduce your students to the power of the computer and enrich the learning environment in your classroom, here is an activity that Ms. Hydrick uses to introduce her students to major word processing concepts. This activity lets the children use all of the features of the word processor on a story written by the teacher. The students then follow up with a sequel or chapter of their own.

The teacher writes a brief, amusing story about three adventurous days in the lives of three children, but describes the days out of chronological order. She also includes a few sentences that do not belong in the story at all. She then saves the story on disk.

The students then go to work, retrieving the story from disk and editing it. When this is done, they write and edit a sequel, a fourth-day adventure, save it and print it out.

When the children edit the story, there are several editing techniques they can use, in whatever order they wish. For example, they can find and replace the names of the children in the story with any others they wish to use.

They must, of course, find and erase the sentences that do not belong in the story, and they also need to move blocks of text to rearrange the first, second and third days of the story in proper order. Finally, they must save the edited story to their own disks for future reference.

The children sometimes enjoy writing the fourth-day adventure in teams or small groups. They can then save this adventure to disk, exchange stories from disk to disk, combine stories and even print and bind volumes of fourth-day adventures.

In the process of editing, the young authors have taken great liberty with each other's texts, thus learning how to perform many editing tasks. They thus develop the knowledge and willingness to edit their own stories. R

Address all author correspondence to Kay Gore, School of Education, California State University, San Bernardino, 5500 University Parkway, San Bernardino, CA 92407.

MUST LIQUIDATE!
LIMITED SUPPLY of ULTRA FAMOUS
64K COMPUTERS
AT FAR BELOW DEALER COST!



- 64K Computer
- Disk drive
- ROM cartridge port
- COLOR monitor

ALL in ONE easy-to-carry system!

Carries easily as a suitcase! Plugs into 115V outlet!

ORDERS FILLED WHILE SUPPLY LASTS!

Factory Reconditioned with Factory Warranty!

THOUSANDS of programs available for business, education, personal home use!

Their 64K home computer is such a HUGE SUCCESS, the famous U.S. manufacturer decided to introduce this all-in-one TRANSPORTABLE model!

Sorry, we're NOT permitted to print the famous brand name. But we can provide additional details by phone: Toll-Free: 1-800-328-0609

FOR BUSINESS! Ideal entry level computer for word processing, data base, accounts payable/receivable, general ledger, payroll, inventory, tax accounting, spreadsheets, mailing lists . . . and much more!

FOR EDUCATION! Perfect for everyone from Ph. D. candidates to pre-school youngsters. A large selection of programs are available.

FOR HOME! Use for analysis of personal investments, income tax planning, household data . . . **AND** fast-paced arcade games! Can hook up to your TV with use of RF modulator (not incl.).

SNAP-ON COMPUTER: 64K RAM and 20K ROM. Full size typewriter keyboard with upper and lower case letters, numerals, symbols, reverse characters. 2 cursor control keys. 4 function keys, programmable to 8. Music synthesizer with 3 independent voices, each with range of 9 octaves. Input and output ports for: User, serial, ROM cartridge, 2 joysticks, external monitor, modem.

BUILT-IN DISK DRIVE: Intelligent, high-speed. 5¼" disk recorder. 170K formatted data storage; 35 tracks, 16K ROM. Uses single side, single density disks. Serial interface. Second port to chain second drive or printer.

BUILT-IN COLOR MONITOR: Color monitor displays 40 columns x 25 lines of text on 5" screen. High resolution, 320 x 200 pixels. 16 background and character colors.

BUILT-IN ROM CARTRIDGE PORT: Just slip in a ROM program cartridge. A huge variety of subjects are available.

Now available at FAR BELOW dealer cost of new models!

Original List Price $995.00

Liquidation Price Now Only **$388**

Item H-1134-3631-009 Ship. handling: $20.00

Sales outside continental U.S. are subject to special conditions. Please call or write to inquire.

Credit card customers can order by phone, 24 hours a day, 7 days a week VISA MasterCard

Toll-Free: 1-800-328-0609

TeleCheck Your check is welcome! No delays in orders paid by check.

C.O.M.B. Direct Marketing Corp.
Authorized Liquidator
14605 28th Ave. N. ● Mpls., MN 55441-3397

C.O.M.B. Direct Marketing Corp. Item H-1134
14605 28th Ave. N./Minneapolis, MN 55441-3397

Send ___ 64K Computer(s) Item H-1134-3631-009 at $388 each plus $20 each for shipping, handling. (Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check, thanks to TeleCheck.)

Charge to my: ☐ VISA® ☐ MasterCard®

Acct. No. _____ Exp. ___/___

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____

State _____ ZIP _____

Phone (___) _____

Sign here _____

Easy Disk-File Conversion

By KEN STANGE

Having trouble with your file formats? These C-64 utilities make translating between sequential and program files a breeze.

The average programmer uses two kinds of disk files: program and sequential. The essential difference between them is that Basic reserved words and commands, carriage returns, etc., are tokenized (abbreviated into one-byte code) in program files, whereas sequential files read just as ordinary text.

When you type a command such as Print and press the return key, the command is tokenized. It is the carriage return that initiates the tokenization. If you write a one-line program and, instead of pressing the return key, you cursor down, type RUN and hit the return key, nothing happens. This is because the leading line number and a carriage return are needed to enter a program line and tokenize the Basic commands in that line.

Because of tokenization, program files are stored in more compact form than sequential files. You cannot directly load a program file into a word processor or terminal buffer. If you could, you'd see an almost incomprehensible mixture of text and the odd characters that are the tokens, the codes, for the Basic commands.

Need for Sequential Files

You learn about program files as soon as you start computing, in connection with loading and saving programs, and they are, superficially, the easiest to manipulate. In some senses, however, sequential files are actually easier to use. The storage format is simpler, the manipulation of the contents easier and transportability greater.

To take advantage of these characteristics, there are times when it's helpful to translate program files into sequential files and then back again. Let's say you want to send a program to a friend via modem. Unless you have a terminal program (such as XMODEM, for example) that supports a standard protocol, sending the program as a sequential file, character by character, is sometimes the only way to accomplish it.

This involves de-tokenizing your program, and, once you've sent it as a sequential file, your friend will have to re-tokenize it. In other words, you need a way to translate, or convert, a program file into a sequential file and then back again.

Another need for this conversion arises in writing programs. If your word processor can read sequential files, polishing a program on the word processor is infinitely easier than doing so in the Edit mode. (You can't, of course, actively debug it. But you can easily renumber lines and otherwise fine-tune its structure.)

Also, unless you like to test every few lines of code as you write them, creating the first version of a program is easier with a word processor.

In working out a way to set up this conversion, I first investigated different methods of storing a program as a sequential file.

The easiest way involves using the technique of listing to a device other than the screen or printer, as a listing is simply a non-tokenized printout of a program. You can list to the disk drive, and the procedure is virtually the same as listing to a printer.

It's a bit unnerving when you do this for the first time, because the disk drive doesn't stop whirring after the file is written. The only cue that the listing is complete is the return of the blinking cursor to the screen.

Program File to Sequential File

Here are the instructions on converting a program file to a sequential

RUN It Right

C-64; C-128 (in C-64 mode)

Lyco Computer Marketing & Consultants



1091 . . . . . $228

SAVE ON THESE IN STOCK PRINTERS



SG-10 . . . . $205

PANASONIC
1091	228
3131 (NEW)	264
1092	325
3151	409
1080 (NEW)	209
1592 (NEW)	439

JUKI
Juki 6100	344
RS232 Serial Board	55
6100 Tractor	119
6100 Sheet Feeder	209
Juki 6300	757

C. ITOH
Prowriter 8510 sp+	Call
15505 sp+	Call
Printmaster	Call

LEGEND
808	148
1080	197
1380	224
1385	268

EPSON
LX80	209
FX85	333
JX80	Call
Homewriter 10	193
DX10	207
DX20	297
DX35	597
AP-80	244
HI-80	355
HS-80	298
FX-286 (NEW)	489
LQ-800 (NEW)	529
LQ-1000 (NEW)	659

BROTHER
HR-15XL-P	359
HR-15XL-S	359

SEIKOSHA
SP-1000 VC (C-64)	185
SP-1000 A Centronics	199
SP-1000 I IBM	199
SP-1000 AS RS-232	199
SP1000 AP Apple IIc	199
BP-5200 I	649
BP sheet feeder	199
SP-1000 ribbon	8.50
BP-5200 ribbon	12.50

CORONA
LP300	2495
200361 Toner Cartridge	89

SILVER REED
EXP400	249
EXP500	295
EXP550	399
EXP770	749

OKIDATA
Okimate 10	179
182	214
192	348
193	563

DIABLO
D25	549
630 API	1599
630 ECS	1759
D 80 1F	2395
P 32 CQ1	699
P 38	1749
C 150	999

STAR MICRONICS
SG-10	205
SG-10c	219
SG-15	367
SD-10	319
SD-15	438
SR-10	469
SR-15	578
SB-10	589
Powertype	297
NX-10 (NEW)	CALL
NB-15 (NEW)	CALL

CITIZEN
MSP-10	255
MSP-15	355
MSP-20	337
MSP-25	495
120D	188
Premier 35	429

COLOR RIBBONS NOW AVAILABLE!!

MONITORS

PANASONIC
DTH103 10" RGB Hi Res	395
TX12H3P 12" Color	419
TR120MBPA 12" Amber	109
TR122M9P 12" Green IBM	148
TR122MYP 12" Amber IBM	148

TEKNIKA
MJ-10 Composite	179
MJ-22	255

ZENITH
ZVM 122A Amber	75
ZVM 123G Green	75
ZVM 124 Amber IBM	129
ZVM 131 Color	275
ZVM 133 RGB	389
ZVM 135 Composite	449
ZVM 136 Hi Res Color	589
ZVM 1220	95
ZVM 1230	95
ZVM 1240	149

SAKATA
SG 1000 12" Green	99
SA 1000 12" Amber	109
SG 1500 12" Green TTL	119
SA 1500 12" Amber TTL	129
SC 100 13" Color Comp.	209
SC 200 13" RGB	389
STS1 Tilt Stand	29

COMMODORE
1902 Color	CALL
1802 Color	CALL

PRINCETON GRAPHICS
MAX-12 Amber	185
HX-12 RGB	469
SR-12 RGB	595

AMDEK
300 Green	118
300 Amber	128
310 Amber IBM	155
Color 300 Audio	234
Color 500 Composite	369
Color 600	397
Color 700	495
Color 710	569

THOMSON
CM36512V1	269
CM36632	159

MODEMS

COMMODORE
1670 Modem	155

SUPRA
1064 Modem (C-64)	49.95

INTERFACING

CARDCO
G-WIZ (C-64)	49
Super G (C-64)	54
C/?PS (C-64)	37

XETEC
Super Graphix 64	64
Super Graphix JR 64	45

DRIVES

INDUS
GT Atari	195
GT Commodore	195

COMTEL
Enhancer 2000 (C-64)	159

COMMODORE
1571	CALL
1541	CALL

DISKETTES

DENNISON
ELEPHANT 5¼" SSSD	11.99
ELEPHANT 5¼" SSDD	12.99
ELEPHANT 5¼" DSDD	14.99

VERBATIM
5¼" SSDD	13.99
5¼" DSDD	19.99

BONUS
5¼" SSDD	8.99
5¼" DSDD	12.99

COMMODORE
128	CALL
C 1571 Drive	CALL
C 1902-A	CALL
C-64	CALL
C 1541 Drive	CALL
C 1670 Modem	CALL
C-64 Computer	CALL
MPS801 Printer	LOW
C 1350 Mouse	42
C 1700 128K RAM	145
C 1750 512K RAM	269
JANE	35

BRODERBUND
The Print Shop	28.75
Graphics Library I, II, III	18.75
Karateka	19.75
Bank St. Writer	32.75
Lode Runner	21.75
Printshop Companion	*24.75*
Bank St. Speller	32.75
Bank St. Filer	32.75
Bank St. Mailer	32.75
Music Shop	*27.75*

MICROPROSE (C-64)
Kennedy Approach	21.75
Crusade in Europe	24.75
Decision in Desert	24.75
Solo Flight	20.75
Nato Commander	20.75
Spitfire Ace	18.75
F-15 Strike Eagle	20.75
Acrojet	21.75
Silent Service	21.75
Conflict in Nam	24.75
Gunship	21.75

SUBLOGIC
Night Mission Pinball	20.75
Flight Simulator	*31.75*
Jet Simulator	25.95
Football	NEW
Scenery Disk	EA. 14.95
Set 1-6	69.95

EPYX-64
Fastload	24.75
Summer Games	26.75

TOLL FREE 1-800-233-8760

MasterCard

TO ORDER

CALL TOLL FREE 1-800-233-8760
In PA **717-494-1030**
Customer Service **717-494-1670**

VISA

or send order to
Lyco Computer
P.O. Box 5088
Jersey Shore, PA
17740

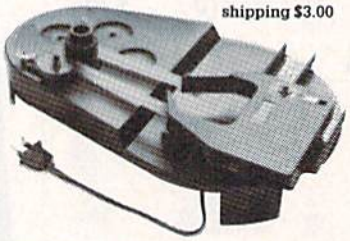
RISK FREE POLICY

In-stock items shipped within 24 hours of order. No deposit on C.O.D. orders. Free shipping on prepaid cash orders within the continental U.S. Volume discounts available. PA residents add sales tax. APO, FPO, and international orders add $5.00 plus 3% for priority mail service. Advertised prices show 4% discount for cash, add 4% for MasterCard or Visa. Personal checks require 4 weeks' clearance before shipping. Ask about UPS Blue and Red label shipping. All merchandise carried under manufacturer's warranty. Free catalog with order. All items subject to change without notice.

Circle 274 on Reader Service card.

MAC INKER™
Re-ink Any Fabric Ribbon
Automatically for less than 5 cents.

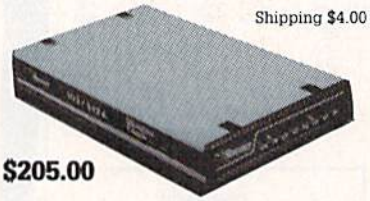
Dedicated Unit Starts at **$54.95**
Universal Cartridge MAC INKER **$68.50**
Universal Spool MAC INKER **$66.95**
shipping $3.00



Lubricated, Dot Matrix Ink
$3.00/bottle available in
black/brown/red/green/
yellow/purple/orange and gold.
Over 50,000 MAC INKER(s) in the field.
Over 7500 printers supported.

MERCURY MODEM
Really 100% Hayes* Compatible.
- 300/1200 baud.
- audio monitor/front panel lights.
- 8 months warranty.

Shipping $4.00



$205.00
*Hayes is a trademark of Hayes Microproducts.

DATA SWITCHES
All types, all lines switched, all metal, heavy duty switch, elegant design, best value for money.



2 Ports Parallel or Serial **$ 75.00**
4 Ports Parallel or Serial **$150.00**
2 Computers/2 Printers Parallel or Serial **$150.00**
We have cables too. Please inquire or specify at time of order.

Order Toll Free.
Call or write for free brochure.
1-800-547-3303
In Oregon 503-297-2321 (24 hours line)

Computer Friends®
6415 SW Canyon Ct., #10, Portland, OR 97221,
telex 4949559
Dealer inquiries welcome.

file. Note: Don't try to compress all of these commands into one line.

1. Load and list your program; then insert the disk on which you wish to write the program as a sequential file.
2. Type: OPEN15,8,15,"I" <return>
3. Type: OPEN8,8,8,"0:<filename>,S,W" <return> (Be careful not to use the same name as *any* kind of file on that disk.)
4. Type: CMD8:LIST <return>
5. When the cursor reappears, type: PRINT#8:CLOSE8:CLOSE15 <return>

If you check your disk directory at this point, you'll see that your program is now in sequential form, capable of being manipulated inside a word processor or sent to a friend via a modem.

Sequential File to Program File

The next step is the translation of the sequential file back into a program file, and it's a bit more complicated. It isn't very difficult to get the lines of the program on the screen, but in order to tokenize them, you have to press the return key after each line; and you must do this outside of the program.

The following program was written to make this chore automatic. By utilizing a technique called dynamic keyboard action, the computer can terminate a program, perform a task in Immediate mode and then reenter the program—all automatically. It is as if you are programming the computer to program itself.

For practical purposes, the program is very tightly packed, so it's difficult to read. However, for those interested in the techniques involved, which also have many other applications, I've included a detailed explanation of the code.

When you run the Tokenizer program, it automatically reads into memory the sequential file version of your program, tokenizes each line and, finally, erases itself. You are left with only your program stored in the computer, ready for saving and running in the usual manner.

Some Cautions

Take careful note of the following warnings when you're working with the Tokenizer program:

1. After typing in Tokenizer, save it before attempting to run it, because it self-destructs.

2. Tokenizer will not work with programs that are more than 19K or 76 blocks long, because it splits Basic RAM into two parts, one-half of which stores the tokenized program, and the other half the non-tokenized version.

3. The program that you're tokenizing cannot have any of the same line numbers as the Tokenizer program. If it does, make sure you change them before creating the sequential file.

Here are instructions on converting a sequential file to a program file.

1. Type: LOAD "TOKENIZER",8 and run it.
2. You will be prompted for the filename of the sequential file you are converting to a program file.
3. After you give it a filename, Tokenizer will read the sequential file into memory. This may take some time, so be patient. Then the program lines will appear, one by one, on the screen as the tokenization is performed. When all the lines have been tokenized, your converted file will be listed. You can then save it or run it.

Explanation of Tokenizer Program

Line 63000—Initializes outside-of-program counters to zero and resets top-of-Basic RAM to leave room for Poking in the ASCII values of the sequential file (top of memory is reset to 21504). It also sets a short delay loop.

Line 63001—Sets up screen format.

Line 63002—Asks for filename from user.

Line 63003—Opens file and checks for disk errors.

Line 63004—Reports any disk errors and then resets.

Line 63005—Counts the characters coming in. It also gets a character from the sequential file and sets the status variable. This line Pokes the ASCII value of the characters into sequential memory locations above the top-of-Basic memory and checks for the end-of-file marker. If the marker is not present, the line continues to read in characters and Poke them into memory.

Line 63006—If the end-of-file marker is found, this line closes communication with the disk drive, Pokes in an equals sign and a carriage return to mark in memory the end of the file. (An equals sign would never normally occur before a carriage return in a functional program.) It also returns the cursor to the correct position for dynamic keyboard reading and starts the following loop.

Line 63007—This is the beginning of the loop that prints line numbers

Circle 82 on Reader Service card.

While driving deep into the Black Forest of Germany, our slow and unreliable Volkswagen just started sputtering and then to our dismay, quit running. After hours of unrelentlous tinkering, we were ecstatic to see a strange little creature, known as Hacker Gnome, emerge from behind a tree. Using his infinite wisdom and wizardry he fixed our poor bug and got us speedily on our way. Well, we were so impressed with Hacker Gnome's wizardry, that we convinced him to reveal his secrets for speed and reliability. And we are passing these secrets along to you so that you can write the very best Basic Programs.



Introducing **GNOME *SPEED***

The Basic 7.0 Compiler for your Commodore 128

GNOME SPEED will transform virtually any Basic Program into a compiled version that is as sophisticated as if it were originally written in machine code. Your compiled program will run up to ten times faster and will be up to 50 percent smaller. And GNOME SPEED will inform you of any coding errors so that your final program is error-free.

NO COPY-PROTECTION! The price? Just $59.95 (U.S.)

U.S.A. Mail Orders
SM Software, Inc.
P.O. Box 27
Mertztown, PA
19539
1-215-682-4920

Canadian Mail Orders
The Transactor
1-416-878-8438

Dealer Inquiries
Micro-Pace, Inc.
1-217-356-1884

SM SOFTWARE, INC.

Circle 202 on Reader Service card.

GREAT PRODUCTS FOR YOUR COMMODORE

promenade C1™

The Eprom Programmer. Thoughtfully designed, carefully constructed, the *promenade* C1™ is respected around the world for quality and value. The original software controlled programmer does away with personality modules and switches. Intelligent programming capability can cut programming time by 95%! With Disk Software ..... still just $99.50

CAPTURE™

Take control of your '64 or '128* with this easy to use cartridge. Lets you make a back-up disk of your memory-resident software. Your program is then fully accessible to you and your program can be re-booted from your disk 3-5 times faster. Or make an auto-starting cartridge using the *promenade* C1 and a CPR cartridge kit. Its magic!

CAPTURE™ is a bargain at 39.95

CARTRIDGE MATERIALS:

CPR-3 - Three socket board, case and 3 eproms, for use with **CAPTURE™** 29.95
PCC2 - Two 2732 (4K) or 2764 (8K) eproms. For '64 or '128 in 64 mode 4.95
PCC4 - Four sockets for 2764, 27128 or 27256 (32K) eproms. Bank switching 17.95
PCC8 - Like the PCC4 but twice the capacity. For multiple programs 29.95
PRB4 - Four sockets, eprom & battery backed RAM combination 24.95
PTM2 - Basic 128 mode cartridge board. Two 2764 or 27128 eproms ..... 5.95†
PTM4 - Four sockets, 27128 & 27256 eproms. 128 mode bank switcher ..... 19.95†
PCCH2 - Plastic case for above cartridges (except PCC8) 2.25
Eproms - Always in stock at competitive prices.

†available June '86.
*when in 64 mode.

EPROM ERASERS:

Datarase - Hobbyist eprom eraser, 2 at a time, 3 to 10 minutes 34.95
PE14 - Industrial quality eraser, 7 to 9 at a time 79.95
Starter Set - **CAPTURE™**, *promenade* C1 and one CPR3 kit 149.95
Deluxe Set - **CAPTURE™**, *promenade* C1, Datarase and two CPR3 kits 199.95

SHIPPING & HANDLING: USA - UPS SURFACE $3.00 FOREIGN (AIR MAIL ONLY) $13.00

JASON-RANHEIM
1805 INDUSTRIAL DRIVE
AUBURN, CA USA 95603

TO ORDER TOLL FREE 800-421-7731
FROM CALIFORNIA 800-421-7748
TECHNICAL SUPPORT 916-823-3284
FROM OUTSIDE USA 916-823-3285
MC, VISA, AMEX WELCOME

from the beginning of this program up to and including this line, so that dynamic keyboard action can delete them. It also prints a statement telling you to run the second part of the program, which will be started by dynamic keyboard action. In addition, this line sets up the keyboard buffer size and starts the loop that Pokes in carriage returns. Finally, it ends this section of the program and initiates dynamic keyboard action.

Line 63008—Positions the cursor for dynamic keyboard action.

Line 63009—Counts, using outside-of-program counters.

Line 63010—Resets the part of the counter that registers numbers 1–100.

Line 63011—Checks value of character stored in a specific memory location. If that character is not a carriage return, printing continues.

Line 63012—If that character *is* a carriage return, this line checks to see if it is the end-of-program marker (equals sign). If so, the cursor is positioned for dynamic keyboard action. This line also begins the loop that prints line numbers for the remainder of the program. Finally, execution goes to line 63014.

Line 63013—If the character is *not* an equals sign, this line prints a statement telling you to run the program again and resets the keyboard buffer range. This line also begins the loop that Pokes in carriage returns. After the loop is executed, dynamic keyboard action is initiated, tokenizing the line from the sequential file and restarting.

Line 63014—Returns the computer to normal configuration.

Line 63015—Prints LIST, positions the cursor for dynamic keyboard action and sets the buffer range. It also begins the loop that Pokes in carriage returns. After the loop is executed, the program ends with dynamic keyboard action erasing the remainder of the Tokenizer program and listing the tokenized program to the screen. R

Address all author correspondence to Ken Stange, 970 Copeland, North Bay, Ontario, Canada P1B 3E4.

Listing 1. *The Tokenizer program.*

```
63000 POKE826,0:POKE827,0:POKE52,84:POKE56,
      84:CLR:FORI=1TO5000:NEXT:CLR :REM*120
63001 PRINT"{SHFT CLR}{CTRL 2}{CRSR DN}SEQ
      TO PRG FILE CONVERTER - K. STANGE":PO
      KE5328Ø,2:POKE53281,2          :REM*29
63002 INPUT"{4 CRSR DNs}{CTRL 8}FILE TO BE
      CONVERTED";NA$:PRINT"{3 CRSR DNs}NOW
      READING THE FILE... "          :REM*170
63003 OPEN15,8,15,"I":OPEN8,8,8,"0:"+NA$+",
      S,R":INPUT#15,EN,ER$,ET,ES     :REM*155
63004 IFEN<>0THENPRINT"DISK ERROR: ";ER$:CL
      OSE8:PRINT#15,"I":CLOSE15:RUN:REM*108
63005 C=C+1:GET#8,A$:RS=ST:POKE2151Ø+C,ASC(
      A$):IFRS<>64THEN63005          :REM*183
63006 CLOSE8:POKE2151Ø+C+1,61:POKE2151Ø+C+2
      ,13:PRINT"{SHFT CLR}{2 CRSR DNs}":FOR
      I=63000TO63007                 :REM*52
63007 PRINTI:NEXT:PRINT"RUN63008{HOME}";:PO
      KE198,1Ø:FORI=631TO64Ø:POKEI,13:NEXT:
      END                            :REM*219
63008 PRINT"{SHFT CLR}{2 CRSR DNs}":CLR
                                     :REM*180
63009 C=(PEEK(826)*1ØØ)+PEEK(827)+2151Ø
                                     :REM*79
63010 IFPEEK(827)=1ØØTHENPOKE826,(PEEK(826)
      +1):POKE827,Ø                  :REM*50
63011 POKE827,(PEEK(827)+1):PRINTCHR$(PEEK(
      C));:IFPEEK(C)<>13THEN63009    :REM*39
63012 IFPEEK(C-1)=61THENPRINT"{SHFT CLR}{2
      CRSR DNs}":FORI=1TO8:PRINT63007+I:NEX
      T:GOTO63014                    :REM*244
63013 PRINT"{3 CRSR DNs}GOTO63008{HOME}";:P
      OKE198,1Ø:FORI=631TO64Ø:POKEI,13:NEXT
      :END                           :REM*131
63014 POKE826,Ø:POKE827,Ø:POKE52,16Ø:POKE56
      ,16Ø:CLR                       :REM*86
63015 PRINT"LIST{HOME}";:POKE198,1Ø:FORI=63
      1TO64Ø:POKEI,13:NEXT:END       :REM*11
```

Manuscripts: Contributions in the form of manuscripts with drawings and/or photographs are welcome and will be considered for possible publication. Article text and any accompanying programs should be submitted on disk as well as in hard-copy form. *RUN* assumes no responsibility for loss or damage to any material. Please enclose a self-addressed, stamped envelope with each submission. Unsolicited manuscripts that cannot be accepted will be returned only if accompanied by an appropriately sized, adequately stamped, self-addressed envelope. Payment for the use of any unsolicited material will be made upon acceptance. All contributions and editorial correspondence (typed and double-spaced, please) should be directed to *RUN* Editorial Offices, 80 Pine Street, Peterborough, NH 03458; telephone: 603-924-9471. **Advertising Inquiries** should be directed to Advertising Offices, CW Communications/Peterborough, Inc., Elm Street, Peterborough, NH 03458; telephone: 800-441-4403. **Subscription problems or address changes:** Call 1-800-645-9559 or write to *RUN*, Subscription Department, PO Box 954, Farmingdale, NY 11737. **Problems with advertisers:** Send a description of the problem and your current address to: *RUN*, Elm Street, Peterborough, NH 03458, ATTN.: Barbara Harris, Customer Service Manager, or call 1-800-441-4403.

RUN is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina*; Asia's *Asian Computerworld*; Australia's *Computerworld Australia*, *Australian PC World* and *Macworld*; Brazil's *DataNews* and *PC Mundo*; China's *China Computerworld* and *China Computerworld Monthly*; Denmark's *Computerworld/Danmark*, *PC World* and *RUN* (Commodore); Finland's *Mikro*; France's *Le Monde Informatique*, *Golden* (Apple), *OPC* (IBM), *Theoreme* and *Distributique*; Germany's *Computerwoche*, *Infowelt*, *PC Welt*, *Computer Business* and *RUN*; Hungary's *Computerworld Informatika*; Italy's *Computerworld Italia* and *PC Magazine*; Japan's *Computerworld Japan*; Mexico's *Computerworld/Mexico*; The Netherland's *Computerworld Netherlands* and *PC World*; Norway's *Computerworld Norge* and *PC Mikrodata*; Spain's *Computerworld España*, *PC World* and *Commodore World*; Sweden's *ComputerSweden*, *Mikrodatorn* and *Svenska PC World*; Switzerland's *Computerworld Schweiz*; The United Kingdom's *Computer News*, *PC Business World* and *Computer Business*; Venezuela's *Computerworld Venezuela*; the U.S.'s *AmigaWorld*, *Computerworld*, *inCider*, *Infoworld*, *MacWorld*, *Micro Marketworld*, *PC World*, *RUN*, *73 Magazine*, *80 Micro*, *Focus Publications* and *On Communications*.

The RUNning Board

RUN invites you to contact its bulletin board (RUNning Board). In addition to up-to-date information about *RUN* and the Commodore industry, the RUNning Board now presents useful computing hints and tips, corrections and updates to published articles, user's group information, an up-to-date list of selections for ReRUN and sneak previews of upcoming articles.

The RUNning Board also features a menu format that makes it easier and faster for you to select a specific section of the bulletin board. We use a standard protocol, 300 baud, one stop-bit, no parity, full duplex and a word length of eight bits.

The RUNning Board is definitely worth a call. You can get on-line anytime, 24 hours a day, seven days a week, by dialing our new number: 603-924-9704.

FOR COMMODORE 128 AND C-64 OWNERS ONLY:

This is just 1 of 15 pages of the newest and biggest Skyles catalog, hot off the press.

We know you'll want this page, in its full 8½ x 11 splendor, and another 14 pages of peripherals, software and books that will make your Commodore 128 or C-64 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
231E South Whisman Road
Mountain View, CA 94041

From Skyles Electric Works, the oldest and largest professional specialists in the business.

QUICKSILVER 128™

Now Available For C-128



Is the fastest IEEE-488 interface available for the Commodore 128. How fast? As fast as the external IEEE-488 device will allow. For example, a program or file will load over four times faster from a Commodore 4040 or 8050 disk drive as compared to a 1541 disk drive. QUICKSILVER 128 loads 5 times faster than a serial MSD drive. When used with printers speed is only limited by the printer. QUICKSILVER 128 is transparent. Almost all programs will not occupy any program memory. Almost all programs work QUICKSILVER 128. A word processor is completely compatible with QUICKSILVER 128. A word processor is completely compatible with QUICKSILVER 128, and some IEEE disk drives have different formats, and programs are not going to load. Some disk by various operations in the 1541 will not load on non-1541 QUICKSILVER 128 is cartridge

horizontal, cartridge port extender. Easy to locate your IEEE device within 6 feet of QUICKSILVER 128 using the built-in 6 foot IEEE cable. Easy to select which device numbers you want QUICKSILVER 128 to interface to the IEEE bus. Easy to use with almost all programs. Easy to buy, at an amazingly low price, from Skyles Electrics Works or your local dealer.

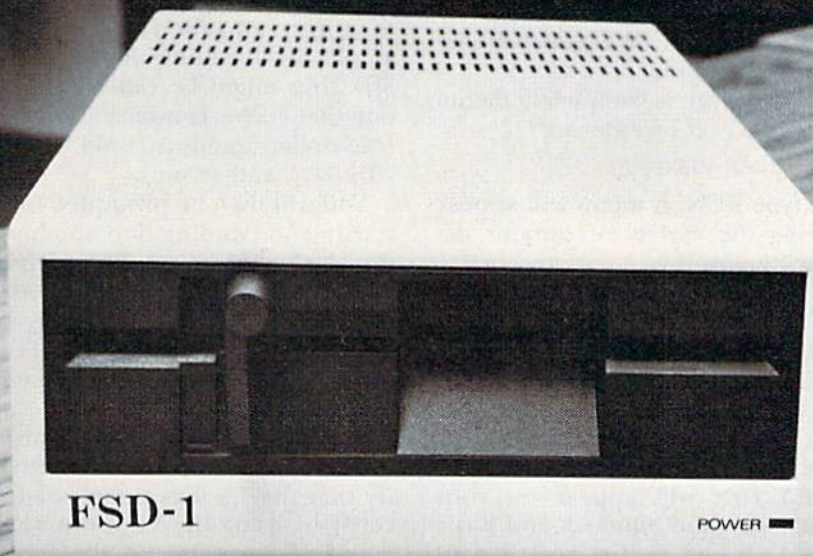
	SUMMER SALE
ER 128, C-128 Cartridge	$119.95
A Cartridge	99.95

Commodore Compatible

Directly replaces the Commodore 1541 disk drive.

FSD-1 5¼"Disk Drive

$139



Special Features

- Full 6 month warranty—your assurance of quality
- Slim line construction—to fit in those smaller places
- Vented metal chassis—to run cool and efficient always
- Dual serial port with chaining option for expandability
- 5¼" industry standard format
- Positive lever lock—to eliminate the "pop out" problem
- Built especially for C-64 users

To Order call toll free
1-800-356-5178

Visa and MasterCard are welcome. Allow $8.00 shipping and handling. Or mail your order with check or money order to:

The FSD-1 Disk Drive is a versatile and efficient disk drive built for the Commodore series of personal computers. This disk drive is fully compatible with the Commodore 64 computer and directly replaces the Commodore 1541 Disk Drive, giving much better performance in terms of data loading and writing speed and memory buffer size.

ECI

Emerald Component International
541 Willamette Street
Eugene, OR 97401
Tel. 503-683-1154

Quick Merge!

By RICHARD De A'MORELLI

If you write your own Basic programs or utilities, you've probably developed several useful subroutines that you frequently want to include in new programs.

For instance, you may have a subroutine that checks the current cursor position to prevent scrolling; another that produces a beep and requests user input; and perhaps another that sets up and Pokes values to your computer's sound chip. The possibilities are endless.

If you write your own programs, you know that the process of typing in Basic lines, checking for typos and debugging is time-consuming and tedious. And having to retype those same lines, again and again, whenever you want to include them in a new program, is even more tiresome.

Wouldn't it be nice if you never had to type, proofread and debug your favorite subroutines more than once; if you had a master program containing dozens of program modules that you could access in a few seconds with just a few keystrokes?

Well, Quick Merge will give it to you!

With this easy-to-use utility, you type in your favorite subroutines only once and save them to disk. You can then, within seconds, retrieve or merge them into any program you're writing.

Save yourself the trouble of retyping your handy subroutines by letting your computer and disk drive do all the work.

How to Use Quick Merge

Quick Merge works by saving blocks of Basic program lines in the form of sequential files. Through a process that utilizes the C-64's dynamic keyboard feature, you can then easily recall those files and merge them into whatever program you're writing. You don't have to contend with any Peeks and Pokes or remember any memory locations.

Quick Merge is completely menu-driven. Load it by entering

```
LOAD"QUICK MERGE",8
```

then type RUN. A menu will appear offering the variety of options described below.

Program Options

The first option, View File, lets you examine any existing Quick Merge file. (Of course, the file you select must be on the disk currently in the drive, or a File Not Found error will result.) Text will appear on your screen with line numbers and Basic commands, just as if you were viewing an actual program listing. When the end-of-file marker is reached, you'll be returned to the main menu.

Please note that Quick Merge filenames are always preceded by a slash (/). For instance, a subroutine named "Tones" would actually be saved as "/Tones". (You needn't enter the slash; the computer adds it automatically.) This makes it easy to distinguish these files from others on a disk.

The second option, Save File, lets you save any selected block of program lines currently in memory. Before using this option, you must type in some of your own program lines using option #10 (Write New Program).

You'll then be prompted for a unique filename (up to 15 letters). Always try to assign names that are descriptive of a file's content. For example, a subroutine that sets up the SID chip might be called "/Sound"; one that converts numeric strings to true dollar amounts could be called "/Dollar", and so on.

You will then be prompted for the starting and ending line numbers of the block to be saved. The computer checks to ensure that the filename you've chosen does not already exist on your disk. If everything is all right, the program will save, in a sequential file, the program lines you've indicated. When the process is finished, the menu will reappear. You can verify that the file has transferred correctly by using the View option and entering the name of the file just created.

When using Save, you are limited

RUN It Right

C-64; C-128 (in C-64 mode)
Disk drive

First, load and run Quick Merge. Next, select menu option 10 (Write New Program). Quick Merge will terminate, and brief instructions will appear on the screen.

In Direct mode, type whatever program lines you wish to enter, making sure your line numbers remain below 63900.

For example:

```
10 "{SHFT CLR}HELLO!"
20 PRINT"THIS CREATES A DEMO FILE"
30 PRINT"WHAT IS YOUR NAME?":INPUT N$
40 PRINT"THANK YOU,";N$
50 END
```

Still in Direct mode, type RUN 63900 to reactivate Quick Merge. Choose menu option 2 (Save File), and you'll be prompted to enter a filename. Type "DEMOFILE" as the filename.

In this example, when prompted, type 10 as the starting line number and 50 as the ending line number.

A Quick Merge program file will now be created and stored on disk. After a few moments, the menu will reappear. Select menu option 7 (Directory), and you'll see that a new file called "/DEMOFILE" has been created.

Once a Quick Merge file has been created, you may use any of the other menu commands to view, edit, merge, copy to another disk, print, etc.

Next, select menu option 11 (Exit to Basic) and delete lines 10–50. Type RUN 63900 to restart Quick Merge.

Select menu option 3 (Merge).

Type "DEMOFILE" as the file to be merged.

The file will be displayed on the screen as it is read into memory. When the last character has been read, the number of bytes in the file will be displayed.

Each program line in the file will now flash rapidly on the screen as it is merged into the Quick Merge program. When the final line has been merged, the menu will reappear.

Finally, select menu option 11 again and list lines 10–50. You'll see that they are merged into Quick Merge. You could just as easily have merged a hundred lines or a dozen different program modules!

Table 1. *Example of how to use Quick Merge.*

to a maximum file length of 4096 characters. There is no limit to the number of actual program lines that can be saved.

The third option, Merge, is not merely an Append utility; rather, it achieves true merging of program modules into whatever master program is currently in memory. You'll be asked to enter the name of the file to be merged, and the rest is automatic.

The computer ensures that the specified file exists. If it does, it is displayed on the screen while being read into memory. Actually, the file does not consume any Basic memory: It is Poked as ASCII characters into the 4K bank of free RAM at address range 49152–53247. As each program line appears on the screen, it is automatically merged into your existing program.

This Merge feature is a wonderful, time-saving convenience; but bear in mind that program lines loaded from the new file will overwrite any existing lines having the same number in the current program. Therefore, I suggest that you first view the file to make sure line numbers in that block do not duplicate existing lines. If necessary, change line numbers in your main program so they won't be overwritten.

When the merge is complete, you can exit to Basic and list your program; you will see that the new lines have actually been mixed into the original program! In this manner, you can merge as many of your favorite subroutines as you wish and, within minutes, build an elaborate program containing hundreds or even thousands of bytes, without ever typing a single Basic line or having to proofread or debug a single command!

Once you've begun assembling a library of program files, the Rename menu option permits you to update filenames. You'll be prompted for the old and new filenames, and the file will be renamed accordingly.

When you no longer want a program file, use the Erase option and type the name of the program to be erased. It will be permanently deleted from disk.

If you rewrite an existing file and want to save it in place of the old version, the Rewrite option will do it automatically.

The Directory option will display any disk directory without disturbing the current program in memory. This is helpful when you are searching for a file or when you can't remember the filename you assigned to a program module.

The Duplicate option is a handy feature that lets you copy any Quick Merge sequential file from one disk to another. You'll be prompted for the filename to be copied, and it will be read into memory. You will then be told to insert the destination disk. An exact copy of the original file will be duplicated on the second disk.

The Print option is a convenient feature that sends to your printer the contents of any Quick Merge file. The file is also displayed on the screen as it is printed. When the end-of-file marker is reached, the main menu will reappear.

The Write New Program is the option you must use before actually saving a Quick Merge file. It temporarily halts Quick Merge, and you will be instructed to type in your program lines. When finished, check your typing accuracy and then reactivate Quick Merge with RUN 63900. You can now use the Save option to create a permanent Quick Merge file of the program lines you just entered, and you'll never have to type those lines again!

Quick Merge has high line numbers, (63900–63999), so as not to interfere with the assembly of your main program. When writing or merging program modules, just be sure to keep your Basic line numbers below 63900. R

Address all author correspondence to Richard De A'Morelli, 9161 Beachy Ave., Arleta, CA 91331.

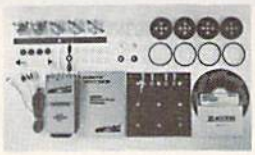
Listing 1. *Quick Merge program.*

```
639ØØ REM *** QUICK MERGE ***          :REM*171
639Ø1 OPEN15,8,15:POKE53281,1:POKE5328Ø,Ø:I
      FM$(Ø)<>""THEN639Ø7              :REM*166
639Ø2 RESTORE:FORX=ØTO1Ø:READM$(X):NEXT
                                       :REM*1
639Ø3 DATA"1> VIEW FILE","2> SAVE FILE","3>
       MERGE FROM DISK","4> RENAME     :REM*78
639Ø4 DATA"5> ERASE","6> REWRITE FILE","7>
      DIRECTORY","8> DUPLICATE"        :REM*237
639Ø5 DATA"9> PRINT","{CRSR LF}1Ø> WRITE NE
      W PROGRAM","{CRSR LF}11> EXIT TO BASI
      C"                               :REM*236
639Ø7 PRINTCHR$(142)"{CTRL 7}{SHFT CLR}{CRS
      R DN}{2 SPACEs}{CTRL 9}QUICK MERGE ME
      NU {CTRL Ø}{CRSR DN}":FORX=ØTO1Ø:PRIN
      T"{2 SPACEs}"M$(X):NEXT          :REM*158
639Ø8 PRINT:INPUT"{2 SPACEs}SELECT";K$:K=VA
      L(K$):F$="{CTRL 9}NONE":IFK<1ORK>11TH
      EN639Ø7                          :REM*23
639Ø9 IFPEEK(679)THENF$="":FORX=68ØTO68Ø+PE
      EK(679)-1:F$=F$+CHR$(PEEK(X)):NEXT
                                       :REM*24
6391Ø IFK=4ORK=7ORK>9THEN63912         :REM*45
63911 PRINT"{CRSR UP} FILE{SHFT SPACE}IN{SH
      FT SPACE}RAM: "F$"{2 CRSR DNs}":INPUT
      " FILE NAME: ";F$:GOSUB63917     :REM*242
63912 ONKGOTO6392Ø,6393Ø,6394Ø,63913,63915,
      63915,6397Ø,6392Ø,6392Ø,63998,63999
                                       :REM*99
63913 INPUT"OLD NAME ";F$:INPUT"CHANGE TO";
      FX$:GOSUB63917                   :REM*66
63914 F$="RØ:"+FX$+"="+F$:PRINT#15,F$:GOSUB
      63996:GOTO639Ø7                  :REM*195
63915 PRINT:GOSUB63917:PRINT#15,"SØ:"+F$:IF
      K=5THEN639Ø7                     :REM*42
63916 GOTO6393Ø                        :REM*189
63917 IFLEFT$(F$,1)<>"/"THENF$="/"+F$:POKE6
      79,LEN(F$)                       :REM*246
63918 IFK=4THENIFLEFT$(FX$,1)<>"/"THENFX$="
      /"+FX$                           :REM*1
63919 FORX=68ØTO68Ø+PEEK(679):POKEX,ASC(MID
      $(F$,X-679,1)+CHR$(Ø)):NEXT:RETURN
                                       :REM*11Ø
6392Ø PRINT"{SHFT CLR}FILE: "F$:GOSUB63995:
      IFK=8THENCH=Ø:PRINT"TRANSFERRING FILE
      ..."                             :REM*23
63921 IFK=9THENCLOSE4:OPEN4,4,7        :REM*12Ø
63922 GET#2,K$:IFK=9THENL$=L$+K$:IFK$=CHR$(
      13)THENPRINT#4,L$;:L$=""         :REM*2Ø7
63923 IFK=8THENCH=CH+1:POKE49151+CH,ASC(K$+
      CHR$(Ø)):GOTO63925               :REM*58
63924 PRINTK$;:IFPEEK(214)>22ANDK$=CHR$(13)
      THENGOSUB6399Ø:PRINT"{SHFT CLR}"
                                       :REM*69
63925 IFST=.THEN63922                  :REM*168
63926 IFK=9THENPRINT#4,L$:PRINT#4:CLOSE4:GO
      TO63929                          :REM*45
63927 IFK=8THENPRINT"INSERT TARGET DISK":CL
      OSE2:GOSUB63991:OPEN3,8,3,F$+",S,W"
                                       :REM*162
63928 IFK=8THENGOSUB63996:FORX=1TOCH:PRINT#
      3,CHR$(PEEK(49151+X));:NEXT:CLOSE3
                                       :REM*5
63929 PRINT"-END-":Q=-1:GOTO6399Ø      :REM*112
6393Ø INPUT" SAVE FROM LINE#";LS:INPUT" TO
      LINE#{7 SPACEs}";LF:IFLF=<LSTHEN639Ø7
                                       :REM*25
63932 F$=F$+",S,W":GOSUB63995:PRINT"{CTRL 2
      }{SHFT CLR}CMD2:LIST"LS"-"LF      :REM*51
63933 PRINT"{2 CRSR DNs}PRINT#2:CLOSE2:RUN6
      39ØØ":PRINT"{3 CRSR DNs}{CTRL 7}SAVIN
      G...{CTRL 2}"                    :REM*92
63934 POKE631,19:FORZ=632TO635:POKEZ,13:NEX
      T:POKE636,8:POKE198,6:END        :REM*11
6394Ø GOSUB63995:PRINT"{SHFT CLR}READING: "
      F$:BANK=49152                    :REM*2Ø1
63946 GET#2,K$:IFSTTHEN63954           :REM*121
63947 PRINTK$;:POKEBANK+LOC,ASC(K$):LOC=LOC
      +1:IFLOC<4Ø96THEN63946           :REM*68
63948 PRINT:PRINT"{CTRL 9}FILE OVERFLOW":Q=
      -1:GOTO6399Ø                     :REM*2Ø3
63954 CLOSE2:PRINT"-END-":PRINT"{CRSR DN}ME
      RGING "LOC-2"BYTES -- WAIT!"     :REM*51
63956 POKE1Ø2Ø,INT(BANK/256):POKE1Ø21,BANK-
      (PEEK(1Ø2Ø)*256)                 :REM*183
63957 LOC=LOC+BANK:POKE1Ø22,INT(LOC/256):PO
      KE1Ø23,LOC-(PEEK(1Ø22)*256)      :REM*88
63958 FORT=1TO1ØØØ:NEXT:PRINT"{SHFT CLR}";
                                       :REM*89
6396Ø BANK=(PEEK(1Ø2Ø)*256)+PEEK(1Ø21):LOC=
      (PEEK(1Ø22)*256)+PEEK(1Ø23)      :REM*143
63961 FORX=BANK TO LOC:PRINTCHR$(PEEK(X));:
      IFPEEK(X)<>13THENNEXT:RUN639ØØ
                                       :REM*136
63963 X=X+1:POKE1Ø2Ø,INT(X/256):POKE1Ø21,X-
      (PEEK(1Ø2Ø)*256)                 :REM*4
63964 IFPEEK(1Ø24)<48ORPEEK(1Ø24)>57THEN639
      6Ø                               :REM*253
63965 PRINT"{HOME}{5 CRSR DNs}{CTRL 2}G{SHF
      T O}6396Ø{CTRL 7}{HOME}";:POKE631,19:
      POKE632,13:POKE633,19            :REM*16Ø
63966 FORY=634TO638:POKEY,17:NEXT:POKE639,1
      3:POKE198,9:END                  :REM*53
6397Ø REM---DIRECTORY                  :REM*2Ø9
63971 CLOSE2:OPEN2,8,Ø,"$Ø":PRINT"{SHFT CLR
      }":GET#2,X$,X$                   :REM*124
63972 GET#2,X$,X$,X$,Y$:C=ASC(X$+CHR$(Ø))+A
      SC(Y$+CHR$(Ø))*256               :REM*19
63974 GET#2,Y$:IFSTTHENPRINT:PRINT"{2 CRSR
      UPs}{7 CRSR RTs}BLOCKS FREE":Q=-1:GOT
      O6399Ø                           :REM*37
63975 GET#2,Y$:IFY$=CHR$(32)ORY$=CHR$(34)TH
      EN63975                          :REM*74
63979 Z$=Z$+Y$                         :REM*234
6398Ø GET#2,Y$:IFY$=CHR$(34)THEN6398Ø
                                       :REM*145
63981 IFY$<>""THEN63979                :REM*192
63983 PRINTC;:IFC=ØTHENPRINT"{3 CRSR LFs} D
      IR:{CTRL 9}";                    :REM*22Ø
63984 POKE211,7:PRINTZ$:Z$="":IFPEEK(214)>2
      1THENPRINT:GOSUB6399Ø:PRINT"{SHFT CLR
      }";                              :REM*163
63986 GOTO63972                        :REM*7
6399Ø PRINT"{CRSR DN}";:IFQ<>-1THENPRINT"{L
      EFT ARROW} FOR MENU{2 SPACEs}OR ";
                                       :REM*169
63991 PRINT"-PRESS ANY KEY-";:POKE198,Ø:WAI
      T198,1:Y=PEEK(631):K$=CHR$(Y):REM*1Ø4
63992 POKE198,Ø:IFK$="{LEFT ARROW}"ORQ=-1TH
      ENCLOSE2:RUN639ØØ                :REM*193
63993 PRINT:RETURN                     :REM*18
63995 CLOSE2:OPEN2,8,2,F$              :REM*228
63996 INPUT#15,E,E$:IFE<2ØTHENRETURN
                                       :REM*217
63997 PRINT"{CRSR DN}DISK ERROR#"E;E$:PRINT
      #15,"I":Q=-1:GOTO6399Ø           :REM*22
63998 PRINT"{SHFT CLR}{2 CRSR DNs}TYPE PROG
      RAM LINES. TO RESTART QUICK MERGE, TY
      PE 'RUN 639ØØ'"                  :REM*151
63999 PRINT"{SHFT CLR}{CRSR DN}PROGRAM TERM
      INATED":END                      :REM*25Ø
```

Circle 7 on Reader Service card.

TURN YOUR COMPUTER INTO A

ROBOTIC WORKSHOP



The **ROBOTIC WORKSHOPS** plug into your home computer and include everything you'll need to build hundreds of projects. The **WORKSHOPS** contain interface unit, motors, gears, sensors, construction components, software and instructions.

FOR THE BEGINNER:
You'll start by building sample projects that we've designed for you. A knowledge of programming is **not** required to perform these projects. We've included full instructions and operating software.

FOR THE BASIC PROGRAMMER:
When you're ready to design and build your own projects, we show you how. We've added 25 new commands to the "BASIC" programming language.

FOR THE ADVANCED PROGRAMMER AND HOBBIEST:
For the serious user we have included technical specs, schematics, machine language routines and advanced commands and techniques.

PREDESIGNED EXAMPLE PROJECTS INCLUDE:

- **MOTORS,** Gears and Generators
- Velocity and Motion
- Motorized Mechanical **ROBOTICS**
- **INFRARED SENSORS**
- Digital Storage **OSCILLOSCOPE**
- Digital **VOLTMETER**
- **SPEECH** Digitization and Playback
- Electronic Counting and Timing
- Computer Controlled Models
- Cars, Cranes, **ROBOTICS**

	WORKSHOP (50 PROJECTS)	WORKSHOP PLUS (100 PROJECTS)
C-64	$129.95	$199.95
ATARI (8 BIT)	$139.95	$209.95

Coming soon on APPLE, AMIGA, ATARI ST, IBM.

If you cannot find our products at your local dealer, you can order direct on your VISA or MASTERCARD.

Call Us TOLL FREE 1-800-824-2549

Access Software Inc., 2561 S. 1560 W., Woods Cross, UT. 84087
(DESIGNED AND MANUFACTURED by MULTIBOTICS, INC.)

Circle 132 on Reader Service card.



V2.2 ULTRABYTE DISK NIBBLER

NEW UPDATED NIBBLE COPIER FOR COMMODORE 64 and 128 (in 64 mode)

- **Copies 105 recent disks not copied by the original ULTRABYTE DISK NIBBLER**
- **Copies 99 + % of protected software**
- **New fast file copy program and new reliable fast backup for unprotected disks**

NIBBLER V2.2 EVEN COPIES ITSELF

For this reason, no refunds will be given

THREE NIBBLERS ON ONE DISK

- **Single 1541 or 1571, copies in 3 minutes**
- **Two 1541's, copies in 60 seconds**
- **Dual MSD drive, copies in 70 seconds**
- **Both automatic and manual copy parameters for single 1541 or 1571**

$ 39.95 + $ 4.00 shipping & handling

Mastercard, Visa, Check or M.O., Calif. add 6.5% ($ 2.60) sales tax. Foreign orders / COD add $ 2.00. Payment must be in U.S. funds

UPDATES - Previous ULTRABYTE customers may order V2.2 for $ 20.00 plus $ 4.00 shipping. Owners of V2.0 or V2.1 may have their disk updated to V2.2 by returning the original disk with $10.00 plus $ 4.00 shipping. Foreign add $ 2.00. No COD's

To order, write or call 24 hr. order line
For information, write. Phone for orders only

ULTRABYTE (818) 796 - 0576
P.O. Box 789 LaCanada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED

Circle 302 on Reader Service card.

TELEMESSAGE
C-64 BULLETIN BOARD SYSTEM
INTELLIGENT SOFTWARE FOR SERIOUS USERS!
"A package with a lot to offer."
Guy Wright—RUN Magazine—Nov. '85

A FULL-FEATURED SYSTEM:

- Automatic 1200/300 baud
- Software clock & calendar
- Automatic msg. no. cycling
- Private SYSOP msg. file
- Automatic configuration to your modem/RS232 interface
- Solid CRASH PROOF design
- Automatic mail-search
- Fast UPLOAD/DOWNLOAD
- Automatic error recovery
- Fifty Sub-Info areas
- Easily customized
- Fast disconnect
- Operates in standard ASCII
- Automatic call-log record
- On-line membership application
- Automatic msg. "aging" option
- Automatic 5 min. warning msg.
- Public/private msg. option
- On-line CHAT feature
- Detailed 50-pg. operation manual
- Menu driven & user friendly
- Includes 5 support programs
- Leveled access passwords
- Automatic startup/shutdown
- Keyboard password security option

SECURITY:

Includes sophisticated security features that rival the large information services. No need for concern about callers abusing or crashing TELEMESSAGE!

BUSINESS APPLICATIONS:

TELEMESSAGE is perfect for on-line shopping and advertising. You can also use it for interoffice EMAIL for your employees!

HARDWARE REQUIREMENTS:

1—Most all autoanswer modems including Westridge, Hayes, Volksmodem, Tele Learning, Commodore 1650/1670, Mitey Mo (specify on order if Mitey Mo).
2—Works with 2 single, or 1 dual drive. Commodore 1541/1571 and compatibles, including the MSD SD-2 (specify drive model on order).
You get all of these features and many more, in a truly integrated system for only **$79.50**. Please make payment by check or money order. Your C.O.D. phone order (U.S. only) is welcome! (Add $3.00 for C.O.D.)

TAILORED SOLUTIONS
P.O. BOX 183, WASHINGTON, D.C. 20044
PHONE (703) 845-8576 BROCHURE AVAILABLE

Tired of your old BBS? Trade it in for up to **$29.95**! (Call for details)

Circle 197 on Reader Service card.

THE BASEBALL DATABASE



LET YOUR COMPUTER KEEP TRACK OF YOUR TEAM'S BASEBALL STATS FOR YOU!

EASY TO USE

- Clear Screen Directions
- Easy Data Entry and Correction
- Detailed Users Manual
- Fast Statistics Retrieval from Disk

COMPREHENSIVE

- 23 Batting and Fielding Statistics
- 22 Pitching Statistics
- Up to 30 Players
- Unlimited Games
- Hits, Runs, Errors, LOB and ERs for Every Inning
- All Totals, Cumulatives, Averages Etc. Calculated

DETAILED PRINTED REPORTS

- Player Rosters
- Game Summaries
- Pitching Cumulatives
- And a lot more
- Win/Loss Records
- Team Cumulatives
- Player Histories

$49.95 APPLE IIe/IIc **$39.95** COMMODORE 64

- 15 day money back guarantee
- Check or money order please, plus $2.50 shipping and handling
- Program specs and details available upon request.

JACOBSEN SOFTWARE DESIGNS

1590 E. 43rd Avenue
Eugene, Oregon 97405
Phone: (503) 343-8030

The Dynamic Keyboard

By WILLIAM W. BRAUN and JIM BORDEN

Here's your chance to explore the dynamic keyboard and to learn how to save memory by adding and deleting lines while your programs run.

The dynamic keyboard technique adds power and flexibility to your programming projects. With it, you'll learn how to do things that normally are only done, in the Direct mode, from the keyboard. You'll be able to delete and add lines to your programs while the program is running. You'll also learn how to make your program automatically load and run another program.

Before you start, you need to know what is meant by "dynamic keyboard technique." When you press a key, a code for that key is sent to the keyboard buffer. This buffer is a ten-byte area of RAM, located at 631–640 on both the VIC-20 and the C-64. (For the C-128, see the last part of this article.) The computer's operating system is programmed to check for characters in this buffer after the Ready message is displayed on the screen, or at an Input or Get statement.

The operating system knows how many characters are in the buffer by checking the contents of another location in RAM—198. This location holds a number from 0 through 10 that indicates the number of characters in the keyboard buffer.

If there is a 0 in 198, the computer knows it does not have any characters to retrieve from the buffer; if it finds a 5, it understands that it should pull five characters out of the buffer. It works on the FIFO principle—first in, first out—meaning the first character put into the buffer is the first one that will be retrieved from it.

Try this quick experiment. Type:

```
FOR T=0 TO 6000 : NEXT
```

After you press the return key, type in your name. The computer is tied up executing this loop, but your keystrokes are placed in the keyboard buffer, and, after loop execution is completed, your name (up to ten characters) appears on the screen.

Since the keyboard buffer and the pointer at 198 are in RAM, you can Poke numbers into them as you wish. This allows you to put information into the keyboard buffer without using the keyboard.

Suppose you want your program to execute once and then erase itself from memory so it cannot be listed or run again. Using the dynamic keyboard, you can place the needed information into the keyboard buffer just before the program ends. When the program ends, it checks the buffer and acts upon that information.

Below is a short routine that accomplishes this by making the computer execute a New command.

```
900 REM END OF PROGRAM ROUTINE
910 POKE 631,78 : POKE 632,69 : POKE
    633,87 : POKE 634,13 : POKE 198,4 : END
```

The numbers Poked into the buffer are CHR$ codes, as follows:

78	N
69	E
87	W
13	return key

You Poked a 4 into location 198 to let the computer know that there were four characters to retrieve from the keyboard buffer. When the program ends, the computer pulls the New and Return commands from the buffer and executes them just as if you had typed in NEW and pressed the return key yourself.

Note that you had to type out the Basic keyword NEW, but only had to use one CHR$ code for return. This is because code 13 is sent to the keyboard buffer whenever you press the return key. There is no single number CHR$ code for the New command. You can place any of the Basic commands into the keyboard buffer in the same way. Keyword abbreviations can also be used.

RUN It Right

C-64; C-128; VIC-20

To convince yourself that this works, enter line 910 into your computer and run it. Now see if you can list it. Presto! The program's been deleted.

Deleting Lines and Saving Memory

You can expand this routine so that it will not only execute a New command, but will also perform Load and Run commands of another program on tape. This technique is especially useful when you don't have enough memory to run a program on the unexpanded VIC-20. You can break it up into two or more parts and have each part automatically load and run the next part. Just change line 910 of the previous routine:

```
910 POKE631,78:POKE632,69:POKE633,87:
    POKE634,13:POKE635,131:
    POKE198,5:END
```

NEW is not required, since a Direct mode load will do a NEW in any case.

With this line, you added POKE 635,131, which is a code for the Load and Run commands, and you increased the number Poked to 198 to 5. Now, when the program ends, it executes the New command and the screen displays the usual messages for loading a program. If you left the tape player in the play position, it does everything without any further action on your part.

Another way to run very long programs is to delete lines that are needed only once at the beginning of the program, before you define variables or set up arrays. Variables and arrays don't eat up memory until you actually reach the statement in the program that defines them. Often, you can list a program without exceeding your memory, but when it starts to define variables or dimension arrays, you get that dreaded Out of Memory error message. This trick allows you to free some of the memory before you define the variables.

To illustrate how this is done, assume you have written a program in which the instructions are found in lines 40, 50 and 60. You're going to delete those lines and also the deletion routine, as you won't need it again. You can do it this way:

```
100 PRINT "{SHFT CLR}{4 CRSR DNs}
    40"SPC(20)"50"SPC(20)"60"SPC(20)
    "100"SPC(20)"105"SPC(19)"GOTO110":
    PRINT"{HOME}"
105 FOR T=0 TO 5:POKE631+T,13:NEXT:
    POKE198,7 :END
110 .....
```

Note that if you're using the C-64, you must change the SPC commands to compensate for the difference in screen line lengths. (Add 18 for the C-64.)

When the routine is executed, the screen briefly displays all Print messages. On the screen you'll see

```
40
50
60
100
105
GOTO110
```

beginning at the fourth line from the top of the screen. The cursor then returns to the home position, so that when the computer reaches the End statement in line 105, the cursor ends up on the screen line with the 40, after the Ready message is displayed.

At this point, due to the Return commands you placed in the keyboard buffer, the six lines you've printed on the screen are executed in the Direct mode. The last command, GOTO110, restarts the program at line 110, as it had temporarily ended at line 105. (At this point, all variables are cleared.)

This routine is different from those previously discussed, adding a new twist. You only put Return commands in the keyboard buffer. You then put any message on the screen, set up the cursor so that it lands on the first message after READY is displayed and then go to the keyboard buffer to get those returns. As each return is executed, it's just as if you had typed in the number of the line you wanted to delete and had pressed the return key.

The End statement in line 105 is essential. The program has to end for a moment, in order to force it to get those returns from the keyboard buffer. The last return executes the GOTO110 command, which restarts the program at line 110. Any time you use this technique to delete lines or even to add lines (as you'll soon see), you need the End statement after the code that puts the returns into the keyboard buffer. You also need the last command to tell the computer where to restart the program.

Cursor Position

Note that you also need to set things up properly on the screen so that the cursor is on the right screen line when those returns are executed. You enter a SHFT CLR command and then go down four lines to start printing the line numbers and your one message. Then, before you allow the computer to perform the End statement, you place the cursor back in the home position. This ensures that when the computer reaches the End statement, it puts the ready message at the top-left corner of the screen and the cursor on the first screen line with your line numbers.

To make the screen display seem less confusing, put a Print Color command in the routine in line 100, so that the messages printed are in the same color as the screen, thus making them invisible. Then put another Print Color command in line 110 so that when the program starts up again, it will have a normal print color. This eliminates the quick flash of messages on the screen.

Since the keyboard buffer is only ten bytes long, you can only enter ten returns at a time, thus limiting the number of lines you may delete.

Adding Lines

To add lines to a program, you put the line number on the screen, along with all of the code for the new line, and then execute a Return command over it.

In the following example, you want to be able to enter data and then put that data into a new Data statement within the program. The routine for entering the data should precede the routine to put in the new line number. If you are doing a lot of these, use a variable (which must be Poked, not printed) to hold the value of successive line numbers. This routine creates a new line 900 with one piece of data, being the variable X, that is entered before the routine.

```
100 PRINT"{SHFT CLR}{4 CRSR DNs}
105 PRINT"900DATA"X:PRINT
    "GOTO115{HOME}"
110 POKE 631,13:POKE632,13:
    POKE198,2:END
115 .....
```

This routine prints the new line 900 on the screen with the Data statement and the value of the variable X. It then prints the GOTO115 command and returns the cursor to the home position.

Now, just as in the last example, the program executes the End statement, prints the Ready message and performs the two Return commands you put in the keyboard buffer. This causes the new line 900 to be added to the program. You can enter this routine into your computer and run it, after which you will see that the program now has a new line 900 with one piece of data (a zero, since you didn't define X previously).

Now that you understand the basics

of the dynamic keyboard, keep the technique in mind when looking for solutions to your programming problems. You'll soon find uses for it that will contribute greatly to extending the power and flexibility of your computer.

The C-128's Dynamic Keyboard

The C-128 has a dynamic keyboard just like all Commodore computers, but it differs from that of the C-64 in several ways. First, the locations have been changed: the buffer to 842–851 ($034A–$0353) and the keystroke counter to 208 ($D0). As an added twist, the C-128 uses a different pair of locations to handle function keys. More on these locations later.

Except for the function keys, the C-128 dynamic keyboard works just like the C-64 or VIC. You can enter your name during a delay loop, just as described above. You can also Poke characters into the buffer and the number of those characters into the keystroke counter. Here is a program to print C-128 on the screen:

```
100 A$="C-128"+CHR$(141):
    IFLEN(A$)<11THENFORX=
    1TOLEN(A$):POKE841+X,ASC(MID$
    (A$,X,1)):NEXT:POKE208,LEN(A$)
```

The last character (141) is a shifted return—a normal return would cause a syntax error. The only difference from the C-64 is the location. Now let's look at the way the function keys are handled on the C-128.

The 128 actually has 10 programmable function keys. In addition to the 8 regular "f#" keys, you can also program the help and run/stop keys (but not from Basic). When you want a delay loop on the C-128, simply type SLEEP #, where # is the number of seconds you want the C-128 to wait. Try SLEEP 3 now, and while the computer is "sleeping," press the help key. After the delay, the screen displays READY, and then HELP. Now type:

```
SLEEP3:POKE209,0<return>
```

and again press the help key. Nothing but the regular READY prompt. So, what happened to HELP?

Location 209 ($D1) holds the number of characters in the function-key string. By Poking a zero into location 209, you actually clear the function-key indicator. This means that to ensure that *no* key is waiting in the C-128's dynamic keyboard, you have to use two Pokes. The first (POKE 208,0) clears all but the function keys, while the second (POKE 209,0) clears any function keys that may be waiting.

To put a function key into the buffer, you have one more location to Poke. This is location 210, which is an index as to where the function-key string starts. You can see all the function-key data (including the string lengths and their definitions) by using the ML monitor. First press the f8 key or type MONITOR <return>. Then type the following:

```
M 1000,105F <return>
```

To return to Basic, type:

```
X <return>
```

The first 10 bytes ($1000 to $1009, or 4096 to 4105 in decimal) are the lengths (in hexadecimal) of the function-key strings. Assuming you have not changed the function keys, they should now all be displayed on the screen. (You can read their definitions on the right side.)

We'll only work with the f1 key here. As you can see on the screen, the length of f1 is 7 (at $1000) and the text is GRAPHIC (starting at $100A). The index for the f1 key is always 0. Keep in mind, however, that if you change the lengths of any key strings, the index for subsequent keys will change.

You can redefine any of the regular (f1-f8) function keys from Basic using:

```
KEY #,"TEXT" <return>
```

where # is the number of the key you want to define and TEXT is the string you want to assign to it. Try this (having been sure to type X to exit the ML monitor):

```
KEY 1,"THE C-128 IS GREAT"+CHR$(141)
<return>
```

If you'd like, enter the monitor again to verify that f1 was actually changed. Now, from Immediate mode, type in:

```
POKE 208,0:POKE209,19:POKE210,0
<return>
```

You should see THE C-128 IS GREAT printed a few lines down.

You can see all the function keys in Basic by typing KEY (without a number) and hitting the return key. If you want to print a different string on the screen, just redefine Key 1 and use the Pokes to 208, 209 and 210. Be sure to POKE 209 with the length and 210 with the starting index. Keeping Key 1 as it is now defined (THE C-128 IS GREAT), you could redefine Key 2 to hold the string "HI, THERE". To print this string, you would enter POKE 208,0 : POKE 209,9 : POKE 210,19.

To take this one step further, you can control cursor activity on the screen. By defining Key 1 to 15 returns, you can print 15 or fewer of them by changing the number you Poke into 209. Poke it with 5, and you'll get 5 returns. You'll need a "HOME" as the first character, so type this:

```
A$=CHR$(19):FORX=1TO15:A$=A$+
CHR$(13):NEXT: KEY1,A$ <return>
```

Then type the following line:

```
PRINT"{SHFT CLR}";:FORX=1TO5:PRINT
X"REM":NEXT:POKE209,6:POKE210,0
<return>
```

and type LIST after the cursor appears. You should have a five-line program, with REM on each line. Notice that 6 was used as the length for HOME + 5 returns.

This should open up all sorts of possibilities for printing commands on the screen and using the correct number of returns to execute them. You can define one function-key string up to a maximum of about 240 characters. If you exceed the total length for all keys, an Out of Memory error will result.

There are two more twists regarding the function keys and the dynamic keyboard. Only *one* function key—the *last* one pressed—will be accepted. Type SLEEP 5 and hit the return key. Press several function keys, but be sure you press the help key last. You should see HELP printed on the screen. So the last function key pressed is the only one that counts! Moreover, even if you press a function key *within* a group of other keys, that function key will always be printed first! Try typing SLEEP 5 again, but then type 123<HELP>456 during the pause. The following should be printed:

```
HELP
123456
```

That covers the basics of the C-128 dynamic keyboard. One other interesting point is that entering or editing a line on the C-128 does *not* clear variables. This makes it quite simple to add data statements to the end of a program. You must use a GOTO to get back into the program, however, since RUN (or NEW or CLR) *will* clear all variables. R

Address C-64 questions to William W. Braun, 3164 Wellington Way, Arnold, MO 63010; address C-128 questions to Jim Borden, Borden Software, 641 Adams Road, Carlisle, PA 17013.

Circle 75 on Reader Service card.

COMPUTER REPAIR

800-221-7770

Commodore Disk Drive 1541 1571	$60.00	Commodore Monitor 1701 1702	$60.00
Commodore SX-64 Portable Computer	$85.00	64	$45.00
Commodore Printer MPS 801 MPS 803	$50.00	Commodore Printer 1526 MPS 802	$60.00
MSD Commodore Compatible Dual Disk Drive C128 CBM	$85.00	Commodore Computer 8032 8050	$65.00

AUTHORIZED commodore SERVICE CENTER

We Buy Computer Equipment

ALIVE

64	75.00
1541	85.00
8050	150.00

DEAD

64	50.00
1541	60.00
8050	100.00

PARTS FOR SALE

Commodore Parts For Sale

82S100	21.95
6502	5.95
6504	5.95
6520	5.95
6522	5.95
6526	15.95
6567	28.95
6581	19.95
6510	14.95

CALL FOR OTHERS

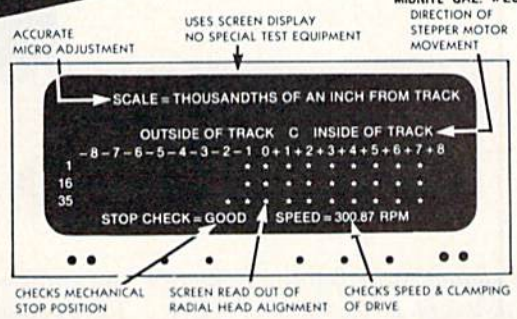
T.C ELECTRONICS
HWY 36 PO 1129
HARTSELLE, AL. 35640
800-221-7770

Circle 192 on Reader Service card.

1541 PHYSICAL EXAM

NEW 1571 PHYSICAL EXAM
4040 PHYSICAL EXAM
8050 PHYSICAL EXAM
8250 PHYSICAL EXAM

SEE REVIEWS IN:
RUN. 6/85 P. 14
AHOY. 4/85 P. 32
MIDNITE GAZ. #23 P. 78



PACKAGE INCLUDES: True digital alignment disk with offset tracks • Quiet drive stop for alps style drive to reduce the need for continued realignment. • Stop not required for neutronics drive..

800-762-5645

PHYSICAL EXAM $39.95 EA.
EXTRA STOPS $4.95 EA. + SHIP.
PLEASE SPECIFY WHICH DRIVE!!

IN CANADA: (416) 448-0848
APPIN MICRO 1283 PHARMACY AVE.
SCARBOROUGH, ONTARIO CANADA W1R 2J1

Cardinal Software
14840 Build America Drive
Woodbridge, VA 22191
Info: (703) 491-6494

Circle 350 on Reader Service card.

FLOPPY HOUSE

16 S. Chestnut Street, Box 308, Palmyra, PA 17078

Adventure Const. Set	$29.95
AMIGA Software now arriving	CALL
Beachhead II	$24.95
Bat. Incl. Home Org. Pgms. ea.	$13.95
Doodle	$26.95
Elite	$21.95
Fight Night	$21.95
Flight Simulator II	$32.95
Gary Kitchen's Game Maker	$27.95
Hardball	$21.95
ISEPIC	$52.95
M.P.P. 1064 Modem	*$59.95*
MicroLeague Baseball	$27.95
1984, 1985, Wrld. Ser. or All Star	$13.95
Mirage Data Base or Word Proc.	$38.95
Newsroom	$34.95
Newsroom Clip Art Collection	$21.95
Night Mission Pinball	$21.95
Paperback Writer 128	$39.95
Screen Dumper64	$17.95
Skyfox	$24.95
Star Rank Boxing	$21.95
Superbowl Sunday	$20.95
Ultima IV	$42.95
V.I.P. Terminal	$29.95
Voice Messinger	$43.95
Xetec Sup. Grap. Int.	$62.95

***** FREE! *****

(With any software order) — an excellent Public Domain version of an arcade hit game on its own disk.

TOLL FREE 1-800 633-8699 In Pa. Call A.C. 717 838-8632

LEROY'S CHEAT SHEETS
All titles $2.95
(Add $1.00 for mailing)

ORDERING & TERMS

— M.C. and VISA accepted with no charge in the continental U.S.A.

— $2.50 shipping charge on orders under $100.00

— PA residents. Please add 6% sales tax

— Prices subject to change without notice

Circle 74 on Reader Service card.

PROFESSIONAL HANDICAPPING SYSTEMS

• PRESENTED BY PROFESSOR JONES •

GLD. Thoroughbred "Gold" Edition™
A "Full" featured thoroughbred analysis designed for the professional and the serious novice.
$159.95 complete

EGLD. Enhanced "Gold" Edition™
"Gold" Edition with complete Master Bettor™ system integrated onto the same disk. This powerful program will transfer all horses and scores to the bet analysis with a "single keystroke."
(Master Bettor™ included) $199.95 complete

GLTD. Limited "Gold"™
Enables **Professional Handicappers** to assign specific values to the racing variables *they* feel are important. Create program weight based on a particular track and fine tune it for **maximum** win percentage. This program is designed for "ease of use". The user needs **no programming experience.**
(contains Integrated Bettor™) $299.95 complete

GD. Gold Dog Analysis™ $149.95
The *ONLY* professional greyhound analysis available that evaluates *ALL* variables. w/Integrated Bettor $199.95 Limited Version $299.95

MHH. Master Harness Handicapper™
Professional software designed to provide a thorough analysis of all trotter and pacer races in the United States and Canada.
complete $159.95 w/Integrated Bettor $199.95 Limited $299.95

Professor Pix Football™
Complete STATISTICAL ANALYSIS on Data Base allowing "Designated" previous games to be evaluated.
Statistical Series $99.95 w/Win-Loss Power Ratings $149.95

NBA. Basketball™ NBA $99.95 w/college $129.95 w/power ratings $149.95

LOT. Lottery Analysis™
Statistical comparison program designed to detect subtle patterns in winning numbers and digits.
Lottery (3-4 digit) $79.95 w/Lotto (Max. 99 Digit) $99.95

PC-3 Portable Computer (4k) w/choice of Thoroughbred, Greyhound or Trotter™ $249.95 (Includes portable computer & program.)

M-100 Portable (32k) w/choice of Thoroughbred, Greyhound, or Trotter and Master Bettor. $649.95
(Includes portable computer and program.)

FREE CATALOG!

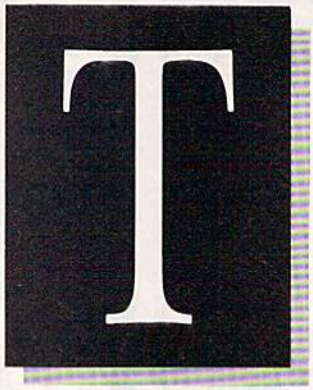
★★★★★
"Your BEST BET in handicapping software..."
Reviewed by: Whole Earth Software Guide Corona Data Systems

Prof. Jones
1940 W. State
Boise, ID 83702
VISA MasterCard
AMEX

48 HR. FREE SHIPPING

CALL
(208) 342-6939

TERMS: **Free shipping all software.** Add $6.00 hardware/$6.00 C.O.D. / UPS Blue $6.00/Out of Country $9.00/ID Residents 4%/3 weeks personal checks/Cash price only, add 2% Visa, MC, AMEX. Prices subject to change.



By ROBERT SIMS

Telecomputing Workshop is a monthly column dedicated to the needs of RUN *readers who are using, or intend to use, a Commodore computer for telecommunications. We invite you to submit your questions to:*

Robert Sims
Telecomputing Workshop
c/o RUN *magazine*
80 Pine St.
Peterborough, NH 03458

Questions will be selected for publication on the basis of their probable interest to the majority of readers and will be answered only through this column.

Would you please tell me what telephone number to call to connect to the big services (CompuServe, The Source, etc.) and how much the telephone aspect of telecomputing will cost. Do they have "800" numbers? Are there local numbers one can call? Can you access them through AT&T, or do you need MCI or something else? I fear being zonked with a huge phone bill. Finally, do you need Touch Tone dialing, or will good old rotary dialing work?

Matthew Dyer
Augusta, ME

If you live in an urban area, connecting to one of these national services is just like calling your Aunt Hattie down the street. All of the national database services are connected to telephone networks that allow customers in urban areas to connect through a local number. AT&T, MCI and the other long-distance phone companies are not directly involved in the process. Since it's a local call, the question of whether you use Touch Tone or rotary dialing depends on which method your local phone system uses.

When you subscribe to a service, you'll be given a local phone number, called a node, which ties you into the national phone network. The cost of using this network is covered in the basic hourly rate charged by the service, so you shouldn't be billed separately for using it. (The charge for using the network is much less than regular long-distance rates.)

However, if you don't live in a major urban area, there may not be a local number, and you'll be given a number in the nearest city. If that city is long distance, you'll be paying long-distance charges to your local phone company in addition to the service's charges. You could end up paying up to $15 an hour to connect to the database service.

So, before subscribing to a national database service, call the service's 800 number to find out if it's a long-distance call from your home.

I received my first modem as a gift several years ago, and I've never been able to send or receive clearly. When I access databases and bulletin boards, I receive garbled and unreadable messages.

Using different terminal programs, I have tried the modem with my VIC, C-64 and, now, the C-128, with the same results.

I'm wondering if my problem may be due to my phone line. I frequently hear static and, sometimes, other conversations.

I would like to buy a new modem, but hesitate to spend any more money unless there is a cure for my problem. Any suggestions?

Leonora Crain
Wayne, NJ

Static or other voices on a phone line are bad for telecomputing and often cause modem signals to become garbled. But getting garbage all the time, as you describe, points to the modem rather than the phone line.

I suggest that you borrow a modem—one that you know is working—from a friend, and try it on your phone line. If it works reasonably well, then your modem is defective.

You can also turn the test around—have a friend use your modem on his system. If his transmissions turn to garbage, then, again, your modem is faulty.

Would you please provide information about transferring data via modem between a Commodore and a) another Commodore, b) an IBM PC and c) a Radio Shack Model 100. I want people who are away from the office to be able to use Model 100s to enter daily activity into a Commodore at the office.

Scott Rorex
Imboden, AR

First, you should know that, in an upcoming issue, *RUN* will be publishing a program that allows data transfer between your Commodore and the Model 100.

For the other aspects of your situation, as long as two computers are running terminal programs that communicate in standard ASCII, you can

transfer text between them, regardless of make. Any terminal program worth having will tell you very clearly in the documentation whether it can communicate in standard ASCII.

However, to connect the remote computers with the Commodore in your office, you must do one of two things. Either somebody in the office must take the call and manually connect the office computer to the phone line, or your office computer must be equipped with an auto-answer modem and have software that's capable of automatically answering the phone.

I have the call-waiting feature on my phone; when I'm talking, a beep sounds to let me know someone else is calling. Will this signal interfere with my modem's functioning when I'm receiving data?

Edward Basner
Wynnewood, PA

The call-waiting feature is convenient for those who receive many phone calls, but it's a major headache for modem users. If you're lucky, the beep will only cause a few garbled characters; but in many cases, the beep interrupts the carrier signal that computers use to maintain their connection. It happens all too often that the software in one of the computers will treat the beep as a lost connection and will hang up. You have two choices: Have the phone company remove the call-waiting feature or install a second phone line for modem use.

Commodore's latest modem, a 1200-bps unit, comes with software to make my C-64 perform as a remote terminal. Is this terminal-emulator package what I need for off-campus connection to the computer at my university? Terminal time is at a premium, what with business concerns time-sharing on the school's computer.

John Johnson
Detroit, MI

It's good that you're a student, because you have some research to do. Connecting a home computer to a mainframe is not a simple task.

First, find out if the school's computer transmits data at the same speed as your modem. If the modems work at different speeds, you're in trouble.

Next, find out from the school's data-processing department whether your modem's terminal program will work with their system. If you're lucky, you'll only need some documentation on how to log onto the school's computer and how to send and receive data. If the school computer only communicates with special software, then your modem's terminal program won't work.

While you're at it, make sure that using a remote terminal will cost less than using one of the school's terminals. Since there's considerable expense involved in setting up and maintaining a telecommunications link to a computer, you may pay more to call the school computer from home than you would to use a terminal on campus.

I used Perfect Typist to enter your ML Perfect Typist because I want to type in your terminal program, Runterm Plus. However, for some reason, I could not run ML Perfect Typist properly. When I run it, a line of dots appears. If I stop the program by pressing the run/stop key, the screen displays, "Break At Line 10." I checked the program and didn't detect any errors. Is there any bug in the program?

Manh Huu Vu
Hamilton, Ontario
Canada

There is no bug. The dots fill the screen to let you know that the program is running, while the Basic portion of ML Perfect Typist transfers the machine language portion of the program from the Data statements to their proper place in memory. If you press the run/stop key while the machine code is being loaded, you will receive a Break in Line 10 error message because line 10 of the Basic portion contains the Read loop, which moves the machine code.

Once the program configures itself, you should get the opening screen as described in the ML Perfect Typist article. If you don't see this screen, then you should check your version of the program against the magazine listing.

I have a problem with ML Perfect Typist, which I typed in from *RUN*'s December 1985 issue. When I run the program, I get an Out of Data error in line 10. What's wrong?

Donald Smith
Aurora, IL

The computer displays this error during a Read loop when there aren't enough elements in the program's Data statements. Be sure to include all the lines containing Data statements; it's easy to leave one out. Also, be sure that every number (except the last) in each statement is followed by a comma.

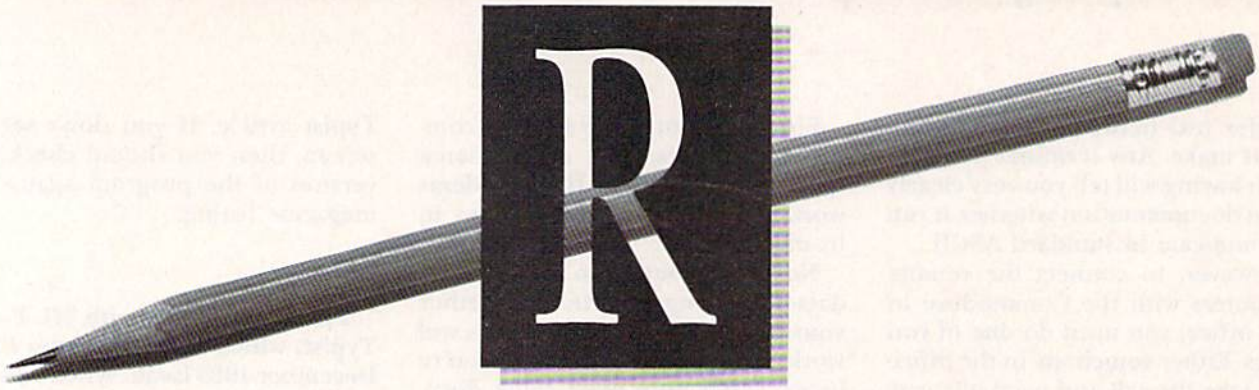
Can you tell me the names of some inexpensive BBS programs? My club wants to start up its own bulletin board.

M. Gorts
Maynard, MA

There are many good-quality bulletin board programs that you can get without spending a lot of money. HAL and Kermit are two such BBSs, and you can download these from most of the major information networks, like CompuServe, Quantum-Link or Delphi.

To locate public domain (free) BBS programs on these networks, just go into the telecommunications or BBS database of the Commodore SIG, and you'll see a list of the BBSs available. Simply download whichever one you want.

There's a lot of low-cost BBS software (less than $75) available, but it doesn't often get advertised, because the programmers aren't associated with the larger software firms that can afford national advertising. However, you can find out about many of these low-cost programs by, again, going on-line. You should check out the vendor/shopping sections of the Commodore SIGs for descriptions, prices and ordering information. R



By MARGARET MORABITO

This month—two Commodore support services; Commodore's third-party developers; the Young Astronaut Program; new online education SIG.

I often get questions from people wanting to know what Commodore actually does to support education. Recently, I spoke with Commodore's key educational people to find out what the company is doing in this area.

Many educators have asked whether or not there are support services for teachers using Commodore computers. Pat Walkington, Manager of Educational Marketing at Commodore headquarters in West Chester, Pennsylvania, told me that Commodore does indeed provide a good deal of teacher and system support. They have two primary service support programs to help schools set up their own computer classes and maintain their equipment.

Commodore-Authorized Education Dealers

Commodore has over 100 authorized education dealers across the nation. (A list of them is included at the end of this column.) These dealers have personnel trained to handle school needs. They can advise schools as to what Commodore hardware they need to buy and recommend the software appropriate for particular courses.

In addition, these dealers are all required to have a Commodore service department, so a school that purchases equipment from one of them can rely on that dealer for service and maintenance.

Commodore gives these dealers special hardware discounts, which are then passed on to school customers. Educators are thus better off buying from these dealers than from mass merchandisers, because of both the low prices and the support services they so badly need.

School Service Program

What about those schools in remote areas that don't have a local authorized education dealer? What do they do? To address this problem, Commodore implemented their School Service Program last year.

This program is run from Commodore's West Chester headquarters. Any school district or regional service agency (such as BOCES in New York) is eligible for training in the maintenance of its Commodore equipment. The training is free, but the school district or agency must pay for travel costs and the training materials used.

After the service training, your staff member can order parts for the school's equipment directly from Commodore or from any authorized education dealer.

To qualify for this training, your school district or regional service agency must own at least 100 Commodore products. This may include computers, disk drives, monitors and other peripherals.

Pat Walkington told me that there had been tremendous response to the School Service Program from school districts across the country. The classes are always filled. Each training session, by the way, lasts for a day and a half, and new sessions are held monthly.

For more information on the School Service Program, contact the Education Department, Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380, or call 215-431-9100.

Support for Third-Party Software Developers

In addition to these two service programs for schools, Commodore also encourages continued production of quality C-64 and C-128 educational software through its support of third-party software developers. Much of this support comes in the form of promotional efforts. At education conferences, Commodore invites software producers to exhibit their products in its booths and provides computers so they can demonstrate their software at their own booths.

Commodore also advertises third-party software, and is currently distributing a new list thereof at educational trade shows. This list comes directly from EPIE (Educational Products Information Exchange) and includes a description of each program, along with its title, subject matter and appropriate grade level. The computers covered are the C-64, the C-128 and the new PC-10, which is IBM-compatible.

Another new project involves the

DIGITAL VISION

COMPUTEREYES™

VIDEO IMAGES ON YOUR COMPUTER!

Finally—an inexpensive way to capture real-world images on your computer's graphics display! COMPUTEREYES™ is an innovative slow-scan device that connects between any standard video source (video tape recorder, video camera, videodisk, etc.) and your computer. Under simple software control, a b/w image is acquired in less than six seconds. Unique multi-scan modes also provide realistic grey-scale images. Hundreds of applications!

Package includes interface module, complete easy-to-use software support on disk, owner's manual, and one year warranty all for $129.95 plus $4.00 S&H (USA).



Also available as a complete package including:
- COMPUTEREYES™
- Quality b/w video camera
- Connecting cable

for only $399.95 plus $9.00 S&H.

Demo disk available for $10.00 postpaid (refundable).

ONLY $129.95

See your dealer or order direct. Mass. residents add 5% sales tax. Mastercard, Visa accepted. To order, or for more information, write or call:

Available for:
- Apple II series
- Commodore 64/128
- Atari 800/800XL/65XE/130XE

DIGITAL VISION, INC.
14 Oak Street — Suite 2
Needham, MA 02192
(617) 444-9040, 449-7160

C-64™ • VIC™ • SX-64™ • C-128™ • Plus 4™ • C-16™ • B-128™ • PET™ • CBM™ • LCD™

One disk. 25 business programs, $19.95

The Intelligent Software Package is the one product for your Commodore that can take care of all your data processing needs.

Customers write: *". . . accolades for the authors. This is as slick a deal as I have seen and more than adequate for all except fancy presentations. The best thing is the ease of use . . "*

"I have come to consider these programs among the most valuable pieces of software I own."

There are no hidden fees for shipping or documentation, and no clubs to join. The package is not public domain software, and is sold only direct to customers by mail: it supports all available printers, and will run on any Commodore computer (except Amiga) with a minimum of 10k RAM, including the C-128 in C-128 mode.

What you get when you order the Package:

Database—A complete database manager. All fields completely user-definable. Can be used for any number of tasks, including accounting, checkbook and tax records, mailing lists, inventory control, catalog maintenance, or as an electronic rolodex. A customer writes: *"I am especially impressed with Database, and have used it to replace a half-dozen other 'database'-type programs I had been using."*

Word Processor—A full-featured menu-driven word processor. Allows full control over margins, spacing, paging, indentation, and justification. *"Highly recommended."*—Midnite Software Gazette. *"Provides good basic features."*—Compute's Gazette.

Copycalc—An electronic spreadsheet. *"Excellent program for budgeting, estimating, or any math-oriented use . . . well worth the money. Highly recommended."*—Midnite Software Gazette.

ReportGen—creates form letters, mailing lables, etc.

ReportMerge—creates statements invoices.

Baseball Stats—compiles team batting statistics.

Index—indexes W/P's text files.

Wordcount—counts words in a text file.

WPConvert—converts files to other WP formats.

DBMerge—facilitates relational D/B applications.

DBStat, DBStat2—analyze D/B files.

ASCII—converts text files into program files.

Checkbook—reconciles checkbook.

Inventory—Maintains inventory records.

Paper Route—A/R for paper route.

Loan Analysis—computes finance terms, prints schedules.

Breakeven—computes breakeven analysis.

Depreciation—creates depreciation schedules.

Labeler—creates labels.

File Copier—copies sequential, program files.

Correlation—calculates statistical correlation.

Also other Database and Word Processor utilities.

To order, send name, address, and $19.95 to address below. Please specify regular (1541/1571/2040/4040/2031) disk, 8050 disk, or cassette (cassette not available for Plus 4 or C-16). Add $3 for credit card or COD orders; Calif. residents add 6%. No personal checks from outside USA. A sampling of program output is available for $1. **Tear this ad out and keep it handy!**

Intelligent Software
Quality Software since 1982

Box A Dept. R-8
San Anselmo, CA 94960
(415) 457-6153

Software Discounters of America

S.D. of A

Orders Outside PA—1-800-225-7638
PA Orders — 1-800-223-7784
Customer Service 412-361-5291
Open Saturday

- Free Shipping on orders over $100 in continental USA
- No surcharge for VISA/Mastercard
- Your card is not charged until we ship

ABACUS		Super Boulder Dash (D)		Alphabet Zoo (R)	$9
Basic 128	Call	*Prices too low to advertise!!*	Call	Cosmic Combat (R)	$9
Super C 128	Call	**EPYX**		Homework Helper	Call
Super Pascal 128	Call	Fast Load (R)	$23	Monster Voyage (R)	$9
ACCESS		Fast Load Partner (D)	$23	Story Machine (R)	$9
Beach Head 2 (D)	$24	Koronis Rift (D)	$23	**SPRINGBOARD**	
L.B. Tournament Disk	$14	Multiplan 64 or 128	$39	Graphics Expander for Print Shop (D)	$25
Leader Board Golf (D)	$25	Summer Games II (D)	$23	Newsroom (D)	$33
Mach 5 (R)	$23	The Eidolon (D)	$23	N.R. Clip Art #1 (D)	$19
Mach 128 (R)	$33	Winter Games (D)	$23	N.R. Clip Art #2 (D)	$25
ACCOLADE		**GAMESTAR**		Stickers (D)	$23
Aces of Aces (D)	$19	On-Field Football (D)	$19	**SSI**	
Fight Night (D)	$19	Star-Rank Boxing (D)	$19	Battalion Commander (D)	$25
Hardball (D)	$19	**HAYDEN**		Battlegroup (D)	$37
PSI-5 Trading Co. (D)	$19	Sargon 3 (D)	$33	Colonial Conquest (D)	$25
ACTIVISION		**INFOCOM**		Computer Ambush(D)	$37
Alter Ego-Male (D)	$33	Ballyhoo (D)	$25	Computer QB (D)	$25
Gary Kitchen's Gamemaker (D)	$25	Cut Throats (D)	$23	Field of Fire (D)	$25
Hacker (D)	$19	Enchanter (D)	$23	Gemstone Warrior (D)	$23
Road Race (D)	$19	Hitchhiker's Guide to the Galaxy (D)	$23	Kampfgruppe (D)	$37
ARTWORX		Invisiclues	Call	NAM (D)	$25
Bridge 4.0 (D)	$16	Planetfall (D)	$23	Phantasie (D)	$25
International Hockey (D)	$19	Spellbreaker (D)	$29	Phantasie 2 (D)	$25
Strip Poker (D)	$21	Wishbringer (D)	$23	Questron (D)	$25
Data Disk #1 female	$16	Zork 1 (D)	$23	Rings of Zilfin (D)	$25
Data Disk #2 male	$16	Zork 2 or 3 (D)	$25	Wizards Crown (D)	$25
Data Disk #3 female	$16	**MASTERTRONIC**		**SUBLOGIC**	
AVALON HILL		5-A-Side Soccer (D)	$9	Flight Simulator 2 (D)	$32
Spitfire '40 (D)	$23	The Slugger (D)	$9	Jet (D)	$29
Super Bowl Sunday (D)	$21	**MICROLEAGUE**		Scenery Disks	Call
Tournament Golf (D)	$19	Baseball (D)	$25	**TIMEWORKS**	
BATTERIES INCLUDED		General Manager (D)	$25	Data Manager 2 (D)	$33
Consultant 64 or 128	$39	1985 Team Disk	$16	Data Manager (128)	$43
Paperclip w/Spell 64 or 128	$49	**MICROPROSE**		Evelyn Wood Dynamic Reader (D)	$33
BERKELEY SOFTWORKS		F15 Strike Eagle (D)	$23	Partner 128	$39
Geos (D)	$39	Gunship (D)	$23	Sideways 64 or 128	$19
BRODERBUND		Silent Service (D)	$23	Swiftcalc/ Sideways (128)	$43
Karateka (D)	$19	**MINDSCAPE**		Sylvia Porter's Personal Financial Planner(D)	$39
Print Shop (D)	$26	Color Me: The Computer Coloring Kit (D)	$19	Sylvia Porter's Personal Fin. Planner 128	$43
P.S. Companion (D)	$25	Halley Project (D)	$19	Wordwriter w/ 85,000 Speller (D)	$33
P.S. Graphics Library #1 #2 or #3(D)	$16 Ea.	Infiltrator (D)	$19	Wordwriter w/85,000 Speller (128)	$43
CARDCO		Spell of Destruction (D)	$19	**TRONIX**	
Freeze Frame (R)	$33	Lords of Midnight (D)	$16	S.A.M. (D)	$39
G-Wiz Pr. Interface	$47	Perfect Score SAT (D)	$44	**UNISON WORLD**	
S'More (R)	$47	Quake Minus One (D)	$16	Art Gallery 1 (D)	$16
CBS		Shadowfire (D)	$16	Print Master (D)	$23
Argos Expedition (D)	$9	**MISC.**		**ACCESSORIES**	
Astro Grover (D)	$9	CSM 1541 Align Kit (D)	$29	Bonus SS, DD	$6.99 Bx
Big Bird's Funhouse(R)	$9	Copy 2 (D)	$23	Bonus DS, DD	$7.99 Bx
Dr. Seuss (D)	$9	Firebird Elite (D)	$19	Compuserve Starter Kit	$19
Ernie's Big Splash (D)	$9	Gato(D)	$19	Datashare Printer Int. w/Graphics	$33
Grover's Animal Adv. (D)	$9	Snapshot 64 (R)	Call	Disk Case (Holds 50)	$9
Math Mileage (D)	$9	Spy vs. Spy 2 (D)	$19	Disk Drive Cleaner	$9
Railroad Works (D)	$9	Superbase 64 (D)	$47	Dow Jones News Retrieval Kit(5 hrs.)	$14
Weather Tamers (D)	$9	Superbase 128	$59	Total Auto Answer/ Auto Dial Modem w/Software	$24.88
DATA EAST		Superscript 128	$47	Sakata 13" Color Composite Monitor for C64	$139
Karate Champ (D)	$23	Vizastar 128	Call	Teknika MJ 22 RGB/Comp monitor for C128	Call
Kung Fu Master (D)	$23	Vizawrite 128	Call	Universal Printer Stand	$16
DATASOFT		**ORIGIN**		Wico Bat Handle	$17
Alternate Reality (D)	$25	Ultima 3 (D)	$34	Wico Boss	$12
Never Ending Story(D)	$19	Ultima 4 (D)	$39		
The Goonies (D)	$19	**PROFESSIONAL**			
DAVIDSON		Fleet System 2 64 or 128	$39		
Math Blaster (D)	$33	Fleet System 3 (128)	$49		
Word Attack (D)	$33	**SCARBOROUGH**			
ELECTRONIC ARTS		Build A Book (D)	$17		
Adv. Const. Set(D)		Mastertype (D)	$23		
Archon II: Adept (D)		Net Worth (D)	$44		
Chessmaster 2000 (D)		**SIMON & SCHUSTER**			
Heart of Africa (D)		Great Int'l Airplane Construction Kit (D)	$19		
Movie Maker (D)		Star Trek-The Kobayashi Alternative (D)	$25		
Music Const. Set (D)		Typing Tutor 3 (D)	$25		
One-on-One (D)		**SPINNAKER**			
Pinball Const. Set (D)		Adventure Creator (R)	$9		
Seven Cities Gold (D)					
Skyfox (D)					

SUMMER HOURS:
M-F 9 A.M.-5:30 P.M. EDT
Sat. 10 A.M.-5 P.M. EDT

P.O. BOX 111327—DEPT. RN—BLAWNOX, PA 15238

Ordering and Terms: Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. **Shipping: Continental U.S.A.**—Orders under $100 add $3; **free shipping on orders over $100.** PA residents add 6% sales tax. **AK, HI, FPO, APO, PR**—add $5 on all orders. Sorry—no International orders. Defective merchandise will be replaced with same merchandise. Other returns subject to a 15% restocking charge—NO CREDITS! Return must have authorization number (412) 361-5291. Prices subject to change without notice.



Photo 1. Students at the Winchester elementary school (see Feb. 1986 issue).

bundling of educational sampler disks with its C-64s and 128s. This directly benefits every new user. Commodore is putting some of the best software from the educational market on these disks, so you can see what a commercial educational program does before you buy it.

They are beginning this new project with samples from MECC (Minnesota Educational Computer Consortium), which makes approximately 22% of all educational software now in the schools.

Young Astronaut Program

Commodore also contributes to education by sponsoring national education projects. A major example of this is Commodore's backing of the Young Astronaut Program. I spoke with Dr. Daniel Kuntz, former director of Commodore's Education Division and now on loan from Commodore to act as the national launch director of this program.

According to Dr. Kuntz, there are over 5000 chapters of Young Astronauts throughout the U.S., representing about 20% of all of the nation's school districts. There are also 34 chapters in foreign countries. Commodore's sponsorship of this program includes promotional efforts, donations of equipment and software and developmental costs for software products and curriculum materials.

What is The Young Astronaut Program? It was developed to encourage the study of mathematics, science and technology in elementary and junior high schools. The program supplies curriculum materials and project ideas to help teachers integrate the study of math and science into non-technical subjects such as language arts, history, social studies and art. The materials also enhance existing math and science courses. The theme behind many of these curricular materials is our exploration of space.

Teachers will be interested in the fact that membership in the Young Astronaut Program costs only $20 per year per chapter (with up to 30 members each), and for this fee they receive lesson plans, wall charts and other helpful teaching aids. Members get a monthly newsletter concerning our space program, activities of other chapters, contest information and sponsored field trips to launches and summer camps.

There is also an on-line information network, AstroNet, which members can log onto without charge. AstroNet is accessible through Tymnet and includes features such as monthly space updates from the National Space Institute, a serialized space story called "Space Camp Alpha" and chapter news.

Commodore has also developed software for the Young Astronaut Program. Dr. Kuntz mentioned a new program, Word Shuttle, which is an icon-based word processor for elementary school students.

If you're interested in more information on the Young Astronaut Program, you should contact the Young Astronaut Council, PO Box 65432, Washington, DC 20036.

The Resource Center On-line

I receive letters from teachers, parents and community groups all across the U.S. and Canada who are using Commodore computers for educational purposes. You all have interesting and important contributions to make, and I would like to share

Circle 125 on Reader Service card.

MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI!

FUTURE MUSIC

MIDI HARDWARE SOFTWARE

- COMPUTER MUSIC SPECIALISTS
- ALL MAJOR BRANDS
- THE BEST PRICES
- TECHNICAL SUPPORT

Introductory SALE!

START MAKING REAL MUSIC AT HOME NOW!

• $299 CASIO CZ101 SAVE $200

PROFESSIONAL SYNTHESIZER SOUND, UP TO 4 UNIQUE SOUNDS AT ONCE, MIDI, PROGRAMABLE, PORTABLE, EASY TO USE — THE STANDARD —

• $109 MUSIC SHOP SAVE $40

MIDI VERSION, COMPOSE ON YOUR COMPUTER OR FROM A MIDI KEYBOARD — PLAYS BACK 4 SYNTHS AT ONCE — UP TO 8 VOICES! THE BEST PROGRAM FOR COMPOSING ON THE C64!
• NON MIDI VERSION ONLY $34.95!

• $99 MIDI INTERFACE SAVE $30

- MORE PRODUCTS FOR ALL COMPUTERS!
- CONSUMER GUIDE TO MIDI, 82 PAGES
- SEND $3.95 & 50¢ P/H FOR YOUR COPY TO: FUTURE MUSIC, BOX 1090, RENO, NV 89504

MASTERCARD & VISA ACCEPTED

ALL PRODUCTS FULLY WARRANTED BY MFG! FOR CUSTOMER SERVICE CALL 702-359-6434 9-9 PDT

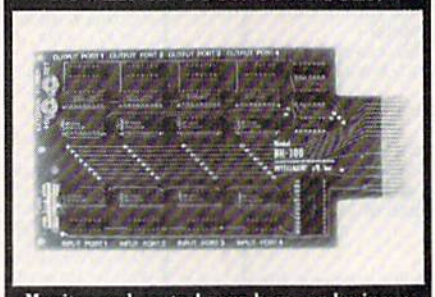
1-800-FOR-MIDI

NEVADA 702-826-MIDI

MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI! MIDI!

Circle 169 on Reader Service card.

DISCOVER THE HIDDEN POWER OF YOUR COMPUTER



Monitor and control your home or business:

- Control lights, appliances, heating/cooling systems, relays, motors and virtually any electrical device.
- Connect to analog-to-digital and digital-to-analog converters, temperature, light, sound or fluid level sensors.
- Use as an advanced security system.
- Perform automated testing and experimentation.
- Use as a laboratory data acquisition system.
- Use for educational purposes.

Provides 8 memory mapped ports:

- Allows access to each port via one statement in BASIC. No interface could be easier to use.
- 4 8-bit buffered output ports (32 separate output lines).
- 4 8-bit input ports (32 separate input lines).
- 8 convenient 14-pin DIP socket interface connectors.
- A/D plug-in conversion module with 100 microsecond sampling time; $25.
- BH100 User Manual includes instructions, sample programs and diagrams of typical hookups.

The BH100 is a very powerful and versatile interface. Do not let the price fool you-

ONLY $129!

Specify C-64, VIC-20 or Apple 2+/2e

Intelligent I/O, Inc.
30 Lawrence Ave, Box 70
Potsdam, NY 13676
(315) 265-6350

Bulk rates available



Photo 2. Students using C-64s in the Augustana College music lab, as described in the May issue.

all of your experiences with others through The Resource Center.

Because there's been so much interest in The Resource Center and because we're limited to only 12 columns a year, I am using telecommunications to get information out to you more quickly. The Resource Center will now also be on QuantumLink for those of you who want to communicate via modem with others who are using Commodore computers for education.

This on-line education SIG (special interest group) will be an extension of The Resource Center in *RUN* magazine and will act as a clearinghouse of information from you, from Commodore, and from national and state education departments. The information will apply to all educators who are looking for advice on how to use computers in the classroom, at home, and in the community, and it will specifically address Commodore computers.

There will be a software library for downloading programs that have been written and tested by educators; public message boards for asking questions, giving answers and otherwise sharing information; and databases of articles and reports on computers in education. There will also be regular on-line conferences, run by myself and guest speakers, in which you can all participate.

If you'd like to contribute your own materials to the software and article databases, please send them to me on disk here at *RUN*. All programs should include the intended user's age or grade level, the subject area covered and how you have been using the programs in your school or home.

Articles (without programs) that discuss your experiences using Commodore computers for education should be sent on disk as a Commodore word processor file.

All materials should include your name, the name of your school and an address. That way, if you don't have a modem, people can contact you via regular mail. (For those of you who already have a modem and are members of QuantumLink, you can upload files to me on-line.)

The materials you contribute will benefit a great many people, will be considered part of the public domain and will be made available only through The Resource Center. We cannot pay for these materials.

I encourage all of you to join this on-line SIG and to continue to contribute your experiences and advice to The Resource Center—whether in *RUN* or on-line. For information about QuantumLink, contact Quantum Computer Services, 8620 Westwood Center Drive, Vienna, VA 22180.

More calls for help

By the way, I am getting many requests for curriculum guides to help schools start integrating computers into their courses. Some of you have already sent me copies of what your school is using. I would like to collect as many curriculum guides as possible, to share with other interested schools. If you've created a guide that you'd like to share with others, please send me a copy.

Also, I'd like to include more photos of students using Commodore computers for education. Please send along such photos and a brief description of the software and the Commodore hardware system being used. I'll try to include these in The Resource Center whenever possible. R

If you are using Commodore computers for educational purposes (at home or at school) and would like to share your experiences through The Resource Center, write me a letter detailing the equipment you're using, the subject areas involved, the age or grade level of your students, software you have found effective and any other information you feel like including. Send letters to:

Margaret Morabito
The Resource Center
c/o RUN *Editorial*
80 Pine St.
Peterborough, NH 03458

You can also leave messages in my on-line mail boxes: CompuServe (70616,-714), Delphi (MARGM) and QuantumLink (MARGM).

List of Commodore's authorized educational dealers.

ALABAMA

ABAX Data Systems
2806B South Memorial Parkway
Huntsville, AL 35801
205-536-7292

Universal Computer Systems
3662B Airport Blvd.
Mobile, AL 36608
205-343-7597

ARIZONA

Copperstate Cash Register
3125 E. McDowell Road
Phoenix, AZ 85008
602-244-9391

Dean Computers
1115 S. Waldron Road
Fort Smith, AR 72903
501-452-7985

ARKANSAS

*SIS
2201 Washington Ave.
Conway, AR 72032
501-327-1375/3313

CALIFORNIA

CBS
10225 Barnes Canyon Road
San Diego, CA 92121
619-455-6114; 800-368-0011

Century Computer Systems
1040 E. Whittier Blvd., Suite 102
La Habra, CA 90631
213-697-6977; 213-694-8426

DuWayne Industries
1100B Pleasant Valley Drive
Pleasant Hill, CA 95423
415-932-4373

KJ Computers
10815 Zelzah Ave.
Granada Hills, CA 91344
818-366-5305

COLORADO

Micro World Electronix
3333 S. Wadsworth Blvd.
Lakewood, CO 80227
303-987-9531

CONNECTICUT

Computer Learning Unlimited
Plaza 44, Suite 20/Box 1038
Avon, CT 06001
203-677-5889

Multi Business Computer System
28 Marlborough St.
Portland, CT 06480
203-342-2747

FLORIDA

Creative Equipment
6864 W. Flagler St.
Miami, FL 33126
305-261-7866

Computer Specialties
726 E. New Haven Ave.
Melbourne, FL 32901
305-725-6574

Florida Book Store
1614 W. University
Gainesville, FL 32604
904-376-6066

GEORGIA

Software South
4 Mall Terrace
Savannah, GA 31406
912-352-3950

TPS/Computer Systems
1803 Wynnton Road
Columbus, GA 31906
404-324-7000

HAWAII

Film Services of Hawaii
205 Kalihi St.
Honolulu, HI 96819
808-847-4474

ILLINOIS

Digitalworld
711 Army Trail Blvd.
Addison, IL 60101
312-543-9000

*Fisher Scientific Co.
4901 W. Lemoyne Ave.
Chicago, IL 60651
312-378-7770; 800-621-4769

*Prescription Learning
5240 S. Sixth Road, Box 2377
Springfield, IL 62705
217-786-2500

R/D Computer Sales
1622 Fourth St.
Peru, IL 61354
815-223-1052

*Tri-State Business Equipment
204 East Locus St.
Harrisburg, IL 62946
618-252-7469

INDIANA

*AVC Corporation
2702 Applegate St., Box 33220
Indianapolis, IN 46203
317-783-6167

*Business & Office Equipment
402 Court St.
Evansville, IN 47708
812-469-9035

IOWA

Micro Computer Applications
19 South Center
Marshalltown, IA 50158
515-752-8845/5096

KANSAS

Midwest Computers
3035 Anderson Road
Manhattan, KS 66502
913-537-4460

KENTUCKY

*Business Equipment Distributors
817 Mill St.
Henderson, KY 42420
502-827-9500

*Business Equipment Distributors
341 3rd St.
Henderson, KY 42420
502-826-8641

*Business Equipment Distributors
2616 Fredricka St.
Owensboro, KY 42301
502-684-8848

Software Source
3034 Bardstown Road
Louisville, KY 40205
502-456-4486

LOUISIANA

*Interstate School Supply
1835 River Road N., Box 3358
Baton Rouge, LA 70821
504-387-5131; 800-272-9800

*Interstate School Supply
2901 Earhart Blvd.
New Orleans, LA 70113
504-581-9500

MARYLAND

Computerworld
2112 Philadelphia Ave.
Ocean City, MD 21842
301-289-4111

Computerworld
519 S. Pinehurst Ave.
Salisbury, MD 21801
301-543-2284

MASSACHUSETTS

Best Business Equipment
269 Lincoln St.
Worcester, MA 01605
617-755-1077

Omnitek Computers
1300 Main St.
Tewksbury, MA 01876
617-851-4580

Tycom
112 Elm St.
Pittsfield, MA 01201
413-442-9771

MICHIGAN

Micro World Computer Center
15084 Middlebelt Road
Livonia, MI 48154
313-427-0251

Micro World Computer Center
248 Summit Ave.
Milford, MI 48042
313-685-7766

Micro World Computer Center
18829 Eureka Road
South Gate, MI 48195
313-285-0101

Micro World Computer Center
28800 Gratiot Ave.
Roseville, MI 48066
313-771-3600

*Newman Audio Visual
400 32nd St. SE
Grand Rapids, MI 49508
616-243-3300



Circle 91 on Reader Service card.

Copy Worldwide Short-wave Radio Signals on Your Computer

Remember the fun of tuning in all those foreign broadcast stations on the short-wave radio? Remember those mysterious sounding coded tone signals that baffled you? Well, most of those beeps & squeals are really digital data transmissions using radioteletype or Morse code. The signals are coming in from weather stations, news services, ships & ham radio operators all over the world. Our short-wave listener cartridge, the "SWL", will bring that data from your radio right to the video screen. You'll see the actual text as it's being sent from those far away transmitters.

The "SWL" contains the program in ROM as well as radio interface circuit to copy Morse code and all speeds/shifts of radioteletype. It comes with a cable to connect to your radio's speaker/earphone jack, demo cassette, and an excellent manual that contains a wealth of information on how to get the most out of short-wave digital DXing, even if you're brand new at it.

For about the price of another "Pac-Zapper" game, you can tie your Commodore 64, 128 or VIC-20 into the exciting world of digital communications with the Micrologic SWL. $64. Postpaid, U.S.

MICROLOG CORPORATION,
18713 Mooney Drive,
Gaithersburg, Maryland 20879.
Telephone: 301 258-8400.



MICROLOG
INNOVATORS IN DIGITAL COMMUNICATION



Circle 151 on Reader Service card.

NEW!!

LEROY'S CHEATSHEET®



COMMODORE 128
KEYBOARD OVERLAYS
NOW AVAILABLE
DIE-CUT- PLASTIC LAMINATED

- ☐ Blanks (set of 3)
- ☐ Basic 7.0
- ☐ Fleet System 2&3
- ☐ WordPro 128
- ☐ Disk 1571
- ☐ Paper Clip 128
- ☐ Easy Script

ONLY **$7.95** EACH

FREE KEYBOARD EXTENDER WITH EACH ORDER

QTY. _____ x $ 7.95 = $ _____
SHIPPING $ 1.00*
6% TAX (PA. ONLY) $ _____
TOTAL $ _____

*U.S. & CANADA $1.00
FOREIGN ORDERS $3.00
CHECK, M.O., MC/VISA
U.S. FUNDS NO C.O.D.
run 6

MC/VISA # _____
EXPIRATION DATE _____
NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____

CHEATSHEET PRODUCTS INC.
P.O. Box 111368 Pgh., PA 15238
(412) 781-1551

ORDER NOW...OR SEE YOUR LOCAL DEALER

NOW GET TRUE DESCENDERS FOR 801, 1525, 803, GP-100, HUSH 80 & SIMILAR PRINTERS

From the Descender ROM People

WILANTA ARTS

SAMPLE ACTUAL SIZE
gypsy
pager
peopl

FEATURING:

- **True descenders**
- **A pleasing alternative**
- **Uniform character formation**
- **No change in graphic capability**
- **No change in software compatibility**
- **No change in printer operation**
- **North American standard font**
- **Complete instructions**
- **Easy installation**
- **No soldering**

$39.95 Cdn $29.95 U.S.

(Please Indicate Your Printer)

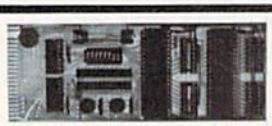
Ont. Residents add 7% Prov. Sales Tax
Cheque, Money Order, Visa or MasterCard

VISA MasterCard

WILANTA ARTS
6943 Barrisdale Dr.
Mississauga Ont.
L5N 2H5

1-416-858-9298

Get a Wilanta Descender ROM Today and make your old nightmare Just a font memory of yesterday!



UNLEASH THE POWER OF YOUR COMMODORE 64 WITH THE ULTIMATE INTERFACE

Compatible with C-128

- Control and monitor your home — appliances, lights and security system
- Intelligently control almost any device
- Connect to Analog-to-Digital Converters
- Control Robots
- Perform automated testing
- Acquire data for laboratory and other instrumentation applications
- Many other uses

Don't make the mistake of buying a limited capability interface. Investigate our universally applicable Dual 6522 Versatile Interface Adapter (VIA) Board, which plugs into the expansion connector and provides:

Four 8-bit fully bidirectional I/O ports & eight handshake lines • Four 16-bit timer/counters • Full IRQ interrupt capability • Four convenient 16-pin DIP socket interface connections • Expandability up to four boards & sixteen ports.

ORDER NOW! Price $169, postpaid USA. Extensive documentation included. Each additional board $149.

All orders shipped from stock within 24 hours via UPS. VISA/MasterCard welcomed.

SCHNEDLER SYSTEMS
1501 N. Ivanhoe, Dept. R6,
Arlington, VA 22305
Information/Telephone Orders (703) 237-4796

RUN CLASS ADS

LOTTERY PLAYERS!

You've got an edge in the Big Money State LOTTOS by using your computer to do a probability study of the past drawings. Don't waste your time with random numbers, this program performs an analysis of the past winning 6 digit numbers and tells you what numbers are due, what groups to play, any trends and much more! It's available on disk with instructions for all states and Canada. COMMODORE 64/128, ATARI, APPLE, IBM & OTHERS. VISA, MC, Checks. Fast Service! $21.95.

SOFT-BYTE
COMPUTER PROGRAMS
P.O. Box 556 Forest Park
Dayton, OH 45405

EMED MEDICAL DATABASE SYSTEM

for the C-64/128
28 Body Areas—325 Symptoms—460 Diseases

Performs diagnosis, XREF diseases by symptom, XREF symptoms by disease, search, & on-line Help Text. Send $29.95 + $2.00 for postage and handling to

DMC SOFTWARE Rt. 1 Box 364 Clinton, LA 70722

dealer inquiries welcome (504) 683-9897

BATTERIES INCLUDED CUSTOMER SUPPORT

BATTERIES INCLUDED

Having problems? Need help? If you have questions about BATTERIES INCLUDED software, call the BI CUSTOMER SUPPORT HOTLINE! Our exclusive support phone number is (416) 881 9816. Our hours are 9 am to 4 pm Monday to Friday. The best time to call—mornings (EST). Worst time to call—Midday! Because this is a free service we must ask that you keep your call brief and to the point. A limit of 5 minutes of free time is permitted per call. If our lines are busy, be patient; if all else fails, please re-read the manual. If you would rather write to us, we'll be glad to send you a personal reply. This service is for registered owners only.

BATTERIES INCLUDED CUSTOMER SUPPORT
30 Mural St., Richmond Hill, Ont., Canada L4B 1B5 (416) 881 9816

***RUN* Class Ad Section**

RUN's New Class Ad section is an opportunity for those with Commodore products to reach *RUN*'s 220,000 readers, at very affordable prices. Considering that *RUN* was the second fastest growing consumer magazine in 1985 (according to the Audit Bureau of Circulation), *RUN*'s circulation is bound to grow even higher in the coming months.

If you have any questions about *RUN*'s Class Ad section, call Heather Paquette at 800-441-4403 or 603-924-9471. We accept checks, money orders, Master Card or VISA.

R The Resource Center

Ye Olde Computer Shoppe
516 W. Cross St.
Ypsilanti, MI 48197
313-482-6382

MISSISSIPPI

*Central School Supply
310 Airport Road, Box 54366
Jackson, MS 39208
601-932-1901

*Mississippi School Supply
4155 Industrial Drive
Jackson, MS 39209
601-948-8600; 800-222-7698

MISSOURI

Kerr Computers/Systems Plus
867 Stanford Drive, Box 925
Sikeston, MO 63801
314-471-5797

Systems Plus Computers
5585 Pershing Ave.
St. Louis, MO 63112
314-361-8825

Systems Plus of Kansas City
12500A Highway 40 E.
Independence, MO 64055
816-373-8984

Systems Plus Computers
64 N. Clark St.
Sullivan, MO 63080
314-468-8081

MONTANA

Applegren Enterprises
901 14th St. N.
Great Falls, MT 59401
406-761-5076

NEVADA

Hotel Computers
376 W. Sahara Ave.
Las Vegas, NV 89102
702-384-9440

NEW JERSEY

Golden Hedge
1334 Brace Road
Cherry Hill, NJ 08034
609-772-0022

Wolsten's Projector House
99 Washington St.
East Orange, NJ 07017
201-678-0008

NEW MEXICO

TEC CON
11460 E. Missouri
Las Cruces, NM 88001
505-526-6029

NEW YORK

*Adwell Audio-Visual
158 Main St., Box 67
Hempstead, NY 11551
516-485-7100

Blumenthal's
234 North Union St.
Olean, NY 14760
716-372-4008

*Compu-Tech Educational Service
615 South St.
Garden City, NY 11530
516-222-1637

Meizner Business Machines
4771 Boston Post Road
Pelham, NY 10803
914-738-6000

Ray Supply
106 E. Main
Malone, NY 12953
518-483-3241

Ray Supply
Bayberry Plaza, Rt. 57
Liverpool, NY 13088
315-622-2551

Ray Supply
Upper Glen St., Box 745
Glen Falls, NY 12801
518-792-5848
800-992-0170 (NY state only)

Ray Supply
439 Cornelia St.
Plattsburgh, NY 12901
518-561-3870

Tedrow Business Products
596 Lake Ave.
Rochester, NY 14613
716-647-2320

NORTH CAROLINA

Triad Computers
3068 Trenwest Drive
Winston-Salem, NC 27103
919-765-0433

NORTH DAKOTA

Ultra
408 Bowen
Bismark, ND 50581
701-258-6689

OHIO

Basic Computer Systems
962 Great East Plaza
Niles, OH 44446
216-652-0056

Computers Plus of Ohio
127 W. Wyandot Ave.
Upper Sandusky, OH 43351
419-294-5723

Computer-Site
14763 Pearl Road
Strongsville, OH 44136
216-572-3580

Day Prom Computer
3460 S. Dixie Highway
Dayton, OH 45439
513-299-8555

Earthrise Micro Systems
1332 Bethel Road
Columbus, OH 43220
614-451-1100

Earthrise Micro Systems
2710 Sawbury Blvd.
Worthington, OH 43085
614-761-1422

Earthrise Micro Systems
1731 Brice Road
Reynoldsburg, OH 43068
614-868-1100

Ohio Office Machines
124 Burkhart Ave.
Cincinnati, OH 45245
513-761-7121

OKLAHOMA

Syntec Micro Systems
2001 Center Point Road N.
Box 217
Wilberton, OK 74587
918-465-5675

OREGON

Computron Business Systems
201 Tigard Plaza
Tigard, OR 97223
503-620-5151

Computron Business Systems
1142 Willagillespie Road
Eugene, OR 97401
503-683-5517

Computron Business Systems
11705 SW Pacific Highway
Tigard, OR 97223
503-639-6780

Computron Business Systems
1139 SW 11th Ave.
Portland, OR 97205
503-224-2220

PENNSYLVANIA

Basic Computer Systems
Lawrence Village Plaza
New Castle, PA 16101
412-652-7717

Basic Computer Systems
2481 East State St.
Hermitage, PA 16148
412-342-5505

Downingtown Computer
719 East Lancaster Ave.
Downingtown, PA 19335
215-269-3025

Pittsburgh Computer Store
47 Clarton Blvd.
Pittsburgh, PA 15236
412-655-8220

PUERTO RICO

The Micro Computer Store
168 Avenue F. D. Roosevelt
Hato Rey, PR 00918
809-754-0670

RHODE ISLAND

International Computer Services
154 Dyerville Ave.
Johnston, RI 02919
401-273-1001

SOUTH CAROLINA

Jack L. Hartman
Koger Executive Center
Enoree Bldg., Suite 217
Columbia, SC 29210
803-772-9448

Software Solutions
1812 Highway 7, Westwood Plaza
Charleston, SC 29407
803-571-BYTE

SOUTH DAKOTA

Triangle School Service
1409 C Ave.
Sioux Falls, SD 57104
605-336-3777

Ultra
1018 14th St. SE
Watertown, SD 57201
605-882-1555

TENNESSEE

*Regency Educational Systems
3716 Hillsboro Road, Suite 100
Nashville, TN 37215
615-282-4228

TEXAS

Regency Educational Systems
7135 W. Tidwell Road, Suite 114
Houston, TX 77092
713-690-7220

*Regency Educational Systems
2318 NW Military Highway
San Antonio, TX 78231
512-342-4876

Regency Educational Systems
4813 Keller Springs Road
Dallas, TX 75248
214-931-5787

VERMONT

Ray Supply
150 Dorset St., Dorset Square Plaza
South Burlington, VT 05401
802-658-9375

VIRGINIA

Jack L. Hartman
2840 Peters Creek Road, Box 6262
Roanoke, VA 24017
703-362-1891

Unidyne Computer Center
536 Independence Blvd.
Virginia Beach, VA 23462
804-499-7166; 855-8037

Virginia Micro Systems
13646 Jefferson Davis Highway
Woodbridge, VA 22191
703-491-6502

WASHINGTON

Computer Corner
1730 Continental Place
Mount Vernon, WA 98273
206-428-1840

Computron Business Systems
64 W. Nob Hill Blvd.
Yakima, WA 98902
509-457-6900

Computer Concepts
1116 Logan Ave.
Cheyenne, WY 82001
307-632-0770

*Education sales and service only.

Circle 101 on Reader Service card.

BUSINESS • SCIENCE • EDUCATION

The complete statistical package for only: **$99**

COMM-STAT™

A Powerful Tool for Data Analysis and Forecasting

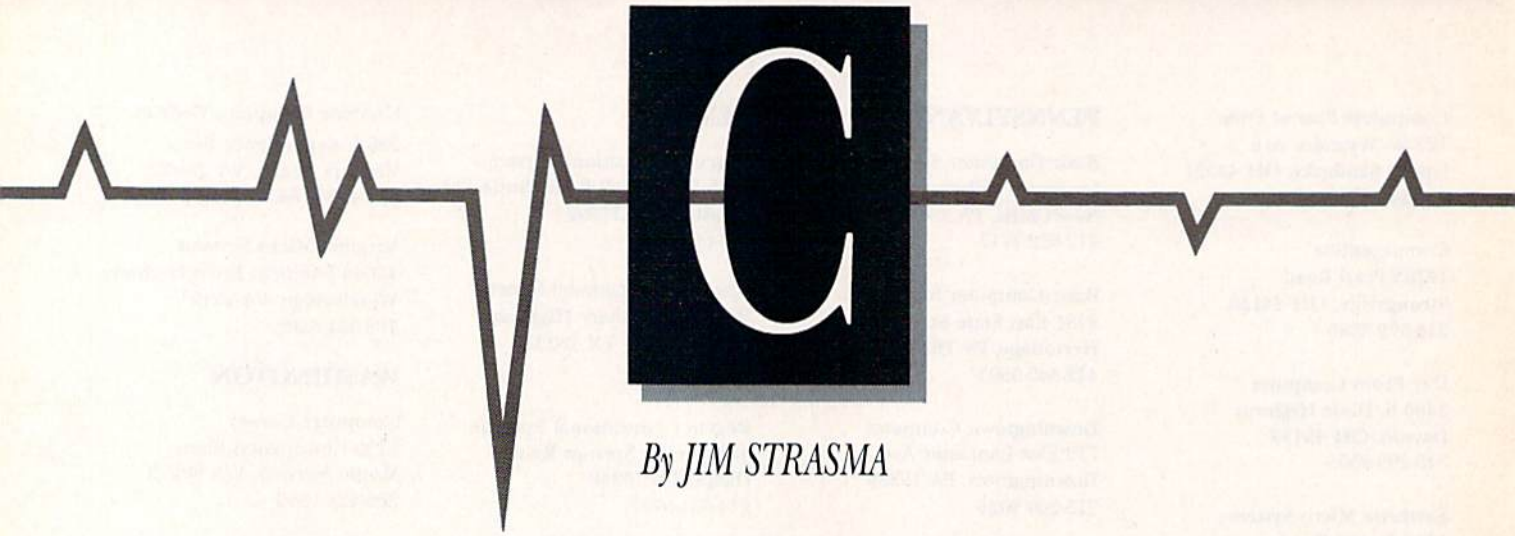
- Easy to use, no commands to memorize (menu-driven)
- Descriptive Statistics, t-tests (independent and dependent samples), General ANOVA/ANCOVA (up to five factors, **unlimited number of cases**, Repeated Measures, unbalanced designs, contrasts, adjusted means, and more), Correlations, Multiple Regression (up to 15 predictors, **unlimited number of cases**), Crosstabulation, Significance Tests, 10 Nonparametric Statistics, and more
- User defined (multiple) conditional selection of subsets of cases, various ways of treating missing data
- Flexible Data Editor, easy entering/editing of data, complex (conditional) transformations of variables, and more
- Can also access files created by spreadsheets and data bases
- Barcharts, Scatterplots, clear comprehensive output
- Will run on COMMODORE-64 (or 128) with 1 disk drive

To order send check or money order for $99 (plus $5.00 shipping and handling) to:

MasterCard StatSoft™ VISA

2832 East 10th Street, Suite 4, Tulsa, OK 74104. (918) 583-4149

ASK ABOUT VERSIONS FOR OTHER COMPUTERS!



By JIM STRASMA

Do you have a problem or question about your Commodore computer? Commodore Clinic can help. Just send your question on a postcard *(limit of one question per card) to:*

Jim Strasma
Commodore Clinic
PO Box 6100
Macomb, IL 61455

Queries are answered only through this column, and, due to the volume of mail, only questions likely to appeal to the majority of our readers can be published.

HARDWARE

***Q:** In examining three of the latest versions of the 1541 disk drive, I found that one had a 6502 chip, another a 6502A and still another a 6502B. Can these be interchanged? And is it all right to install CMOS chips for the 6502 and 6522?*

Earl Long
Joplin, MO

A: Commodore's service manual for the 1541 simply specifies that the 1541 has a 6502, so any of the three versions should work. The A or B at the end of the number indicates that the chip can be used at higher-than-standard clock speeds—two and three MHz, respectively.

As for CMOS substitutes, that is definitely a current trend in the industry. CMOS chips use less power than traditional NMOS chips. Since some 1541s tend to run hot, this can be an important substitution; CMOS chips save about 3 watts of heat in a typical 1541, according to one supplier, K. Boufal of 244 Fitzwater St., Philadelphia, PA 19147 (215-925-6469).

This supplier's recent price for a set of two CMOS 6522s and a 65C02 was $40. Although the new chips are plug-in replacements for the ones now in the 1541, be aware that some copy-protected software may object to the change—particularly to the added commands offered by the 65C02.

***Q:** I am trying to connect Radio Shack's Armatron robot arm to my C-128. Could you send me directions on how to do so? I know a little about the user port and how it works.*

Evan McNish
Findlay, OH

A: I bought an Armatron a year ago, hoping to do exactly the same thing. Unfortunately for both you and me, Armatron's magic is wrought entirely by mechanical gears, not electronics. Worse yet, its very crowded interior does not appear to include enough room for the several solenoids that would be needed to control it electronically.

If you want to try anyway, I'd suggest you start on something less complex. One company that offers a robotics experimenter's board for Commodore user ports is Kobetek Systems, of 1113 Commercial St., New Minas, NS, Canada B4N 3E6. One suitable project for it might be Radio Shack's new Battle Claw radio-controlled tank. It, too, includes a simple robot arm, with the advantage of electronic remote control.

***Q:** I have a Commodore B-128 system, which includes an 8050 dual disk drive. Since I intend to buy a C-128, I would like to know if I can copy data from the 8050 to the 1571 disk drive.*

John Gentilucci
San Francisco, CA

A: Sorry, but you can't do it without buying or borrowing additional equipment. The 8050 has an IEEE-488 interface, and the 1571 has a serial bus interface. The two are similar in function, but not directly compatible.

The simplest way to go between the two formats may be to find access to another drive, preferably the MSD, which accommodates both interfaces. You can then connect the MSD and the 8050 to your B-128. Commodore supplies a unit-to-unit copy program with the 8050 that should be able to copy your files from the 8050 to the MSD. However, you may need to alter the program to work on the B-128, as it was written for the 8032.

Once the files are on the MSD drive, you can run Copyall64 or an equivalent program to copy them into the 1571. If you prefer, you may also put the MSD disk in the 1571.

***Q:** I was going to buy a C-128 computer and a 1571 disk drive until I heard rumors that the 1571 shares the same bug as the 1541 in regard to the @ Save command. Is this true?*

John Menke
Mt. Vernon, IL

A: The bug apparently does not exist in the 1571, but I suggest you don't

Circle 78 on Reader Service card.

HIGH-TECH SEX



Put your sex life in drive with **IntraCourse**, the revolutionary new software program for human sexuality that is sweeping the nation.

Unravel your wildest fantasies with guaranteed confidentiality. Or excite your friends and enliven your next party with **IntraCourse**. Explore each others' sexual personalities. Have **IntraCourse** improve your relationships and compatibility with information and research from more than 100 sources and studies in human sexuality —including Kinsey and Masters & Johnson.

Create your own profile and see where your sexual personality fits on the social continuum of behavior and preferences. Compare your friends. Unshackle your fears with **IntraCourse** and more fully involve yourself in sex.

Endorsed by leading psychologists, **IntraCourse's** 2-disk program is available in IBM, Commodore, Apple and compatible formats for your PC.

Includes interactive sexual questionnaire, sexual compatibility menu, interactive sexual/medical dictionary, public sexuality statistics and information on human sexuality. Order this educational and entertaining software today.

* *"It's going to go through the roof."* — Las Vegas Review Journal

* *"After months of work by a hired team of programmers and psychologists **(IntraCourse)** is about to become computer history."* — Miami Herald

"GET WITH THE PROGRAM"

SPECIAL INTRODUCTORY OFFER: ONLY $49.95, plus tax/handling

CALL TODAY! 1-800-INTRACO/1-800-468-7226 (toll free)

American Express, Mastercharge, VISA, Diners Club, Carte Blanche

IntraCorp 13500 SW 88th Street, Suite 185, Miami, FL 33186 / Allow 2-3 weeks for delivery

INTRACOURSE™ *The "Sexy" Software*

even use the @Save command. On the C-128, scratch any file you wish to replace and then Dsave normally. (Owners of other models can use equivalent Basic 2 commands.)

PROGRAMMING

Q: On p. 16 of my 1541 user's manual (part number 1540031-2), there is a format to combine files. I simply cannot get this to work.

Barry Ashworth
Tucson, AZ

A: In the current 1541 manual (part number 1540031-03), which you can purchase for $5 directly from Commodore, I describe on p. 37 how to combine several already-existing sequential datafiles on the same disk.

Assuming there are three files to be concatenated ("AG", "HM" and "NZ"), each containing the words from part of a short dictionary, the commands to combine them into a single dictionary file ("AZ") are:

```
10 OPEN 15,8,15
20 PRINT#15,"C0:AZ=0:AG,0:HM,0:NZ"
30 INPUT#15,EN,EM$,ET,ES
40 IF EN THEN PRINT EM$:STOP
50 CLOSE 15
```

(Line 20 does most of the work, but lines 30 and 40 are needed to alert you to any problems that arise during the process.)

Unfortunately, this method of concatenating files is only intended for use on datafiles, not program files.

Q: I'd like a C-64 DOS Wedge program that would direct commands to disk drive #9. Any suggestions?

Margaret Matthews
Dallas, TX

A: Load and run the DOS wedge on your demo disk normally. Then simply type @#9 to shift succeeding commands to disk unit 9. This will remain effective throughout your current computer session unless you choose to change it again.

People writing about the DOS wedge on the C-64 often miss this command, because it was added after the original PET version.

REPAIRS

Q: I own a C-64 and use two joysticks. About a month ago, one of the joysticks began malfunctioning; when I push it to the left, nothing happens. I know that the problem is either in the port itself or in the 6526 to which it is connected. How much would it cost to replace one or both, and where would I find them?

Stephen Legate
Los Alamos, NM

A: The problem is probably in the joystick. Remove the screws from the base of the joystick and open the case. Slightly bend the contacts on the inside to get a good circuit and reassemble.

If the joystick checks out all right, get a continuity tester, or ohmmeter, and check for continuity between the pins of port 1 and the pins of the 6526 at U1 on your circuit board. Use the schematic in the *Commodore 64 Programmer's Reference Guide* to be sure which pins should match.

If there is continuity for each pin and no electrical shorts, then the port itself is all right. If continuity is not present, check the solder connections to the main board.

Usually, it is the 6526, not the main board, that is damaged. The damage occurs when the joysticks are inserted with the power on or when the port is touched by a bolt of stray static electricity. If you must replace the 6526, see your nearest authorized Commodore service center, or you can order one for $20 from K. Boufal (mentioned under this column's hardware section, above).

SOFTWARE

Q: I recently bought an Enhancer 2000 disk drive. It works perfectly except that a few programs fail to load, such as Ultrabyte Disk Nibbler V2.0, the Keymaster from Megasoft, and Gemstone Warrior from SSI. I suspect the old "different DOS" problem. If this is the case, can I solve it by using StarDOS from Starpoint Software? It is supposed to be 100% compatible with all C-64 software, and I know Starpoint sells a version for the Enhancer 2000.

Derek Yamamoto
Kailua, HI

A: Unfortunately, StarDOS cannot solve your problem. Even if it completely duplicated Commodore's ROM DOS, it would violate Commodore copyrights, so you can be sure that some programs, such as the ones you mentioned, will still fail to run on your Enhancer 2000, with or without StarDOS.

Q: Where I work, I am used to programming Z80s with a multi-pass assembler. I recently bought a C-128, but I cannot find a multi-pass assembler anywhere. Are there any?

Erik Skyten
Nashua, NH

A: Yes, there are several two-pass assemblers for Commodore computers, and the one I use most, MAE, even offers a third pass to create relocatable object code. It is in many respects equal to the IBM mainframe assembler used here at Western Illinois University.

Unlike some otherwise excellent competitors, MAE is not copy-protected. To order MAE, send $60 to Eastern House Software, 3239 Linda Drive, Winston-Salem, NC 27106.

Q: I need a C-128 program to prepare a drawing or to plot a plan from the description of real estate in deeds and other legal documents. The program should be able to prepare a hard copy of the perimeter of the tract, print the scale of the drawing, the courses and distances of each side, a north indication, and, in the event the description does not close, a closure error. Perhaps you or a reader would be aware of such a program.

Martin Reiley
114 S. Juliana St.
Bedford, PA 15522

A: CadPak, from Abacus Software, is the first package I've seen for the C-128 that might help. It uses simple commands to draw perimeters, a line at a time, and is able to add to the drawing text that describes each line. However, it won't do everything you ask in a fully automatic fashion, so perhaps a reader knows of another program more directly suited to your request. If so, I'd like to hear, too, as yours sounds like a very useful application for the C-128. R

Circle 163 on Reader Service card.

UPGRADE YOUR 64 WITH THESE POWERFUL TOOLS

- ★SUPER BACKUP COPIER
- ★ENHANCED ML MONITOR
- ★MACRO ASSEMBLER
- ★DISK UNASSEMBLER
- ★DATAMAKER TO DISK
- ★DISK SURGEON EDITOR
- ★32 EXTRA COMMANDS
- ★LINE XREFERENCER

SUPER DISK AE X64

$35 US P&P INCLUDED
CANADIAN ORDERS $45
QUEBEC ADD 9%

avantgarde64 ™
1790 TREPANIER, BROSSARD
QUEBEC J4W 2K3, CANADA
PHONE 1-514-672-7060

Circle 180 on Reader Service card.

!!C64 GAME SOFTWARE!!

Boulderdash (Microlab), 16 magical levels with intermissions .....disk $8.95

Moondust (Creative), Unique game with great color & sound .....cart $9.95

Jawbreaker II (Sierra), Wild game of tag in a candy shop .....cart $7.95

Cosmic Tunnels(Datamost), Save the planet! Watch out for JEBS! ...disk $9.95

EDUCATIONAL

Ranch (Spinnaker), Set your own wild west scene, ages 5-10 .....cart $6.95

M-SS-NG- L-NKS (HesWare), Fill in blanks from famous stories! .....disk $6.95

Shipping $2. extra. We have next day turn-around! Any three for $21.!

MOORE'S MICROWARE

417 Persimmon Road
Walnut Creek, CA 94598

Circle 144 on Reader Service card.

Free Spirit Software, Inc.

Order these products for the C64 & C128:

TECHNIQUE! - How to program graphics, animation, sound, music on the C64. Make your own games. Play music like a virtuoso. Disk - $19.95

BASICALLY SIMPLE - How to use all C64 commands and operators in Basic programs. Disk - $14.95

BASICALLY SIMPLE 128 — How to use all C128 commands and operators in Basic programs. C128 only. Disk - $19.95

THE GREAT WAR - WWI Strategy game. Armies of 16 nations in conflict. Your military strategy is conditioned by terrain, political conditions, troop strengths, weaponry, lines of supply. Command Central Powers or Allies vs. computer or other player. An immense struggle of epic proportions. C128 only. Disk - $19.95

POSTMASTER 64 - Simple, efficient mailing list program. Disk - $9.95

POSTMASTER 128 - C128 mailing list program. Disk - $9.95

MUSIC OF THE MASTERS - C64 music appreciation. 20+ works of the great classical composers. Handel, Mozart, Bach & many more. Disk - $9.95

ITALY - Travel, adventure, education game. Learn essential Italian phrases. Disk - $9.95

DUSTCOVERS - High quality, silver-gray vinyl

C64	$6.95	1541 or 1571	$6.95
C128	$7.95	MPS 803	$7.95
1526	$11.95	1702 or 1902	$14.95

FREE SHIPPING AND HANDLING. Send Check or money order to:

Free Spirit Software, Inc.
5836 S. Mozart
Chicago, IL 60629

Illinois residents add 7% sales tax.

Circle 232 on Reader Service card.

Commodore 64 SOFTWARE Only $4/Disk

The Best Public Domain Software from 64 Gold
☐ Printed Directory (93 disks) $2.95
Games, utilities, and more software
☐ Five disk sampler with directory $19.95
Best Games from England
☐ 102 Software Pirates, Triads, Brickbuster, Stellar Strike, Space Arena $4
Space Games
☐ 85 Starwars, Startrek, Eliza, Easy Dungeon, Planet Probe, Deep Space $4
Adam Handball, Grade Book, Math, Typing Tutor
☐ 79 Education, games, utilities $4
Communications, BBS lister, disk doctor
☐ 94,95 Best utilities (2 disks) $8
Directory Sort and function keys, recover files
☐ 80 Cockroach $4
☐ 66 Fast copy (4 minutes) $4

BULK DISKS 59¢ EACH

Foolish to pay more.
Dangerous to pay less.

- Quality media
- Lifetime replacement guarantee
- Write protect tabs
- Hub rings and Tyvec envelopes

Quantity	Item	1-50	51 +	Amount
_____	5.25" SSDD	.69	.59	_____
_____	5.25" DSDD	.79	.69	_____

Add $4 shipping & handling per order. Each additional 100 disks add $3. CA residents add 6.5% sales tax.

Amount enclosed $_____ ☐ Check ☐ VISA ☐ MasterCard

Card No._____

Signature _____ Exp. Date _____

Phone (____)_____

Name _____

Address _____

City _____ State ____ Zip _____

Call toll free **800-431-6249** In Calif. **415-550-0512**

BLACKSHIP COMPUTER SUPPLY F104
P.O. Box 883362 San Francisco, CA 94188

Circle 60 on Reader Service card.

DELUXE RS232 INTERFACE



Whether you want to communicate with a modem, serial printer, another computer, or any other RS232 device, the Deluxe RS232 Interface is the correct choice. Any comparsion will show that it is best Commodore compatible RS232 interface available for any price! The Deluxe RS232 Interface is the culmination of 3 years of working with Commodore users who need an RS232 Interface. It supports all standard RS232 connections (2-8, 12, 20, 22) including Ring Detect and Hi Speed Indicator. Four switches in the RS232 cover allow you to set the unit for virtually any standard RS232 configuration. The unit includes a 3 foot cable with either a male or female DB25 connector (specify which). RS232 plus and minus voltages. Users Manual includes a type-in Basic terminal program, basic program transfer routine, and other examples. Add $2.00 for shipping. Suggested retail **$49.95**

PRINTMASTER/S (RS232)

This is an RS232 version of our famous Printmaster/+G. It is a serial bus printer interface providing full RS232 signals for an RS232 printer. Supports pins 2-8, 20. Select 300, 600, 1200, 2400, word, and parity. Supports dot graphics and characters on RS232 versions of Epson, Oki, Gorilla, NEC, and more. Includes 3 ft cable with a male or female connector (specify which). Cassette or external power. Add $2.50 for shipping. Suggested retail **$119.95**

100% 128 COMPATIBLE
See your local dealer or
CALL (206) 236-2983

30 day money back guarantee on all products. Visa and MC welcome. Write to us if you wish to be on a special marketing survey mailing list.

DEALERS CALL US!

Omnitronix
P.O. BOX 43-DEPT. 9-MERCER IS., WA 98040

Circle 198 on Reader Service card.

DUST COVERS

- ★ CUSTOM MADE TO FIT
- ★ Heavy 32-oz. VINYL ANTI-STATIC
- ★ EXTENDS EQUIPMENT LIFE
- ★ Choice of Colors Lt. Tan or Brown

COMPUTERS
C-64; VIC-20; C-16; Plus 4 ..... 8.00
C-128, B-128 ..... 13.00
DATASSETTE (NEW, C2N) 5.00

DISK DRIVES
C-1541; C-1571 INDUS GT 8.00
MSD S/D; APPLE S/D 8.00
MSD D/D; APPLE D/D UNIT 10.00
ENHANCER 2000 ..... 8.00

PRINTERS
C-1525/MPS801 ..... 10.00
C1526/MPS802 ..... 13.00
C/MPS 803; C-1520 ..... 8.00
PANASONIC KX-P1090/91 ..... 13.00
EPSON MX/RX/FX 80 ..... 13.00
GEMINI 10 & STAR 10's 13.00
GEMINI 15 & STAR 15's 16.00
OKIDATA 91/92 ..... 13.00
OKIMATE 10 ..... 8.00

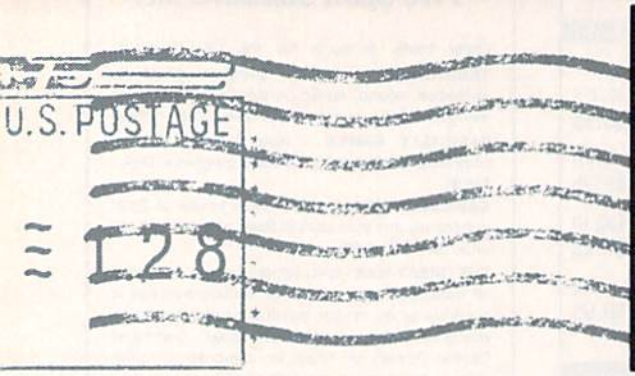
MONITORS
C-1702 ..... 16.00
C-1902/AMIGA 19.00
ZENITH ZVM 122/123 ..... 16.00
AMDEK COLOR I, 500/700 ..... 19.00
TEKNIKA MJ 10/22 ..... 19.00
CM-141 ..... 19.00
BMC COLOR 16.00
VIDEO RECORDERS 13.00
(Dimensions Required)

Order by stating NAME and MODEL and COLOR CHOICE TAN or BROWN.

Enclose check or money order plus $1.50 per item (4.50 max.) shipping and handling. California Res. Include 6.5% Sales Tax.

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONED SKETCH. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES

Crown Custom Covers
9606 SHELLYFIELD RD., Dept. B
DOWNEY, CA 90240
(213) 862-8391



By the Way

I am a new subscriber to your magazine, though not a new reader; a coworker friend of mine has let me read her copies.

I've owned two Timex computer systems in the past few years, and it was largely due to your fine magazine that I decided to switch to Commodore, with the purchase of the C-128 and its associated peripherals. It is an excellent machine for the money.

I am writing mainly to comment on Bob Guerra's review article on productivity software for the C-128 (*RUN*, March 1986). Having purchased all three of the Timeworks programs mentioned in Mr. Guerra's report, I must say that I am glad I made the right choice. I was hoping to purchase the Perfect series that has been promised for so long, but I felt the delay in release was intolerable.

The only criticism I have of Mr. Guerra's report is that he failed to mention one feature of the Timeworks programs that I feel makes them most useful—that they will interface with each other. And in the case of the SwiftCalc program, the Sideways feature can be used with other non-Timeworks software, such as Microsoft Multiplan, Creative Calc and Calc Now, or any that are capable of creative text files in ASCII format.

Richard Ashley
Portsmouth, NH

A Welcome Response

In regard to my article, "Making the Video Connection" (January 1986), I've received phone calls, letters and sample programs from all over the country. These people seem to think I have time to chat with them and to answer their queries—and they're exactly right! I enjoy doing it.

This, I think, is more a tribute to *RUN* than to me. It happens because you and the others at *RUN* have replaced the arcane computing priesthood—open only to adepts—with a kind of camaraderie that makes a reader certain that he or she can call a stranger at the other end of the country and find a kindred soul to talk with.

I think there are a lot of us who feel this way, although we may not always remember to express it. So this is my expression of it. Keep it up.

Erv Bobo
St. Peters, MO

Make a Friend

I am looking for a pen pal with whom to swap games, magazines, tips, etc. I am male, 17 years old, and my main interests are computers, telecommunications, games and utilities.

Amber Butt
702 Bolton Road
Pendlebury
Manchester M27 2EL
England

Call to VIC-20 Owners

I am trying to start a mail-in computer club for VIC-20 users. The club will have great potential. Eventually, I would like it to have its own BBS. I have already made plans for a newsletter, which will include information from people who write to me, as well as reviews of hardware and software. There will probably be a small sign-up fee.

I am interested in hearing from those who have ideas on what they'd like this club to offer. Those interested can write to me. (Please include a self-addressed stamped envelope for a response.) I promise to answer all letters.

Blair Fraser
Box 10, Site D
Bishop's Falls
New Foundland, Canada A0H 1C0

Computer Users Unite

Many perceive mankind's present environment as one of mutual terror. Others deem that such an atmosphere is deplorable. Some hypothesize that we need to build for real peace (e.g., by sports and exchanges). They reiterate that we must increase understanding or contact.

To assist in achieving that goal, two international home computer groups have been formed. Both consist of PC enthusiasts and computer-niks. Most members are hackers/programmers.

The groups, which are made up of a mixture of people, are located in Warsaw and Kracow, Poland. Essentially, we are interested in home computer ideas. Because most members are bilingual, old computer newspapers and magazines are relished. Club members exchange ideas with user's groups from around the world.

Anyone interested in cultural exchange can participate in this unique adventure by writing to: Stephen

Kossecki (02-757 Warsaw, ul. Burgaska 3/24/1, Poland) or Andrew Wiechowski (31-279 Krakow, ul. Lokietka 47/38, Poland) or me.

Benjamin Chapinski
PO Box 176
Vernon, CT 06066

Prisoner of *RUN*

I am a condemned man.

I peck away at my C-128 keyboard like a chicken scrambling for scattered corn.

The shame of it all is that you are to blame for my new condition, having published those troublemakers—64 Perfect Typist, 128 Perfect Typist and ML Perfect Typist. These three utilities have created in me such an insatiable desire for programs that I am not satisfied until I have typed in all of the *RUN* magazine programs at hand.

It is up to you to keep me from having withdrawal pains—by supplying me with more programs. I have visions of *RUN* magazine becoming thicker and thicker until it gets as thick as a Sears catalog. At that time, I expect my fingers will be just stumps. Nevertheless, keep the programs coming, especially educational types.

Antonio J. Benevenutti
St. Thomas, Virgin Islands

C-64 vs. C-128

After rereading my February *RUN*, I decided to write a note. I have the C-128, 1902 monitor and 1571 disk drive. I am glad to see you are beginning to have more articles for the 128 instead of for the 64.

Robert Wessel
Old Hickory, TN

Compared to past issues, your magazine appears to be taking a sharp turn away from covering the 64. I know that you must cover the C-128, but I don't think it's necessary to turn C-64 owners out in the cold.

Alex Perez
Winter Park, FL

We agree, Alex. As we said in the May issue, given the excitement created by the introduction of the C-128, it was tempting to fill the magazine with useful information about the features of this new machine. However, we realize that the larger reader base consists of C-64 owners, and the majority of our editorial coverage will address this group.

Since the introduction of the C-128, a little over a quarter of our editorial has been C-128-related. We feel that this is in keeping with the existing user base. RUN *will continue to be* the *magazine for C-64 owners, while, at the same time, introduce C-128 owners to the features of their new machine.*

Editors

Circle 122 on Reader Service card.

COMPBANK—64

- REPLACES YOUR MANUAL CHECKBOOK.
- PRINTS CHECKS!!!
- STORES DATA FOR LATER USE.
- KEEPS TRACK OF CHECKS OUTSTANDING.
- LISTS BY DATE OR ACCOUNT NUMBER ON SCREEN OR PRINTER.
- AUTOMATIC RECONCILATION.

ORDER COMPBANK—64
$19.95 PLUS $2.00 S&H
FLA. RES. ADD 5% TAX
INCLUDES MANUAL

REQUIRES DISK DRIVE. ALSO REQUIRES ADDITIONAL FORMS TO PRINT CHECKS

VISA CALL 1-800-628-2828 EXTENSION 552 MasterCard

SUNRISE SOFTWARE
8901 NW 26 ST
SUNRISE, FL 33322

Circle 205 on Reader Service card.

VideoFile
FOR HOME VCR USERS

Use your computer to:

- *locate anything you have on your tapes,*
- *generate a list of all recorded items, alphabetically or in order of length,*
- *instantly find the best available space for new materials,*
- *avoid accidental erasures,*
- *convert counter numbers into hrs:minutes,*
- *and much, much more, quickly and effortlessly,*

with **VideoFile,** so logically written and fun to use, any member of the family can learn to use it in minutes. Say goodbye to the messy scraps of paper and scribbled tape boxes, and get **VideoFile!**

Since **VideoFile** is its own best salesman, there's a demo disk for $10.00. Return it and take $10.00 credit towards **VideoFile!** (Sorry, no Apple demo.)

Note new prices: Commodore-64/128: $29.95, Apple][(min. 64K): $39.95, and IBM-PC, compatibles & expanded PCjr: $49.95.

VideoFile
Box 480210, Dept. R7, Los Angeles, CA 90048

☐ Send **VideoFile** disk:
☐ *C-64/128 ($29.95)* ☐ *Apple][($39.95)* ☐ *IBM-PC ($49.95)*

☐ Send **VideoFile** demo disk. ($10.00):
☐ *C-64/128* ☐ *IBM-PC*

Name .....
Address .....
City ..... State .... Zip .....
(CA residents must include 6½% sales tax)

Circle 220 on Reader Service card.

And your Earls and Viscounts. If you've got royal ancestors, we have the noble software that can help you trace them down.

Family Roots and your Apple, IBM, Commodore, Kaypro*, and many others, offer individual and group sheets, charts, name indices, general search and text capabilities. Adapts to most disk drives, printers, and screens. You get more utility programs, plus lots of personal control. A comprehensive (new) manual is included.

Put up your dukes!

All for just $185.

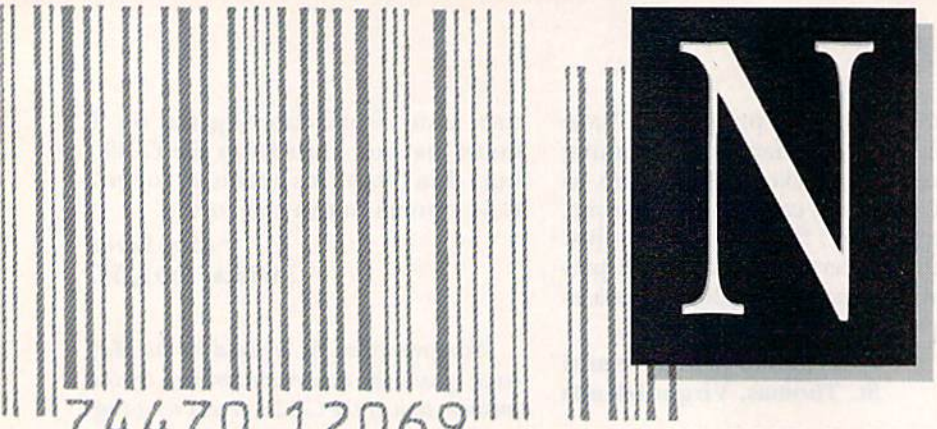
Write or call today for more information and a free brochure.

Quinsept, Inc.
P.O. Box 216
Lexington, MA 02173
(617) 641-2930

American Express, Visa, and MasterCard gladly accepted.

Family Roots

* *Trademarks for Apple Computer Inc., International Business Machines, CBM, Inc. and Digital Research.*



Compiled by HAROLD R. BJORNSEN

Partner 128

Timeworks (444 Lake Cook Road, Deerfield, IL 60015) has released Partner 128, a collection of desktop organization accessory programs for the C-128.

The programs include: a business calculator, memo pad, appointment calendar and datebook, typewriter, address book, phone book and screen print accessory. Partner 128 is available on disk for $59.95.

Check Reader Service number 403.

—•—• —••— —•—• —••—
—•—• —••—

Uncle Bill's Code Course is a three-part Morse code tutorial for the C-64. As you advance through the course, the computer's audio/visual capabilities introduce you to each Morse code character, drill you in responding to Morse code characters and help you practice your response speed to messages in Morse code. The Code Course is available on disk for $9.95. Uncle Bill's Software, PO Box 2403, Falls Church, VA 22042.

Check Reader Service number 404.

Jeu de Mots

If you want to enlarge your French vocabulary, Gessler Educational Software (900 Broadway, New York, NY 10003) has released French Micro Scrabble, based, *cela va sans dire*, on the popular board game. Up to four players can compete against one another, or you can play against the computer in one of four skill levels.

If you want an English translation of the French phrases in this announcement—sorry—you'll just have to learn French. Available on disk for the C-64 for $39.95.

Check Reader Service number 405.

Out-Think

Kamasoft (2525 SW 224th Ave., PO Box 5549, Aloha, OR 97007) introduces Out-Think, an outline processor for the C-128 in CP/M mode.

Out-Think lets you classify text into an outline structure and then alter and access the text. It allows you to focus on how your main ideas fit together as you create and develop your ideas.

In addition, Out-Think offers a full-screen text editor for inserting and editing text in the outline. A full complement of copy and move operations are provided, including copying within and between outlines. The program requires at least one 1571 disk drive, and it is available on disk for $49.95.

Check Reader Service number 400.

I Am Your Robot

Multibots (Multibotics, 2561 South 1560 West, Woods Cross, UT 84087) are a new line of electronic-robotic experiment and construction sets for the C-64 that, among other things, teach the principles and theory of computer-controlled robotics and facilitate experiments and projects in speech and audio digitization. Multibots also allow you to create hundreds of projects and devices. The sets range in price from $59.95 to $199.95.

Check Reader Service number 414.

Hup! 53281 + 54272

Math Football (Gamco, PO Box 1911, Big Spring, TX 79721) combines football action, whole-number drill and a student/program management system that one or two students may play in a choice of four playing levels: addition and subtraction, multiplication, division or mixed operations. On each play, students may choose among easy, medium or difficult problems.

The program management system allows you to adjust the total playing time and set time limits for answering problems. The student management system records students' names, playing levels and number of problems answered correctly in each category of difficulty. Available on disk for the C-64 for $39.95.

Check Reader Service number 415.

General-Purpose I/O Card

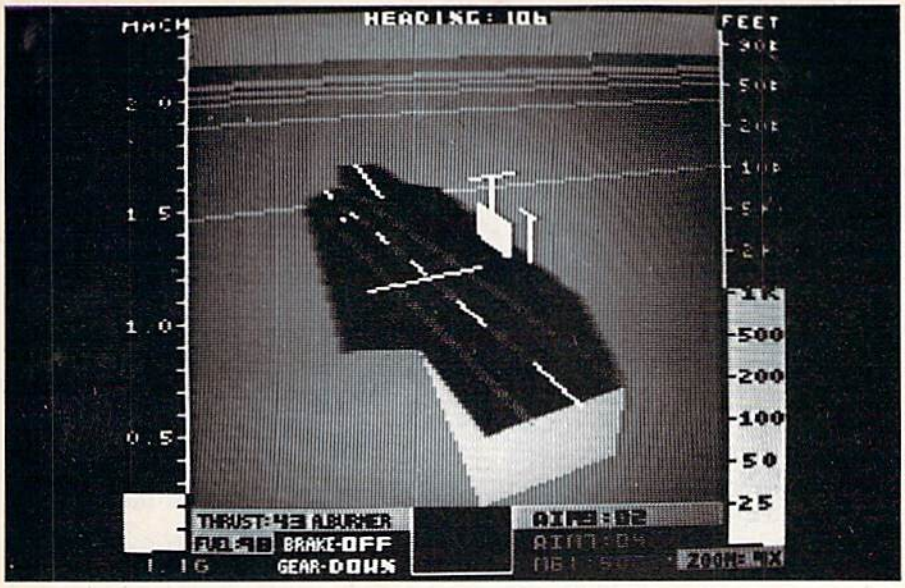
Intelligent I/O (30 Lawrence Ave., Potsdam, NY 13676) has released its BH100 General-Purpose I/O Card for the C-64, C-128 and VIC-20 computers.

The card, which plugs into the memory expansion port, allows you to control lights, appliances, heating or cooling systems, relays and motors. It connects to the manufacturer's a/d and d/a converters and to temperature, light and sound sensors. The I/O card can also control robots and security systems. Available for $129.

Check Reader Service number 411.

Commodore Coloring Book

Mindscape (3444 Dundee Road, Northbrook, IL 60062) introduces



Screen shot of Jet, from SubLogic.

Colorme: The Computer Coloring Kit, which allows young children to design pictures, coloring books and stickers on the C-64 and then print them out. The kit also includes a Rainbow Brite picture disk. Available on disk for $34.95.

Also available are Colorme Picture Disks featuring Shirt Tales, Hugga Bunch and Tink!Tonk! characters, and the Colorme Supply Box, which comes with assorted buttons and color printing papers. The Picture Disk and the Supply Box are $9.95 each.

Check Reader Service number 401.

Teacher's Aide

The Teacher's Aide, from T'Aide Software (PO Box 65, El Mirage, AZ 85335), lets you print out exercises in basic mathematics and algebra with your C-64 and compatible dot-matrix printer.

The basic mathematics programs feature all operations applicable to integers, decimals, fractions and percent; the algebra programs include linear equations with one or two variables, quadratics, fractional equations and signed and complex number arithmetic. Available on disk for $100.

Check Reader Service number 413.

Into the Wild Blue Yonder

Jet is a flight simulator for the C-64 that simulates two fast and maneuverable supersonic jet fighters: a land-based F-16 fighting Falcon and a carrier-based F-18 Hornet.

The program includes a free-flight noncombat mode and offers a variety of land and sea strike and dogfight options to test your skills under different combat conditions.

The aircraft are equipped with "heads up" displays for monitoring instruments and environment simultaneously, and the displays provide you with full-screen, out-the-window views. Jet is compatible with all Scenery Disks and is available on disk for $39.95 from SubLogic, 713 Edgebrook Drive, Champaign, IL 61820.

Check Reader Service number 410.

128 Software

Free Spirit Software (5836 S. Mozart, Chicago, IL 60629) has released C-128 versions of two of its software packages.

Basically Simple 128 is for programming in Basic and includes instructions in the use of the additional commands available on the C-128. On disk for $19.95.

Postmaster 128 stores, retrieves and sorts names, addresses, Zip codes and phone numbers. It also takes advantage of the 128's increased storage capacity. Available on disk for $9.95.

Check Reader Service number 406.

Organ Recital

Inside Story—The Anatomy Learning System, from Access Software (#A 2561 South 1560 West, Woods Cross, UT 84087), allows students to study human physiology and view specific organs or parts of the body on 50 high-resolution screens.

Multiple-choice quizzes and final exams allow you to test your students and store and print out test scores. Available on disk for the C-64 for $34.95.

Check Reader Service number 407.

Commodore Chemistry

Chem Lab puts young chemists ages 9–12 in command of a chemistry laboratory on their C-64s. The program contains 50 experiments involving thousands of chemical combinations.

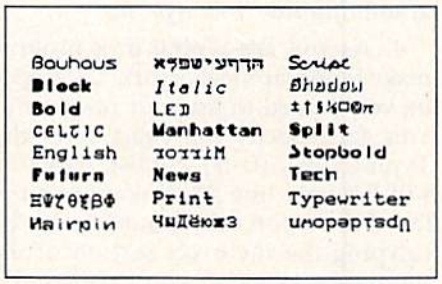
In each experiment, students mix, heat and combine chemicals on screen in order to solve chemistry problems. Available on disk for $39.95. Simon & Schuster, 1230 Avenue of the Americas, New York, NY 10020.

Check Reader Service number 408.

How Would You React?

Alter Ego (Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043) is a role-playing game in which your C-64 poses questions about life outside your realm of experience. You answer as you think another person might, or you give your own answers. The program then tells you the outcomes of your responses. Available on disk for $49.95.

Check Reader Service number 409.



Sample fonts, from xetec.

Weird Characters

Fontmaster II, an improved version of the original Fontmaster word processor from Xetec (2804 Arnold Road, Salina, KS 67401), has 30 different print styles for your C-64.

In addition, it has over 65 text-editing commands, a grid for creating characters, on-screen status display, 80-column video preview, help screens and right-to-left editing features for use with foreign languages. Available on disk for $49.95.

Check Reader Service number 402.

Learn to Walk Before You RUN

We receive many letters from new Commodore owners who want to learn the first steps in using their computers. For these first-time users, we present the following step-by-step list of things that all beginners should be aware of as they start typing in programs.

1. Before you can use a fresh disk, you have to format it. First turn on your disk drive, then insert the disk, close the latch and type:

```
OPEN15,8,15 <Press Return>
PRINT#15,"N0:NAME,##" <Press Return>
```

The ## is a two-character identification number that can be any combination of letters and/or digits. "NAME" can be any title for your disk that you choose, but it must not exceed 16 characters. Wait for a few minutes while the disk spins inside the drive, being formatted. When the disk stops spinning, type:

```
CLOSE15 <Press Return>
```

C-128 owners can shorten this procedure by simply typing:

```
HEADER "NAME,##" <Press Return>
```

Caution: The formatting process erases all material already on the disk, so if you're formatting a used disk, make sure it doesn't contain any programs you want to save. See item 7, below, on reading the disk directory.

2. As a beginner, you should start entering short Basic programs. Avoid machine language listings and very lengthy Basic programs until you get the hang of what you're doing. We have a checksum program (Perfect Typist) which actually proofreads your typing and tells you when you make a mistake. You should type in Perfect Typist before you enter any programs. See directions below.

3. Remember to press the return key after each programming line you type in.

4. As you are typing in a program, you are likely to make typographical errors. To check what you have typed in, you'll need to list your program's lines on the screen. You can specify the exact lines that you want to see. Typing LIST 10–50 will list lines 10 through 50. LIST 20 will list only line 20. If you see an error in one of your listed lines, you can fix it by using the INST/DEL key and retyping the incorrect section of the line. Always press the return key after you have fixed a line.

5. Be sure to save what you have typed in before turning off your computer. To save any partial or complete Basic program listing to your disk, type:

```
SAVE "NAME",8 <Press Return>
```

C-128 owners can press F5, type in the program name, and press the return key.

Note: As you save subsequent versions of the same program, you need to make a slight change in the program name each time. You might simply add version numbers to the end of the program name (PROGRAM.1, PROGRAM.2, etc.).

6. While working on a program, you may develop several versions before you're satisfied that you have it in final form. After you *do* achieve that final version, you might want to go back and erase the old, incomplete versions from your disk. Erasing unwanted programs is called scratching. (Be sure not to erase your final version!) To scratch a program, type:

```
OPEN15,8,15 <Press Return>
PRINT#15,"S0:prog.name" <Press Return and wait a few seconds>
CLOSE15 <Press Return>
```

7. After you have saved several programs to your disk, you will need to see their names so that you can load the one you want. To get the complete list (the disk directory) of all the program names on your disk, type:

```
LOAD "$",8 <Press Return>
```

Then type LIST to actually see the directory. C-128 owners simply press F3.

8. When you know what program you want to load into your computer, type:

```
LOAD "NAME",8 <Press Return>
```

C-128 owners can just press F2, type in the program name, and press the return key.

9. After you have loaded a program, type RUN to actually use the program.

How to Type Listings from *RUN*

To simplify your typing of *RUN*'s C-64 and C-128 program listings, we include checksum numbers. These numbers follow a REM statement at the end of each line (e.g., :REM*123). These checksum numbers necessitate your using *RUN*'s Perfect Typist programs, listed below. Use 64 Perfect Typist for C-64 programs and 128 Perfect Typist for 128 Mode programs on the C-128.

Type in 64 Perfect Typist (Listing 1) or 128 Perfect Typist (Listing 2) and save it to either tape or disk before running. When you want to type in a 64- or a 128-mode program, first load and run the appropriate Perfect Typist listing. Two SYS numbers will be displayed on your screen. Jot these down and keep them handy. They are the SYS numbers that you type in for deactivating and reactivating the checksum program.

After Perfect Typist has been loaded and run, start typing in the program listing from *RUN* as you normally do. The only difference is that now, after you press the return key to log in each line, a 1-, 2- or 3-digit number will appear below the line on the left margin. This is the checksum number, ranging from 0 to 255.

If this number matches the checksum number printed in the listing after the :REM*, then you know you have typed that line correctly. Then you type the next program line right over the previous line's checksum value. If the checksum numbers do not agree, analyze your line on screen for any typographic errors or omissions. Make the needed changes and press the return key again to log in those changes. A new checksum number will appear in place of the old one. Compare this to the magazine's number and then proceed to the next line.

When you've finished typing in your program, disable the Perfect Typist by typing in the appropriate SYS number for either 64 or 128 mode, and press the return key. Now you can save your program as usual, to disk or tape. (Before you attempt to run your new program, turn your computer off and back on to completely clear out the Perfect Typist program.)

You may save an incomplete program any time and continue it later. You will have to reload and run the Perfect Typist program, then load the incompleted pro-

gram that you were working on, list it, and continue where you left off.

The 128 Perfect Typist will work in either 40 or 80 columns. Also, it lets you use the C-128's automatic line-numbering. If Auto is on, the checksum will be printed below the line you just entered, and the C-128 will place the next line number below the checksum.

All listings in *RUN* have been translated so that the graphics and control characters are designated as understandable key combinations. When you see instructions inside curly brackets, such as {SHIFT L}, you should hold down the shift key and press the L key. What you see on your screen will look quite different from what is designated inside the brackets. Another example is {22 SPACEs}, which instructs you to press the space bar 22 times.

Listing 1. *64 Perfect Typist program.*

```
1 REM 64 PERFECT TYPIST
2 REM
3 REM WRITTEN BY:
4 REM JAMES E. BORDEN
5 REM 641 ADAMS ROAD
6 REM CARLISLE, PA 17Ø13
7 REM
1Ø POKE56,PEEK(56)-1:POKE52,PEEK(56):CLR
2Ø PG=PEEK(56):ML=PG*256+6Ø
3Ø FORX=ML TO ML+154:READD:T=T+D:POKEX,D:NE
   XT
4Ø IFT<>16251 THEN PRINT"ERROR IN DATA...":
   END
6Ø POKEML+4,PG:POKE ML+1Ø,PG:POKE ML+16,PG
7Ø POKE ML+2Ø,PG:POKE ML+32,PG:POKE ML+38,P
   G
8Ø POKE ML+141,PG
89 PRINT"{SHFT CLR}{CRSR RT}**************
   **********************"
9Ø SYS ML:PRINT "{CRSR RT}** 64 PERFECT TYP
   IST IS NOW ACTIVE{2 SPACEs}**"
1ØØ PRINT "{CRSR RT}** SYS"ML"=ON{5 SPACEs}
    SYS"ML+3Ø"=OFF **"
1Ø1 PRINT"{CRSR RT}**********************
    **************":NEW
11Ø DATA 173,ØØ5,ØØ3,2Ø1,ØØ3,2Ø8,ØØ1,Ø96
12Ø DATA 141,1Ø5,ØØ3,173,ØØ4,ØØ3,141,1Ø4
13Ø DATA ØØ3,162,1Ø3,16Ø,ØØ3,142,ØØ4,ØØ3
14Ø DATA 14Ø,ØØ5,ØØ3,Ø96,234,234,173,1Ø4
15Ø DATA ØØ3,141,ØØ4,ØØ3,173,1Ø5,ØØ3,141
16Ø DATA ØØ5,ØØ3,Ø96,Ø32,124,165,132,Ø11
17Ø DATA 162,ØØØ,142,24Ø,ØØ3,142,241,ØØ3
18Ø DATA 189,ØØØ,ØØ2,24Ø,Ø51,2Ø1,Ø32,2Ø8
19Ø DATA ØØ4,164,212,24Ø,Ø4Ø,2Ø1,Ø34,2Ø8
2ØØ DATA ØØ8,Ø72,165,212,Ø73,ØØ1,133,212
21Ø DATA 1Ø4,Ø72,238,241,ØØ3,173,241,ØØ3
22Ø DATA Ø41,ØØ7,168,1Ø4,Ø24,Ø72,Ø24,1Ø4
23Ø DATA Ø16,ØØ1,Ø56,Ø42,136,Ø16,246,1Ø9
24Ø DATA 24Ø,ØØ3,141,24Ø,ØØ3,232,2Ø8,2ØØ
25Ø DATA 173,24Ø,ØØ3,Ø24,1Ø1,Ø2Ø,Ø24,1Ø1
26Ø DATA Ø21,141,24Ø,ØØ3,169,Ø42,Ø32,21Ø
27Ø DATA 255,169,ØØØ,174,24Ø,ØØ3,Ø32,2Ø5
28Ø DATA 189,162,ØØ3,189,211,ØØ3,Ø32,21Ø
29Ø DATA 255,2Ø2,Ø16,247,164,Ø11,Ø96,145
3ØØ DATA Ø13,Ø32,Ø32
```

Listing 2. *128 Perfect Typist program.*

```
1 REM 4Ø/8Ø COL 128 MODE PERFECT TYPIST
2 REM
3 REM WRITTEN BY:
4 REM JAMES E. BORDEN
5 REM 641 ADAMS ROAD
6 REM CARLISLE, PA 17Ø13
7 REM
1Ø FORX=512ØTO5379:READD:T=T+D:POKEX,D:NEXT

2Ø IFT<>28312 THENPRINT"{2 CRSR DNs}ERROR I
   N DATA...":END
25 A$="":IFPEEK(215)=128THENA$="{2Ø SPACEs}
   "
3Ø PRINT"{SHFT CLR}"A$"{CRSR RT}**********
   **************************"
4Ø PRINTA$"{CRSR RT}** 128 PERFECT TYPIST I
   S NOW ACTIVE **"
5Ø PRINTA$"{CRSR RT}**{2 SPACEs}SYS 512Ø=ON
   {7 SPACEs}SYS 515Ø=OFF{2 SPACEs}**"
6Ø PRINTA$"{CRSR RT}**********************
   ***************":SYS512Ø:NEW
512Ø DATA 173,ØØ5,ØØ3,2Ø1,Ø2Ø,2Ø8,ØØ1,Ø96,1
     41,Ø45
513Ø DATA Ø2Ø,173,ØØ4,ØØ3,141,Ø44,Ø2Ø,162,Ø
     43,16Ø
514Ø DATA Ø2Ø,142,ØØ4,ØØ3,14Ø,ØØ5,ØØ3,Ø96,2
     34,234
515Ø DATA 173,Ø44,Ø2Ø,141,ØØ4,ØØ3,173,Ø45,Ø
     2Ø,141
516Ø DATA ØØ5,ØØ3,Ø96,Ø32,Ø13,Ø67,14Ø,255,Ø
     19,162
517Ø DATA ØØØ,142,252,Ø19,142,253,Ø19,142,2
     54,Ø19
518Ø DATA 189,ØØØ,ØØ2,2Ø1,Ø32,24Ø,Ø08,2Ø1,Ø
     48,144
519Ø DATA ØØ7,2Ø1,Ø58,176,ØØ3,232,2Ø8,238,1
     89,ØØØ
52ØØ DATA ØØ2,24Ø,Ø54,2Ø1,Ø32,2Ø8,ØØ5,172,2
     54,Ø19
521Ø DATA 24Ø,Ø42,2Ø1,Ø34,2Ø8,Ø1Ø,Ø72,173,2
     54,Ø19
522Ø DATA Ø73,ØØ1,141,254,Ø19,1Ø4,Ø72,238,2
     53,Ø19
523Ø DATA 173,253,Ø19,Ø41,ØØ7,168,1Ø4,Ø24,Ø
     72,Ø24
524Ø DATA 1Ø4,Ø16,ØØ1,Ø56,Ø42,136,Ø16,246,1
     Ø9,252
525Ø DATA Ø19,141,252,Ø19,232,2Ø8,197,173,2
     52,Ø19
526Ø DATA Ø24,1Ø1,Ø22,Ø24,1Ø1,Ø23,141,252,Ø
     19,169
527Ø DATA Ø42,Ø32,241,Ø2Ø,Ø32,188,Ø2Ø,16Ø,Ø
     Ø2,185
528Ø DATA 185,Ø2Ø,Ø32,241,Ø2Ø,136,Ø16,247,1
     65,116
529Ø DATA 2Ø8,ØØ9,165,117,2Ø8,ØØ5,169,145,Ø
     32,241
53ØØ DATA Ø2Ø,172,255,Ø19,Ø96,Ø13,Ø32,Ø32,1
     62,ØØØ
531Ø DATA 173,252,Ø19,232,Ø56,233,1ØØ,176,2
     5Ø,1Ø5
532Ø DATA 1ØØ,2Ø2,24Ø,ØØ3,Ø32,232,Ø2Ø,2Ø1,Ø
     1Ø,176
533Ø DATA ØØ5,2Ø5,252,Ø19,24Ø,Ø15,162,ØØØ,2
     32,Ø56
534Ø DATA 233,Ø1Ø,Ø16,25Ø,Ø24,1Ø5,Ø1Ø,2Ø2,Ø
     32,232
535Ø DATA Ø2Ø,17Ø,Ø72,138,ØØ9,Ø48,Ø32,241,Ø
     2Ø,1Ø4
536Ø DATA Ø96,17Ø,173,ØØØ,255,Ø72,169,ØØØ,1
     41,ØØØ
537Ø DATA 255,138,Ø32,21Ø,255,1Ø4,141,ØØØ,2
     55,Ø96
```

List of Advertisers

Reader Service		Page
8	Abacus Software	35,37
7	Access Software	87
*	Aprotek	44,55
163	Avantgarde 64	105
157	Basix Softworxs	63
*	Batteries Included	23
134	Berkeley Softworks	CII, 1
232	Blackship Computer Supply	105
14	Brady Computer Books	67
85	Cardco, Inc.	CIII
192	Cardinal Software	91
81	Central Point Software	47
*	Cheetsheat Products	99
*	C.O.M.B.	77
*	Computer Ctrs. of America	2,3
55	Computer Creation	46
274	Computer Friends	80
*	Commodore Business Machines	CIV
64	Compuserve	24,25
*	Covox, Inc.	34
198	Crown Custom Covers	105
105	Data Share, Inc.	69
214	D.B. Software	27
128	Digital Vision	95
3	Electronic Arts	13,45
156	Emerald Components	83
12	Epyx, Inc.	15
104	Firebird Software	28,29
120	Fishertechnik	22
107	Firstline Software	43
144	Free Spirit Software	105
350	Floppy House Software	91
125	Future Music	96
*	GE Information Services	65
9	H&E Computronics	49
169	Intelligent I/O	96
*	Intelligent Software	95
78	Intra Corp.	103
202	Jason-Ranheim	81
197	Jacobsen Soft. Design	87
126	Ketek	26
*	Lyco Computer	79
189	Megasoft Ltd.	50,51
47	Micro Computer Games	9
82	Micro-Pace Distributing	81
91	Microlog Corporation	99
68	Microprose	17
180	Moore's Microware	105
*	Navarone Industries	98
184	N.P.S. Inc.	47
*	Omegasoft Software	47
60	Omnitronix	105
141	Precision Periph. & Software	7
93	Professional Software	19
74	Prof. Jones	91
223	Pro-Tech-Tronics	33
15	Protecto Enterprizes	72,73
220	Quinsept	107
*	RUN	
	RUN Subscriptions	48
	ReRUN Bi-Monthly	80
	ReRUN Library	68
	ReRUN Productivity Pak	97
	Universal Microfilm	64
	Jessie Jones	64
	Moving	81
	RUN Back Issue	87
	Mail list	111
*	Schnedler Systems	99
90	Skyles Electric Works	83
254	Software Discounters of America	95
101	Stat Soft	101
26	SubLogic	21
122	Sunrise Software	107
302	Tailored Solutions	87
75	TC Electronics	91
155	Tenex Computer Express	75
209	Tussey Computer Products	10,11
132	Ultrabyte	87
121	Value Soft	71
205	Video Files	107
97	White House Computers	61
151	Wilanta Arts	99
96	Xetec, Inc.	47

For further information from our advertisers, circle the corresponding Reader Service number on the Reader Service card.

*This advertiser prefers to be contacted directly.

Advertising Sales:
Steve Robbins; Ken Blakeman;
Nancy Potter
(603)-924-7138 or (800)-441-4403;

West Coast Sales Office:
Giorgio Saluti
(415)-328-3470 or (800)-227-8365
In Calif.: (800)-344-4636

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

July

COMING ATTRACTIONS

- **Special Graphics Section**—The July issue focuses on your C-64 and C-128.
  —Some eye-catching video stunts for your C-128 to perform.
  —Find out how an artist-businessman uses his C-64 system creatively and practically.
  —Placing text on your hi-res screen has never been easier.
  —If you enjoy design-related crafts, you'll appreciate this Needlegraph program.

- **PaperClip II**—Review of Batteries Included's newest word processor/terminal program for the C-128.

- **Commodore New Product Releases**—Announcing a "new" C-64, memory-expansion modules, a mouse, a C-64 3½-inch disk drive and a new modem.

- **Electronic Newsletter**—Is writing a newsletter for your user's group or small business becoming a time-consuming and expensive burden? You'll be able to save yourself some paper and pain by putting it all on disk with this desktop publishing program.

Circle 85 on Reader Service card.

Now, a "Sidekick" for your Commodore 64!

HIDDEN ASSETS



HIDDEN ASSETS makes the C-64 respond to your every thought. Just like Sidekick™, the most popular IBM/PC software in history, HIDDEN ASSETS puts many powerful utilities at your fingertips. HIDDEN ASSETS is totally transparent, so it responds instantly to your command — almost as an extension of your very thoughts!

Whenever you need to make a note, find a phone number, or remember an appointment, HIDDEN ASSETS responds immediately . . . no matter what program's in your computer. Need to schedule a meeting, or do a calculation? HIDDEN ASSETS is at your service! And it has a high-resolution screen dump, with on-line programming utilities and disk utilities!

At your command, HIDDEN ASSETS returns to the computer's main program, exactly where you left off.

The Wizards from the Land of Oz have done it again!

CARDCO, Inc. / 300 S. Topeka / Wichita, KS 67202

Sidekick is a registered trademark of Borland International, Inc.

SHOULDN'T THE COMPUTER THAT'S IN THEIR OWN ROOM BE IN THEIR SCHOOLROOM, TOO?

Learning begins at home. And the computer that's in more homes than any other is Commodore.® So it makes perfect educational sense to put Commodore personal computers in your classrooms, too. You provide your students with a more integrated learning experience and a more valuable one, thanks to Commodore's unusually broad choice of educational applications and software in a wide variety of subjects.

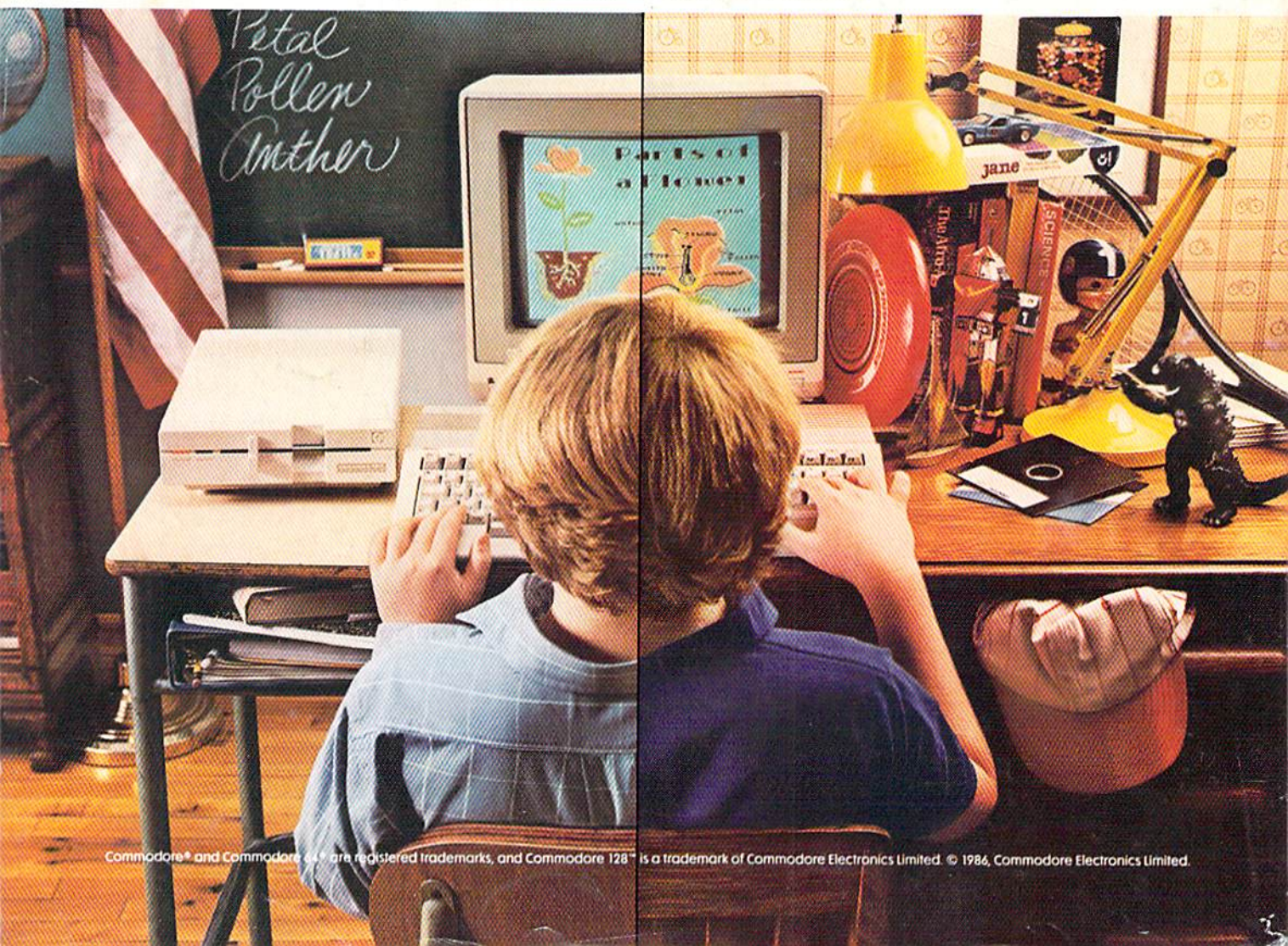
On the subject of value, Commodore computers are priced low enough to allow you to put more students on computers for less money than any other leading brand. What's more, the Commodore 64® and Commodore 128™ afford you a choice of some 2,000 quality educational programs, including those of the leading software manufacturers, MECC, Scholastic and Hayden. And Commodore's performance is backed by an extensive school service network.

Think of it this way: the best way to keep kids interested in school is to make them feel at home. With the computer they use at home. Commodore. The best-selling personal computer in the world.

For more information, write to: Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380, Attention: Education Department.



COMMODORE



Commodore® and Commodore 64® are registered trademarks, and Commodore 128™ is a trademark of Commodore Electronics Limited. © 1986, Commodore Electronics Limited.