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

RUN

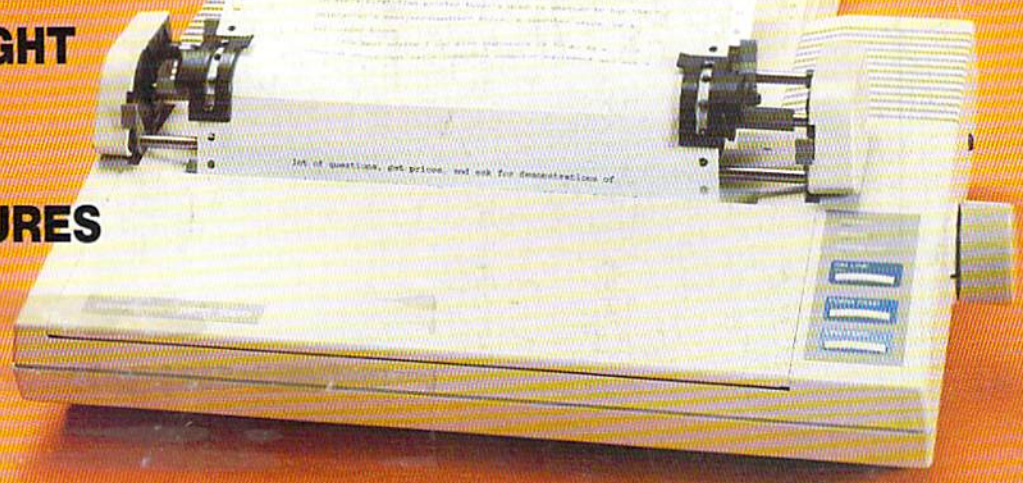
Add the Power Of Your Printer to C-128 Ultra Hi-Res Graphics

U.S.A. $2.95
CANADA $3.95

May 1986 *A CWC/I Publication*

SPECIAL REPORT ON PRINTERS

- WHAT'S AVAILABLE
- CHOOSING THE RIGHT PRINTER AND INTERFACE
- MAXIMIZING FEATURES



0 74470 12069 05

Circle 19 on Reader Service card.

New toll free number:
1-800-541-1541



KEY MASTER

One of the easiest-to-use, most powerful disk backup program 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 **FILE 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.

With 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.

With Two 1541:

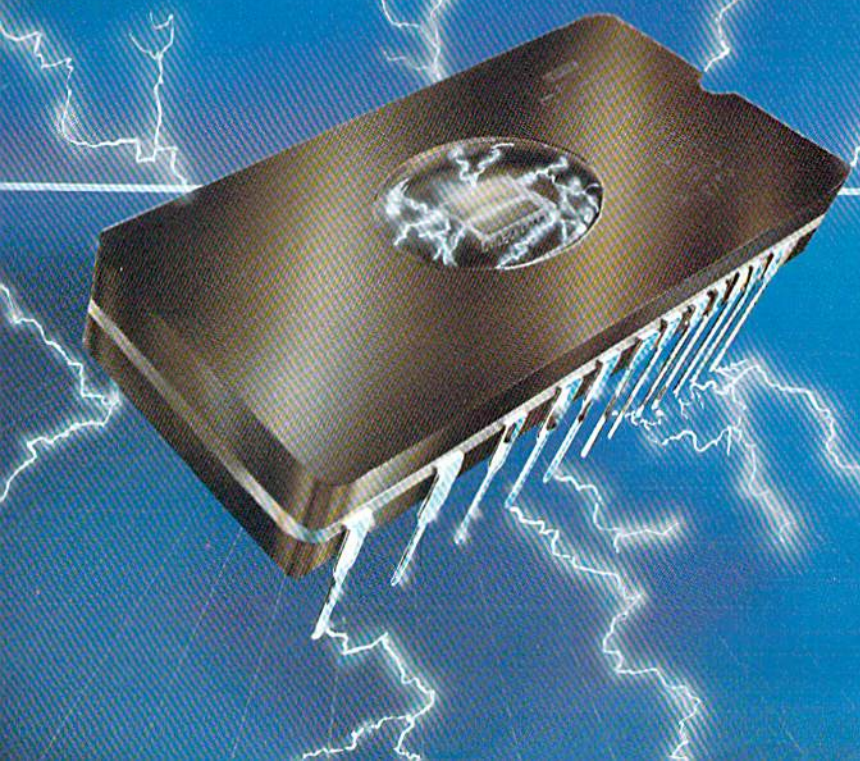
- **FAST** file copier - up to 6 times faster!
- **FAST** full protected - disk GCR nibble copier works in only 37 seconds!
- **FAST** full unprotected - disk copier.

•• **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 for KEYMASTER
$10.00 for update disks
KEYMASTER created by Jim Drew

New toll free number:
1-800-541-1541



MAGNUM LOAD BLOWS THE OTHERS AWAY!

ATTENTION 1541 AND MSD OWNERS!

- MAGNUM LOAD will LOAD and VERIFY programs up to **6 TIMES FASTER** than before. It is a new replacement KERNAL (operating system) ROM chip for your Commodore 64 or 128 computer.
- A high-speed loader, high speed verify, disk drive no-head-rattle routine (1541 drive) and a BASIC UNNEW ROUTINE (MSD drive) have replaced the Datasette tape routines.
- The first program on a disk may be loaded and run by pressing only two keys (SHIFT/RUN).
- Unlike the older, cartridge-style fast loaders, no ports are tied up at the rear of your computer, the screen is not blanked during loading and there is no wear and tear on the game port.
- For maximum convenience and performance, MAGNUM LOAD 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."

The chart below compares ACTUAL MEASURED loading times.

PROGRAM	STAR DOS	REGULAR LOAD	MACH 5	FAST LOAD	MAGNUM LOAD
Pitstop II (EPYX)	?	144 sec	43 sec	41 sec	31 sec
Music Shop (BRODERBUND)	?	105 sec	105 sec*	109 sec*	21 sec
Hitchhiker's Guide to the Galaxy (INFOCOM)	?	70 sec	70 sec*	**	68 sec*
On-field Football (GAMESTAR)	?	159 sec	66 sec	63 sec	56 sec
EASY FINANCE I (COMMODORE)	?	58 sec	13 sec	13 sec	11 sec

* = Will not fast load — defaulted back to regular load
** = *Failed to load at all*

FIVE VERSIONS OF MAGNUM LOAD ARE AVAILABLE TO FIT ANY NEED

VERSION	APPLICATION	PRICE
A	C64 computer and one 1541 drive	$24.95
B	C64 and one MSD drive (single or dual)	$24.95
C	C64, one 1541 drive AND one MSD drive (switchable)	$29.95
D	C128 computer and one 1541 drive***	$24.95
E	C128 and one MSD drive (single or dual)***	$24.95

*** = Fully compatible with 128 & CP/M modes. Cartridge versions MUST be UNPLUGGED to access 128 & CP/M modes!

ORDER THE VERSION YOU NEED NOW!

MAGNUM LOAD created by Jim Drew

C64, C128, 1541, 1571 and Datasette TM Commodore. MSD TM Micro Systems Development. MACH 5 TM ACCESS. FAST LOAD TM EPYX. STAR DOS TM Star Point.

Circle 19 on Reader Service card.

THE SHADOW $89.95

Shadow is a new and revolutionary piece of hardware that is used to duplicate even the most protected software. Fitting inside the disk drive (no soldering required), SHADOW takes complete control of all functions giving near 100% copies.

Being the best utility available today, it will even copy the other copy programs.

Because of the Shadow's unique abilities, we feel DOS protection is a thing of the past.



*HACKER PACKAGE $39.95

Shadow a disk while it loads, then read an exact list of:

- Track, sector, ID, check sum, drive status
- High and low track limits
- Density use on each track
- Half tracks that are used
- Command recorder shows commands that were sent to 1541 while program was loading
- RAM recorder records custom DOS

Shadow-scan any disk, then read exact list of:

- Valid tracks, half tracks, partial tracks and segments
- Sync mark link, header block links and data block links
- Track to track synchronization

Exclusive snap shot recorder will give you an exact copy of the 1541 RAM and can be viewed, saved or printed. Plus many more features included.

*Requires Shadow

*GT PACKAGE $44.95

Highly sophisticated and integrated piece of hardware that turns you 1541 into something you've always wanted.

- Track and sector display
- Drive reset switch
- Device number change
- Half track indicator
- Abnormal bit density indicator
- Shadow on-off indicator

The Shadow display will give you an accurate display of precisely what track you are accessing during a normal load even if the program does a read past track 35.

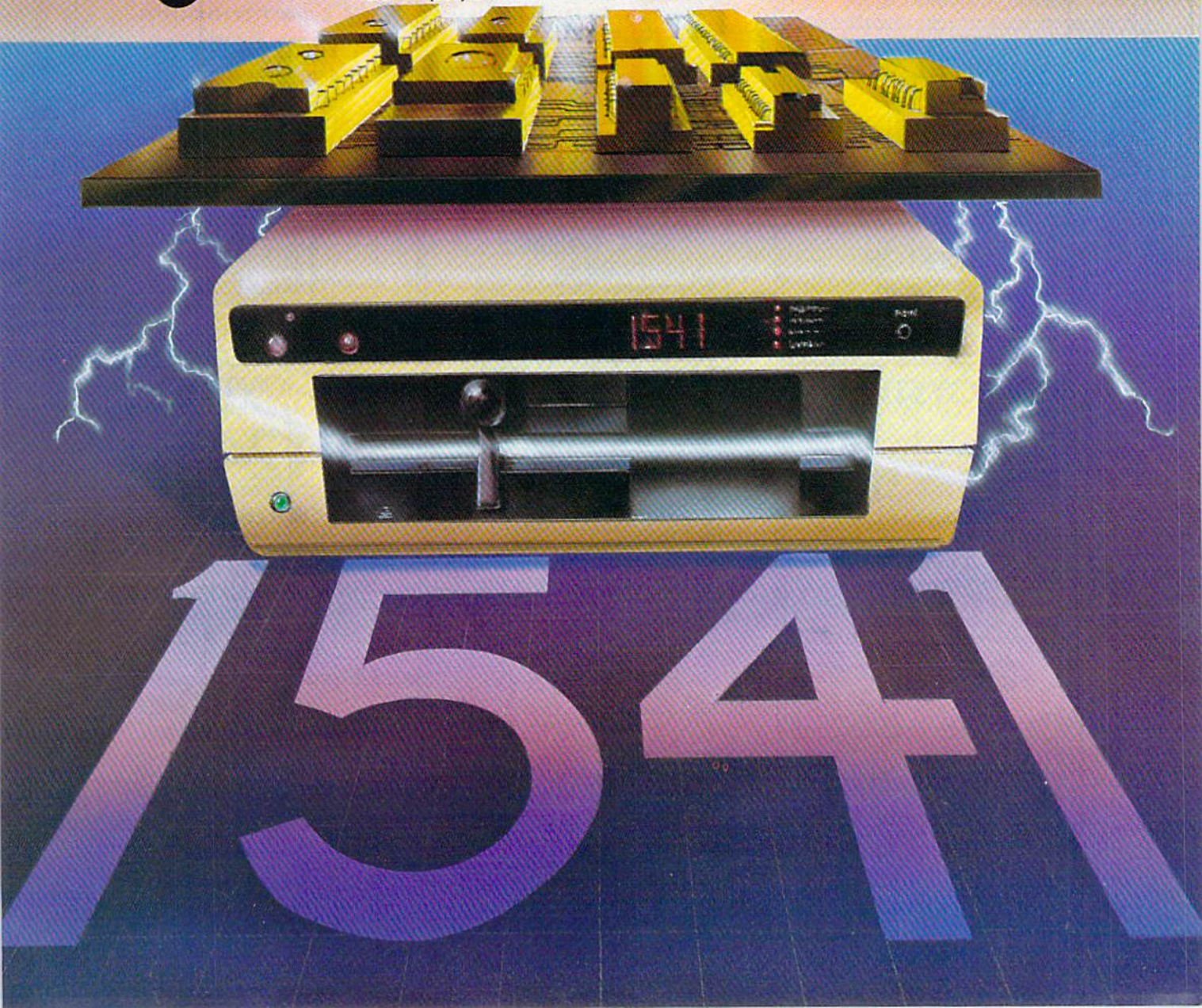
*Requires Shadow



Order by phone 24 hrs./7 days or send cashier's check/money order payable to Megasoft. Visa, MasterCard include card number and expiration date. Add $3.50 shipping/handling for continental U.S., $5.50 for UPS air. CODs add $7.50, Canada add $10.00. Other foreign orders add $15.00 and remit certified U.S. funds only. Distributors invited and supported.

MegaSoft LTD

P.O. Box 1080 • Battle Ground, Washington 98604
1-800-541-1541
Canadian/Foreign Orders Call
(206) 687-5205



COMPUTER CENTERS OF AMERICA

Means Low Distributor Selection of Computer

commodore



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



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

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
1902 MONITOR
CALL FOR PRICE



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

commodore
1670 MODEM
• 1200 Baud
$154.95



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

WICO JOYSTICKS
The Boss $12.88
3-Way $19.88
AND MORE!

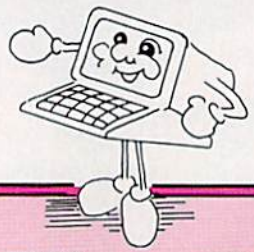
JOYSTICKS
GIM Professional Joystick
•2 Fire Buttons •Contoured Handle
•Lifetime Guarantee •Comparable to 3-Way
$9.95





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

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

Prices On A Vast Accessories



SP-1000

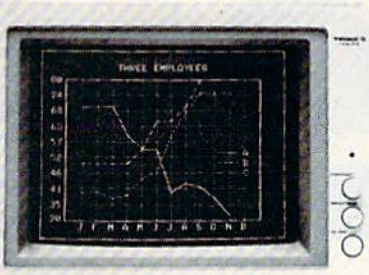
- Built-in Commodore Interface
- 2-Year Warranty
- Near Letter Quality Mode



$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



DISKETTES



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

*After $3 Rebate

Paperback Writer 128



Professional Word Processor for the Commodore 128
$24.95

MEMOREX SPECIAL
WORK STATION



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

EPYX
BUSINESS SOFTWARE FOR 128 COMMODORE COMPUTER

39.95 MICROSOFT MULTI PLANNER
29.95 PROGRAMMER'S BASIC TOOL KIT

CALL FOR PRICES

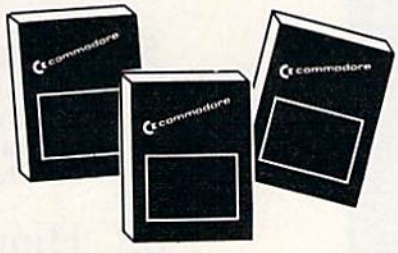
EPYX YOUR CHOICE



$19.95

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

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

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

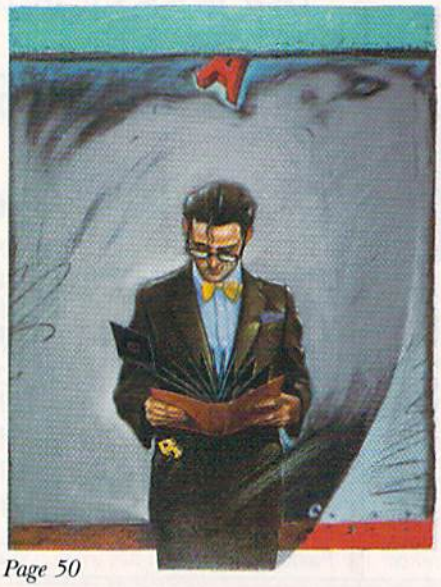
COMPUTER
COMPUTER CENTERS OF AMERICA
81 TERMINAL DRIVE,
PLAINVIEW, NY 11803

May 1986 RUN Vol. 3, No. 5

FEATURES

26 In Search of the Perfect Printer
Discover what's available in printers and how to choose the one that best fits your computing needs.
By Tim Walsh

32 Your Guide to Printer Interfaces
This handy chart shows you at a glance the printer features that various interfaces will support.
By Morton Kevelson



Page 50

34 C-128 Ultra Hi-Res Graphics, Part 2
Increase the flexibility of your existing C-128 Ultra Hi-Res program with this set of powerful and swift graphics commands.
By David Darus, Ken French and Louis Wallace

40 Swish!
Outshoot your opponent on home court with this popular one-on-one basketball game, Horse.
By Mark Jordan

50 Disk Reader
Now you can read any file on your disk and print out that information.
By Paolo Agostini

56 Label Maker
Combine expanded print, line centering, automatic numbering and graphics symbols to create professional-looking labels.
By Mike Konshak

62 Hide and Seek with Basic
Here's a short and easy method of hiding your Basic programs and disabling the stop key.
By Kenneth Flee

69 Easy Data Entry
Here's a way to take the tedium out of entering Data statements.
By Jim Allen

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.

DEPARTMENTS

6 **RUNning Ruminations**
What's new from Commodore?

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

14 **Software Gallery**
Personal Portfolio Manager
Hardball!
Stickybear Math and Stickybear Reading
Heart of Africa
Paperback Writer 128
The File Converter

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

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

84 **The Resource Center**
Find out how educators are employing computers in fine arts departments.

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

102 **Checksums for 1985 Programs**
We cover June programs this month.

106 **Mail RUN**

108 **New Products RUNdown**

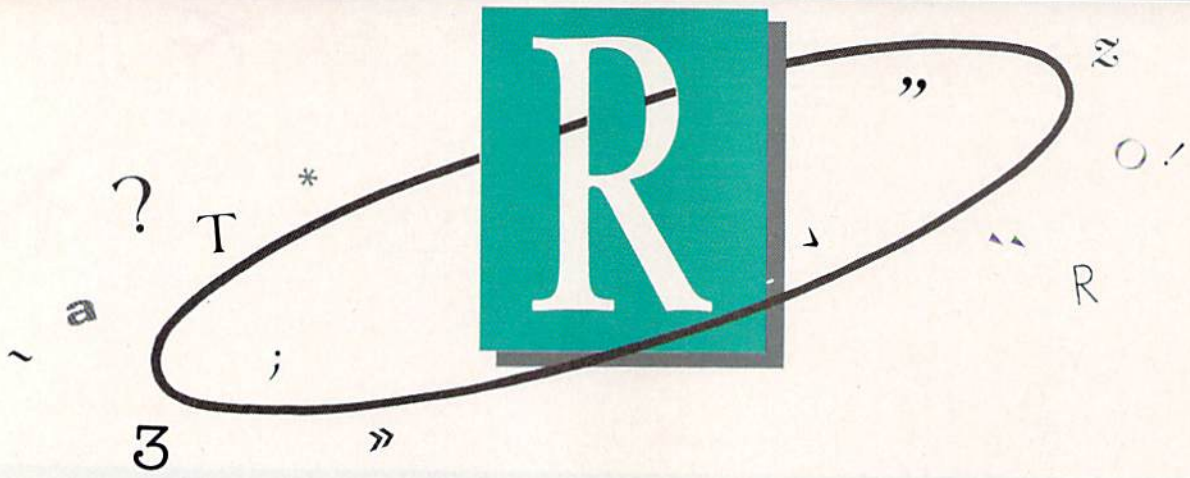
110 **How To Type In Listings**

111 **RUN Amok**
We correct our errors.

112 **Coming Attractions**

Cover photograph by Edward Judice

RUNNING RUMINATIONS



What's New from Commodore?

Commodore's recent release of several new products brought smiles of pleasure and anticipation to the faces of many software developers, dealers and users.

At the risk of upstaging *RUN*'s review and new product departments, I'd like to highlight several of these:

—Memory expansion cartridges. Are you familiar with the bouncing ball screen that has become a trademark of Amiga graphics? Well, now you can generate this, and other images, on the C-128! And the display is impressive.

Commodore's 1700 and 1750 plug-in expansion modules for the C-128 open up the possibility of using longer and more sophisticated programs and accessing them quickly.

The 1700 increases RAM by 128K, for a total of 256K on the 128. It will sell for about $175, depending on where you purchase it. The 1750 module contains 512K and sells for around $300.

It has been reported that these expansion modules do not work on some of the very first C-128 models issued by Commodore. If you own one of these early models, perhaps you'll want to put on your super sleuth cap and devise some sort of fix to solve the problem.

—Commodore mouse. We were also pleased to receive recently the long-awaited 1350 mouse. It is billed as a product for the C-128, but, depending on the software, it should work just as well with the C-64. This two-button mouse plugs into the joystick port and costs around $50.

Of course, what good is hardware without the software? It's now up to Commodore and software developers to create software that will take advantage of these products.

—GEOS. We have also recently received an advance copy of the GEOS operating system from Berkeley Softworks. In next month's issue, we'll be highlighting this product for the C-64. We'll put Commodore's new mouse through its paces to see how compatible it is with GEOS and how it controls the icons, pull-down menus and windowing features of GEOS.

—The Spartan. The on-again, off-again marketing campaign featuring the Spartan, the Apple II emulator for the C-64, is on again. In fact, I witnessed a demonstration of this product at the West Coast Commodore Show in San Francisco in early February.

The latest word from the manufacturer, Mimic Systems, is that the company is ready to ship units to distributors. The bugs have been exterminated and improvements have been added, thus opening the world of Apple II software to C-64 users. It appears that this time around, the dream may become a reality. We're anxious to receive a unit for review.

64 and 128 Coverage

We consider the introduction of the C-128 one of the major computer happenings in recent years. Commodore took the most popular home computer (C-64) and made it even better by the addition of an enhanced Basic, an improved keyboard, more memory, improved disk speed, 80-column display capability, C-64 compatibility and the capability of also running CP/M or C-128 software.

As expected, this computer has been well-received in the marketplace and by *RUN* readers. In a recent survey of readers, 78% of those who will purchase a new computer will choose the C-128.

Given, then, the excitement created by the introduction of the C-128, it is tempting to devote more coverage to this new computer.

We realize, however, that most of our current readers are C-64 owners, so the majority of our editorial content is, and will continue to be, C-64-related. In light of the compatibility of the 64 and 128, it is logical that they be covered in the same magazine.

Since the introduction of the C-128, *RUN* has devoted a little over a quarter of its editorial space to the C-128. We feel that this is in keeping with the readership of the magazine.

We want to attract new C-128 owners, but not at the expense of our current C-64 base. Commodore 64 owners can look toward *RUN* for continued support of their machine. At the same time, C-128 owners will find features and applications for their new machine.

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.

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 EDITORS
Louis F. Sander, Jim Strasma

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
1060 Marsh Road
Menlo Park, CA 94025

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 137 on Reader Service card.

GUARANTEED SOFTWARE

NEW NEW

VIZASTAR for the C128

Vizastar, the integrated spreadsheet, database and graphics program that has the Commodore 64 world raving, is now available for the C128. It boasts 80 columns, and has over 40K of free memory in the spreadsheet. Those who already own Vizastar 64 will be pleased to know that your existing files can be read by Vizastar 128. Also, you can upgrade to the 128 version. Call us for details and pricing.

"The only other comparable product would be Lotus 1-2-3 for the IBM PC; nothing in the C64 world comes even close to the features of Vizastar."
AHOY July 85

"I found Vizastar would do anything Lotus 1-2-3 could, and then some. It's my Commodore choice to become the standard against which the others will be judged."
INFO 64 Magazine, Issue #7

"Vizastar is an exceptional package that rivals the features of programs such as Lotus 1-2-3 and offers C64 owners the kind of integrated software previously only available for higher-priced systems."
RUN Magazine, June 1985

"I scrutinized, tested and experimented with Vizastar extensively, but could find no weaknesses whatsoever. It is the most comprehensive, most flexible, most powerful and easiest to use integrated software package I've worked with."
Commodore Microcomputer, Sept/Oct 1985

"I use an IBM PC at work with Lotus 123. I feel Vizastar is just as good and in someways better than 1-2-3."
Steven Roberson, NC. End User

"I have used Multiplan and Superbase; both are good pieces of software, but are inadequate when compared to Vizastar."
Jim Mathews, WA. End User

"So good, I bought a second C64 and Vizastar for my office. A wild bargain! You've saved me from having to buy IBM and Lotus."
Philip Ressler, MA. End User



VIZAWRITE CLASSIC for C128

This is the new word processor from Vizastar's author, Kelvin Lacy and is the successor to Omniwriter, which he also wrote. All the features of Omniwriter are there, plus many significant enhancements, like auto pagination, on-line help, pull-down menus, full-function calculator and more. Up to 8 'newspaper-style' variable-width columns can help with newsletters.

Three different proportionally-spaced "near letter quality" fonts are also built-in for use with Commodore or Epson compatible printers. You can merge almost any other word processor file directly into Vizawrite, including Paper Clip and Omniwriter. Naturally, it is also compatible with Vizastar. At all times, what you see on the screen is exactly the way it will be printed out. Vizawrite can do mail-merges and has an integrated 30,000 word spelling checker that you can expand yourself.

PROGRAM SPECIFICATIONS

Both Vizawrite and Vizastar are written in 100% machine language and run in the 128's FAST mode, making it lightning fast. They require a C128 with 80 column color or monochrome monitor. Both come with a cartridge, a diskette, and a reference manual. Vizastar also includes a 50 page tutorial book. Both work with 1541 or 1571 disk drives.

RISK-FREE OFFER

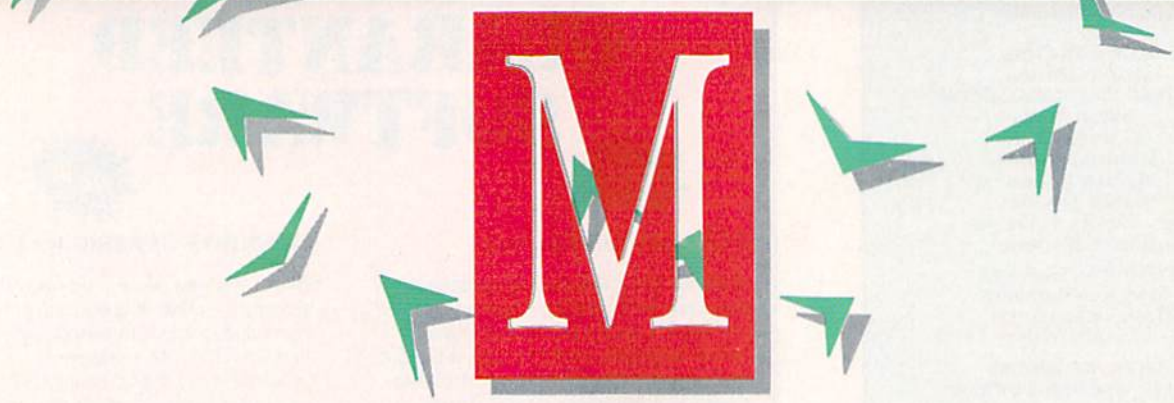
Vizastar 128 is priced at **$119.97**. Vizawrite's price is **$89.97**. Vizastar 64 XL8 is now available for **$119.97**. We are so positive you will be satisfied with our programs that we offer a 15-day money-back guarantee. Try it Risk-Free. Call us today or send a check or money order. VISA/MC accepted.

Calif. residents add 6.5% Sales Tax.
Add P&H: UPS-$4; COD/Canada-$7.

SOLID STATE SOFTWARE
1125 E. Hillsdale Blvd., Suite 104
Foster City, CA 94404-1609
(415) 341-5606
• Dealer Inquiries Welcome •

Trademarks: Lotus 1-2-3/Lotus Development
Commodore 64/Commodore Electronics Ltd. Multiplan/Microsoft

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.

May's master magicians, microprocessing mightily, make manifest manifold miracles: metronomes, machine code, mnemonics, miniature memory maps, monitors, modems, monographs. (Meatily, matchlessly magnificent, May's miraculous magicians!)

Message: Many men make magic.

Media magic maximizes minds. Media magic makes money. Mercenary? Minimally. Meritorious? Massively.

Moral: Magic manuscripts—mail 'em!

$2DE Disk rescue tab—Has one of your disks ever warped after a lengthy period of use, making it difficult to remove from your drive? If it's a copy-protected master disk, the situation is very uncomfortable.

To remove a warped disk more easily, put the disk into your drive, making a mark where its top edge extends through the front of the cabinet. Remove the disk, locate the mark and place a label or piece of tape there, folded to form a protruding tab. You can then use the tab to extract the disk when it gets stuck. Such a tab also makes your disk more visible in its box, so it's easy to find when you need it.

Mike Rogalski
Pasadena, CA

$2DF C-128 disk operations—Some of Basic 7.0's disk commands give trouble when you try to use them with string variables in their arguments. If you put your string variables inside parentheses, your troubles should vanish like magic. Another good solution is to operate on the variables before using them. Any of these should work:

```
DOPEN#1,"FILENAME"
DOPEN#1,(F$)
DOPEN#1,"" + F$
```

Jerry W. Jarvis
Spokane, WA

$2E0 C-128 mode switcher—When I replaced my trusty C-64 with a new C-128, it was difficult to keep track of which of my many disks were for C-64 mode and which were for Basic 7.0. I solved the problem by using the 1571's auto-boot feature to load and run this program for my C-64 disks.

```
100 REM SWITCH TO C-64 MODE
110 SYS 65357
```

C. David Moran
Ridgefield, NJ

$2E1 Testing for 128/64 mode—The following line tells a program whether it is running in C-64 mode or C-128 mode. It works because FRE(0) and FRE(1) on the 64 always return the same value; while in 128 mode, they return the amount of bytes free for program and variable storage, respectively. It's possible, but highly unlikely, for both to be equal in 128 mode. After the line is executed, variable M will contain a 128 or a 64, depending on the machine you're using.

```
100 M = 128 : IF FRE(0) = FRE(1) THEN M = 64
```

Edward Horgan
Coatesville, PA

$2E2 C-128 RGBI connector—Be careful when making cables for this connector, because the pin diagram in the manual is incompletely labeled. Pin 1 is always at the end of the longer row, but it can be on your left or your right, depending on whether you're looking at the pin end or the solder-terminal end of the connector, and on whether your connector is female or male.

Circle 2 on Reader Service card.

POWERFUL C128 SOFTWARE

– BUT DON'T TAKE OUR WORD, SEE WHAT THE EXPERTS SAY!

WORD WRITER 128 with Spell Checker*

An 80-column professional word processing system for home and business use. Includes an 85,000 word spelling checker, built-in 5 function calculator, and on-screen highlighting.

"... Using WORD WRITER 128 is an absolute joy ... We found nothing but the highest quality."
Run Magazine

SWIFTCALC 128 with Sideways*

A powerful, easy-to-use electronic spreadsheet designed especially for home and small business use.

"... Everything you could possibly need is present in SWIFTCALC 128."
Run Magazine

"... SWIFTCALC 128 has most of the features of Lotus 1-2-3."+
Ahoy Magazine
+ And at less than half the price!

DATA MANAGER 128 with Report Writer*

A complete general information storage and retrieval system with report writing, graphics, statistics, and label making capabilities.

"... A powerful and flexible database management system that takes full advantage of the C128's potential."
Run Magazine



SYLVIA PORTER'S PERSONAL FINANCIAL PLANNER*

All the computer tools you'll ever need to help manage your money on a day-to-day basis *and plan your financial future, too.*

"... By far the most thorough and readable manual, one that will take you keystroke by keystroke through the construction of budgets and analysis of finance ... The screen layout was the best of the programs we looked at ... For beginners especially, it's a real standout."
New York Post

SIDEWAYS

The ingeniously simple software program that rotates your spreadsheet by 90 degrees as it prints out and causes your hard copy to print out – you guessed it – *sideways.*

"... One small program that solves a big problem for computer users."
New York Times

Our customer technical support gets great reviews, too!

"... The good news starts as soon as you open the package. A toll-free customer hotline number is printed on the inside front cover of the documentation for each program. The support person I spoke with knew the systems and specializes in them exclusively."
Ahoy Magazine

Back-up program disks can be purchased from Timeworks at a nominal charge. And, with every Timeworks program you're protected by our liberal UPGRADE AND EXCHANGE POLICY. Details are inside every Timeworks package.

Timeworks Money Back Guarantee**

If you can find anything that works better for you, simply send us your Timeworks program, your paid receipt, and the name of the program you want, along with your check or credit card number for any retail price difference. If it's available, we'll buy it for you.***

IF YOU CAN FIND A BETTER PROGRAM WE'LL BUY IT FOR YOU**

* WORD WRITER 128, SWIFTCALC 128, and DATA MANAGER 128 interface with each other. YOUR PERSONAL FINANCIAL PLANNER interfaces with WORD WRITER 128.

TIMEWORKS®

More power for your dollar

Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015 (312) 948-9200

***Offer valid 90 days from date of purchase

© 1985 Timeworks, Inc. All rights reserved.

Before connecting any wires, you should carefully determine the location of pin 1, then mark it unmistakably. The other pins will then be easy to find, and your chance of error will be greatly reduced.

Most connectors have tiny pin numbers molded into the plastic, and checking them is the surest way to locate pin 1. You can also rely on this advice: If you are looking at the solder-terminal end of the connector, with the longer row of pins on top, pin 1 is on your right for a male connector and on your left for a female connector.

Ron Hall
Duncan, OK

$2E3 Using C-128 windowing—If you set a two-inch window at the top of your C-128 or Plus/4 screen, you can improve your speed when typing in programs. Set the window, then rest your magazine on the front of the monitor, with its top edge just below the window's lowest line. Since your cursor will never go below the window, you can simultaneously see the magazine and your own typed material.

Brad J. Taylor
Clarksville, TX

$2E4 C-128 Input prompt—To suppress the question mark, use POKE 21,64. Immediately following the Input statement, use POKE 21,0 to return the system to normal. If you don't make the second Poke, your system will operate erratically.

Edward B. Sullivan
Branson, MO

$2E5 Viva VIC-20!—If you have an old VIC-20 and a new C-128, you can use them both at once. The VIC sits nicely on the 128's back shelf, and its video cable plugs into the front of the 1702. Keep everything plugged in, using the 1702's back panel switch to select the display you'd like to see. To ensure good air flow through both computers, you can raise the VIC slightly on some sort of improvised feet.

Stanley Smith
Gladwin, MI

**$2E6 Magic C-64 clock**—This program is longer than our customary one-screen limit, but we think you'll be glad we printed it. It uses the seldom-used Time of Day clock to feed a continuous screen display. The TOD clock keeps much better time than TI$, and it isn't affected by other computer operations.

Running the program will start the clock, and nothing short of turning off your computer will stop it. Resets and stop/restore presses will kill the display without affecting the timekeeping. To return the display to life, execute a SYS40822.

```
10 PRINT"{SHFT CLR}{2 CRSR DNs}MAGIC CLOCK
   - FLOYD ANDERSON - SYS4822"
11 POKE55,118:POKE56,159:CLR
12 FORJ=0TO137:READK:L=L+K:NEXT:RESTORE:IF
   L<>11465THENPRINT"DATA ERROR":STOP
13 FORJ=0TO137:READK:POKE40822+J,K:NEXT
14 INPUT"{2 CRSR DNs}HR,MIN,SEC,AM/PM";H,M
   ,S,A$
15 IFH>12ORM>59ORS>59THEN140
16 IFH>9THENH=16+(H-10)
17 IFM>9THENM=16*VAL(LEFT$(STR$(M),2))+VAL
   (RIGHT$(STR$(M),1))
18 IFS>9THENS=16*VAL(LEFT$(STR$(S),2))+VAL
   (RIGHT$(STR$(S),1))
19 IFLEFT$(A$,1)="P"THENH=H+128
20 POKE56331,H:POKE5633,M:POKE56329,S:POK
   E56328,0:SYS40822:END
21 DATA 120,169,131,141,020,003,169
22 DATA 159,141,021,003,088,096,169
23 DATA 058,141,029,004,141,032,004
24 DATA 141,035,004,169,013,141,039
25 DATA 004,173,011,220,041,128,240
26 DATA 007,169,016,141,038,004,208
27 DATA 005,169,001,141,038,004,173
28 DATA 011,220,041,016,024,074,074
29 DATA 074,074,105,048,141,027,004
30 DATA 173,011,220,041,015,024,105
31 DATA 048,141,028,004,173,010,220
32 DATA 041,240,024,074,074,074,074
33 DATA 105,048,141,030,004,173,010
34 DATA 220,041,015,024,105,048,141
35 DATA 031,004,173,009,220,041,240
36 DATA 024,074,074,074,074,105,048
37 DATA 141,033,004,173,009,220,041
38 DATA 015,024,105,048,141,034,004
39 DATA 173,008,220,024,105,048,141
40 DATA 036,004,076,049,234
```

Floyd L. Anderson, Jr.
Niantic, IL

$2E7 Modem hearing aid—Sometimes you make a modem call and fail to get a carrier. Since most modems don't let you listen in on the line, you can't tell if you're getting a busy signal, a ring with no answer or something else. Worse, modems with the auto-redial feature can be repeatedly answered by an angry human voice.

To hear what your modem is receiving, use a telephone pickup such as the Radio Shack #44-533, which you can plug into any handy amplifier. Move the pickup around on the telephone or modem until you get a useful signal.

Many portable tape recorders can act as amplifiers for this purpose, if you plug earphones into the earphone jack, put a blank tape in the recorder and press the play and record buttons. The pause button will often stop the tape, but not the amplification.

Craig Edward Given
Chattanooga, TN

$2E8 Remembering power-up sequences—In our school, all children greet their Commodore by saying "My Dear Computer." This reminds them to turn on the monitor (My), then the disk drive (Dear) and, finally, the computer (Computer). When leaving the computer, they say "Computer, Don't Move." This, of course, reminds them to turn everything off in reverse order.

Continued on p. 90.

Circle 109 on Reader Service card.



SUPER HUEY

America's #1 Helicopter Flight Simulator

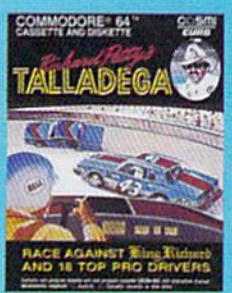
Forget the disappointment of other flight simulators . . . SUPER HUEY has eliminated them! – *Commodore Power Play Magazine*

"One of the best flight simulators ever tested!" – *Erv Bobo, Run Magazine*

Handles like a real helicopter. All your flying skill will be needed.

FOUR ACTION-PACKED ADVENTURES!

Solo Flight • Rescue
Explore • Combat



Race against King Richard Petty and 18 top drivers. A real life 3-D main event.
Atari® • Commodore® 64/128™



Your skill as an archer can protect you from the giant spiders, snakes, dragons, frogs, phantoms and, finally, the demogorgon.
Atari® • Commodore® 64/128™



Atari® • Apple® • Commodore® 64/128™

COSMI **where the action is!**

415 North Figueroa Street, Wilmington, CA 90744 • (213) 835-9687

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

LETTER QUALITY PRINTERS

when near letter quality isn't good enough

Cardco LQI $199
Epson DX-10 ..... $209
Epson DX-20 ..... $309
Star Powertype $299

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
Spellpro 64.....$32.95
Mailpro 64.....$24.95
Profile 64.....$36.95
PAL 64.....$32.95
POWER 64 .....$32.95
TOOLBOX 64 ..... $59.95

ENHANCER 2000

$159 DISK DRIVE
1 YEAR WARRANTY

LX-80 .....$214.95
LX-80 tractorfeed .....$ 34.95
Homewriter 10....$229.95
includes Commodore or Atari interface
FX-85 ....$314.95
FX-286 ... $CALL
DX-10 .... $CALL
DX-20 .... $CALL

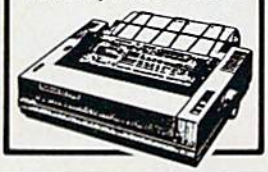
EPSON

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 ½ red,½ blue, ½ gold .. $8.95

PANASONIC

1091 ... $CALL
1080 ...$199.00
1092.....$299.00
1592.....$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 BLOWOUT

COMREX

COMREX 220
$79.95
Commodore Ready from EPSON
50 CPS, Tractor Feed, 80 Columns

tcp **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

BLUE CHIP

Baron	$24.95
Millionaire	$24.95
Tycoon	$24.95

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

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 other SPINNAKER Software	

STRATEGIC SIMULATIONS
CALL FOR OUR LOW PRICE ON ALL SSI GAMES

MISCELLANEOUS

C-64 WORD PROCESSORS

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

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

CARDCO

Write Now	$22.95
Calc Now	$19.95
Paint, File, Spell, Mail Now	$call
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

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 Brodetbund 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

SPREADSHEETS

EPYX. MULTIPLAN 128	$44.95
PERFECT CALC	$CALL
SWIFTCALC 128 W/SIDEWAYS	$49.95
VIZASTAR 128 (Integrated Spreadsheet, Database, Graphics)	$CALL

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

NEW TITLES EVERY DAY!
CALL FOR LATEST INFORMATION!

RGBI/COMPOSITE MONITORS

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

Thompson Monitor $274.95
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

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



INFODESIGNS SOFTWARE

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

tcp IS A COMMODORE AUTHORIZED SERVICE CENTER



REPAIR RATES FOR OUT OF WARRANTY SERVICE

C-64 Repair	$49.95
1541 Align	$29.95
1541 Repair	$69.95
C128, 1571, Others.	$CALL

Repair Rates Include UPS Ground "Return" Shipping

General Accounting System **CMS**

INCLUDES:
- GENERAL LEDGER
- ACCOUNTS RECEIVABLE. BILLING. STATEMENTS
- ACCOUNTS PAYABLE. CHECK WRITING
- PAYROLL

ALL MODULES INCLUDED FOR **$134.95**

Circle 209 on Reader Service card.

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

tcp



Compiled by SUSAN TANONA

Personal Portfolio Manager

A

This Program Will Help You Manage Your Investments

Personal Portfolio Manager allows you to keep track of both short- and long-term investments, maintain tax records and generate tailor-made reports on your portfolio. Even a certain amount of financial analysis is possible.

One of the unique features of this program is that it contains a built-in terminal program, optimized for connecting to such financial databases as Dow Jones News/Retrieval and Warner Computer Service.

The documentation is impressive. More than 80 pages explain the operation of the package in detail.

Entering the initial data is a relatively straightforward process, although it does take some time.

Once you've entered your data, you can create and print out reports based on that information. You can either customize the reports or use one of several standard forms included with the program. If you decide to create your own reports, you'll have to get involved with some mathematics, which the reference section helps you with.

As you probably know, financial information is available through many on-line computer networks. With most financial software, you must input the updated stock quotes yourself. The terminal program integrated into Personal Portfolio Manager makes this a snap, but you'll have to subscribe to either the Dow Jones News/Retrieval or the Warner Computer Service to use the automatic quote-gathering system.

You may use the quote-gathering software on an on-demand basis, or you can specify a particular time each day for the program to make the call for you (with an auto-dial modem, of course).

Since the financial services often include news reports, Personal Portfolio Manager's terminal program includes an 8000-character buffer for saving news items and reading them off-line. The program can even be used for checking into the local bulletin board.

You may use either one or two disk drives and the VIC Modem, 1650 or 1660 modem. The manual claims compatibility with any properly interfaced printer. I tested Personal Portfolio Manager with both a 1525 and MPS-801 printer, with good results.

Whether your investments include stocks, options, bonds, mutual funds or treasury bills, Personal Portfolio Manager will help you make the most of your money. *(Abacus Software, PO Box 7211, Grand Rapids, MI 49510. C-64/$39.95 disk.)*

Jim Grubbs
Springfield, IL

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!

Hardball!

A

This Superb Sports Simulation Delivers Major League Excitement

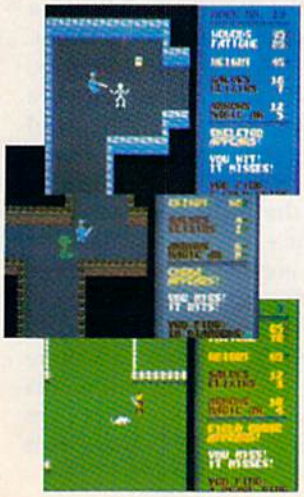
Simply stated, Accolade's Hardball is one of the best sports simulations ever created. Not only does the game feature graphics that look like NBC's Game of the Week, but its realistic action and extensive play options give it the depth necessary to sustain long-term interest.

You can play Hardball against a friend or against your C-64, with either side the home team. Virtually all functions are under joystick control.

There is a total of eight pitches, including fastballs, offspeeds, sliders, sinkers, screwballs and curves. However, each of the pitchers on your roster is expert in only four pitches. After selecting a pitch, you use the

TEMPLE OF APSHAI TRILOGY™
BIGGER. MEANER. AND RICHER THAN EVER.





You know Temple of Apshai.

The classic. Best-seller for over *four years.*

You may have friends trapped forever in its dark recesses.

Players have dropped from sight for weeks at a time, searching for the treasures of Apshai.

Well now we've raised the stakes.

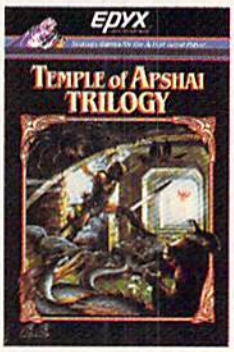
Introducing the *new* Apshai Trilogy. The *combined* wrath of the world famous Temple of Apshai®, Upper Reaches of Apshai®, and Curse of Ra®. All on a single disk. Twelve levels. 568 rooms to explore. More choices. More chances. Best of all, there's faster game play.

The graphics and sounds are new. The challenge of the dungeons is timeless.

Are you ready for the most involving role-playing game ever designed?

Temple of Apshai is waiting. Silently lurking. Patiently waiting. *For you.* At your nearest Epyx dealer.

	APPLE II	MAC	ATARI	IBM PC	C64/128
Temple of Apshai Trilogy	✓	✓	✓	✓	✓

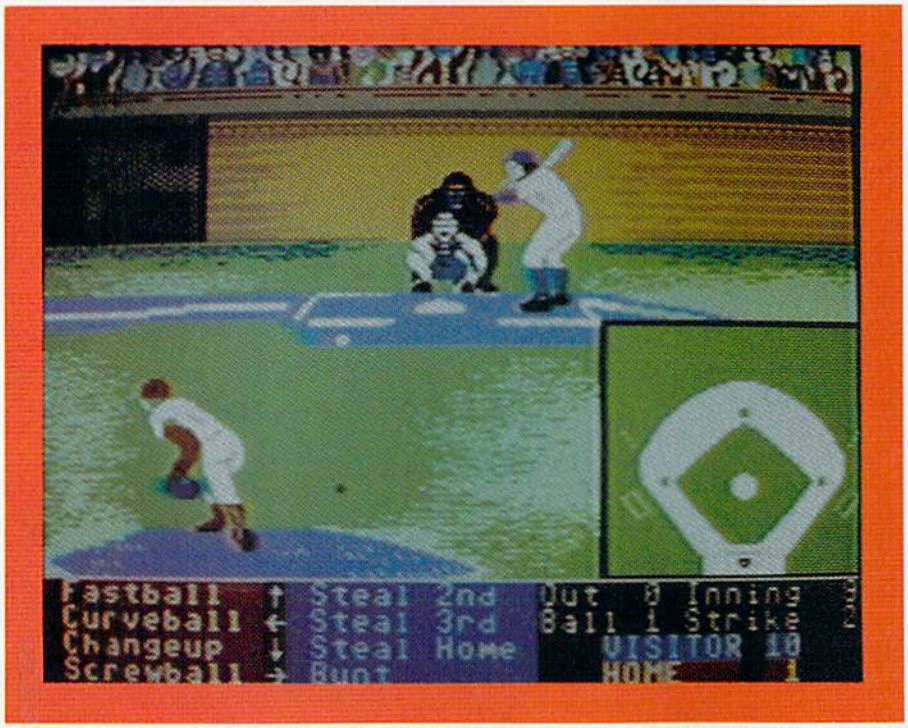


EPYX
COMPUTER SOFTWARE

1043 Kiel Court, Sunnyvale, CA 94089

Strategy Games for the Action-Game Player

Circle 12 on Reader Service card.



Hardball!, from Accolade.

joystick to determine where you'll direct the ball.

If the pitch is over the plate, the word *strike* appears from out of the umpire's mouth as he gestures the call. If the ball is hit, it's time to get the fielders in on the action.

As the ball leaves the hitter's bat, the camera angle shifts from the classic behind-the-pitcher view to a wide shot of the outfield. The fielder closest to the ball begins blinking and is suddenly under joystick control. When a fielder catches the ball, you press the fire-button and move the stick in the direction you want the ball thrown. Even double and triple plays can be made with ease.

Just as in real baseball, the most difficult part of being up at bat is waiting for your pitch. Whether or not you make solid contact with the ball will depend upon your timing and your judgment of the pitch.

If you hit the ball, your player automatically runs toward first base; however, from there it's up to you to decide whether or not to try for second base. In fact, the only fault I can find with Hardball is that if you do decide to head for the next base, there's no turning back.

There are several big league options available from the Manager's Decision screen, which you call up and exit by pressing the space bar. At bat, you may choose to send in a pinch-hitter through player substitution or by exchanging positions. The team in the field can use the Manager's Decision screen to send in a relief pitcher, shift the outfield left or right, set the infield at normal or double-play depth, or intentionally walk the batter.

To help you make informed managerial decisions, batters' averages are displayed as they step up to the plate and statistics on other players are available from the Decision screen. Some of the game's other realistic features include a conventional baseball scoreboard, extra innings, foul tips, home runs and starting pitchers whose accuracy fades in the late innings.

Hardball is a perfect blend of action and strategy with first-rate graphics, sound effects and music. It is required playing for sports fanatics as well as anyone interested in state-of-the-art entertainment software for the C-64. *(Accolade, 20863 Stevens Creek Blvd., Cupertino, CA 95014. C-64/$29.95 disk.)*

Bob Guerra
Charlestown, MA

Stickybear Math and Stickybear Reading

B

These Programs Help Your Child Practice Some Basic Skills

Stickybear Math and Stickybear Reading are top-notch drill programs for primary school children. The reading program is for children of ages five to eight, and the math for six to nine. Both programs are charming, well-designed and fun.

A lengthy disk-access time may make children impatient, but, while I'd prefer a faster response, this problem is a natural result of the excellent high-resolution graphics.

Stickybear Reading is a little more difficult to use than Stickybear Math, and children will need some parental help.

Stickybear Reading includes three modules: Matching Words and Pictures, Fill in the Blank and Modular Sentences. Even a child who barely knows how to read can learn new vocabulary, because the program won't let him make a mistake. When the child enters an incorrect answer, the computer makes an unpleasant sound. The child never has more than three choices, and when he inputs the correct response, he is rewarded with approving noises from the computer. This correct answer is displayed long enough for the child to fix it in his mind.

The Find the Words and Build a Sentence modules both offer delightful and effective animation. For example, you see a screen in which a cow jumps over Stickybear. The child makes a selection from the words *sheep*, *skunk* and *cow* to fill in the blank. While the child is learning the word *cow*, he's also learning the phrase *jumps over*.

The sentence game provides the child with subjects, verb and adverb combinations and objects. Any combination of these three elements works, although some sentences are unlikely. After the child completes

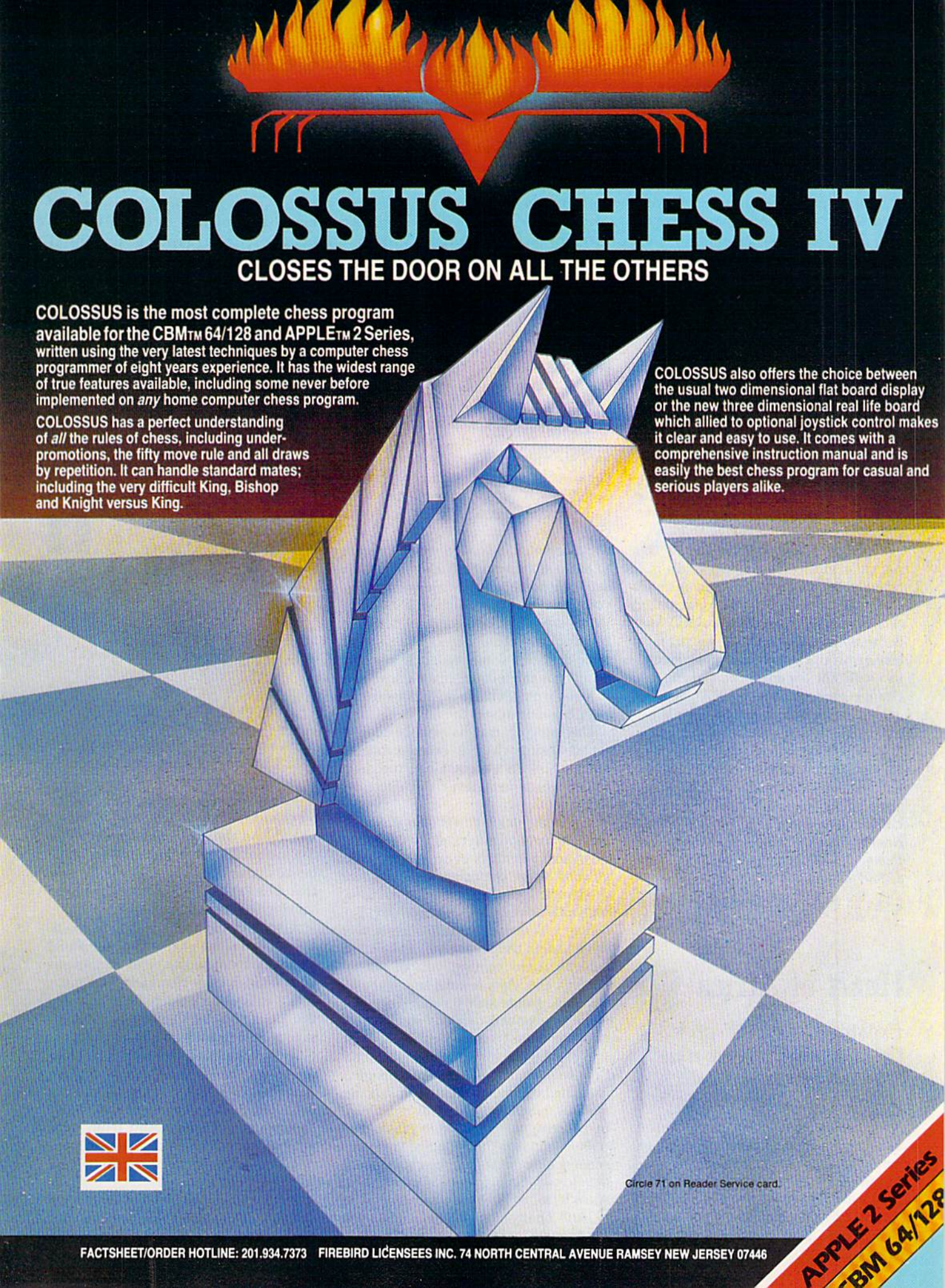
COLOSSUS CHESS IV

CLOSES THE DOOR ON ALL THE OTHERS

COLOSSUS is the most complete chess program available for the CBM™ 64/128 and APPLE™ 2 Series, written using the very latest techniques by a computer chess programmer of eight years experience. It has the widest range of true features available, including some never before implemented on *any* home computer chess program.

COLOSSUS has a perfect understanding of *all* the rules of chess, including under-promotions, the fifty move rule and all draws by repetition. It can handle standard mates; including the very difficult King, Bishop and Knight versus King.

COLOSSUS also offers the choice between the usual two dimensional flat board display or the new three dimensional real life board which allied to optional joystick control makes it clear and easy to use. It comes with a comprehensive instruction manual and is easily the best chess program for casual and serious players alike.



Circle 71 on Reader Service card.

FACTSHEET/ORDER HOTLINE: 201.934.7373 FIREBIRD LICENSEES INC. 74 NORTH CENTRAL AVENUE RAMSEY NEW JERSEY 07446

APPLE 2 Series

CBM 64/128

the sentence, the program moves to an animation screen that shows the sentence in action.

Stickybear Math features 20 levels of practice in addition and subtraction. Correct answers help to construct a bridge to save Stickybear, who appears after every few problems to let the child know how much of the bridge he's built.

Two features really distinguish this program. The first is that on the levels where the problems involve small numbers, the designers have built set theory into each screen. For example, in an addition problem, the screen might have five inchworms above the number five and four above the four. When the child types the correct answer, the inchworms crawl across the screen to make a group of nine above the answer.

The other exciting feature is the parent's ability to set program parameters. The disk can hold individual files on up to 24 children, recording the progress of each. Thus, if the child is bored with his present level, or if the problems have become too difficult for him, the parent can change these parameters.

Drill programs are not the most exciting educational software available, but they are valuable, especially for children who need extra time with basic skills. Stickybear Reading and Stickybear Math are excellent choices to meet this need. *(Weekly Reader Family Software, 245 Long Hill Road, Middletown, CT 06457. C-64/ $29.95 disk.)*

Annette Hinshaw
Tulsa, OK

Heart of Africa B

Explore Africa in Search Of Adventure, Riches and A Pharaoh's Lost Tomb

Because of your "uncommon worthiness," you have been selected by the attorneys of the late Hiram Perkins Primm to carry on his life's work of exploring Africa. You will be given Primm's notes on Africa, $250 and passage to Cairo aboard the African Queen. From the time of your arrival in January 1890, you'll have five years to find the legendary lost tomb of Pharaoh Ahnk Ahnk. If you succeed, you will inherit Primm's estate. If you fail, your successor will be instructed to give you a proper burial—should your earthly remains be located.

Your adventure begins in the port city of Cairo. Like the other port cities you'll visit on your expedition, such as Berbera, Zanzibar, Boma and Lagos, Cairo contains shops where you can buy the supplies you'll need in your travels. You'll also want several gifts to offer the tribesmen of various villages in exchange for directions to the chief's hut. Also available in each city is a travel agent who can provide passage from one port city to any other.

Since you can have only one object in hand at a time, you'll always want to use the item that's most appropriate to your surroundings, such as a canteen while crossing the desert. When not holding any other object, it's a good idea to keep some type of weapon handy for protection. Just be sure not to walk into a village with a pistol in your hand. It upsets the natives.

During your travels, you'll encounter charging rhinos, deadly insects and poisonous snakes. Unfortunately, these events are never depicted on the screen.

If you're lucky, you'll also discover such natural wonders as great waterfalls and perhaps even some large gold or silver deposits. As you make discoveries, the information is automatically chronicled in a diary for future reference. In addition, if you have a map, the areas you explore are colored in to remind you of where you've been. As a reward for your discoveries, funds will be wired to you when you return to a city so that you may continue your expedition.

By studying the notes left by Primm, you'll gain valuable insights into the language and customs of the various tribes you'll encounter. Then, by offering an acceptable gift to the tribal chiefs of the villages, you may receive clues that will help you locate precious metals, jewels or even Ahnk Ahnk's tomb. Without this help, there is little chance of success and you'll be destined to perish in the searing desert or become hopelessly lost in dense jungle.

Heart of Africa is an entertaining safari into the jungles, deserts and mountains of the mysterious continent of Africa. From geographical landmarks like Mount Kilimanjaro and Lake Chad, to tribes such as the Ugandi and the Zulu, Heart of Africa is a fascinating lesson in social studies. It's a living textbook where people, animals and natural wonders come alive, and your survival depends on how well you've studied. *(Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. C-64/$32.95 disk.)*

Bob Guerra
Charlestown, MA

Paperback Writer 128 B

A Powerful Word Processing Package For Your C-128

Although Paperback Writer was originally written for the C-64, it makes an easy transition to the C-128 and, in the process, becomes even more powerful.

The program utilizes the C-128's 80-column format, the fast (2MHz) speed and the autoboot feature. The documentation seems still to have been written for the C-64, with new features exclusive to the C-128 mode set aside in boxes.

After autobooting, the Paperback Writer presents you with a menu of printers from which you can input your brand. Unfortunately, you must make this choice each time you use the program, as there is no way to save it to the master disk.

In the Write/Edit mode, a command box above the text area gives you a list of major routines. Pressing the Commodore key flips you into a sub-menu of choices and from here all commands are alphabetic and one-key, making the functions easy to remember and use.

With a whopping 64K of free memory left after booting, you're not likely to run out of room for docu-

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.

ments or files. However, if you suspect you're getting close, pressing CTRL-M shows how much room you have left. If you are working on a very long manuscript, you can link files together.

Along with giving you a large working memory, Paperback Writer allows you to divide the memory into two files of 32K each. Both run concurrently and you may swap information from one file to the other.

Paperback Writer offers such printing options as italics, boldface, super- and subscripts, all of which you see on the screen exactly as they will appear on paper.

Formatting of text is done from an extensive menu of commands. It is here, as well as in flipping between various menus, that the speed of the C-128 comes into play, for the changes you make are almost instantaneous.

Paperback Writer also contains a spelling checker, but you must create your own dictionary. I'm not sure why, but this must be done in 40-column mode.

Paperback Writer 128 also offers such features as search and replace; block move and block delete; Numeric mode for automatic alignment of numbers; and a DOS wedge.

The only limitations I found are the inability to save either your printer information or your choice of screen colors. Saving these so that they become default parameters would make a good word processor even better.

Those drawbacks aside, my overall recommendation is high. If you're ready for 80-column word processing and you're looking for a piece of software that shows off the power of your new computer, then Paperback Writer 128 is worth your consideration. *(Digital Solutions, PO Box 345, Station A, Willowdale, Ontario, Canada, M2N 5S9. C-128/$49.95 disk.)*

Ervin Bobo
St. Peters, MO

The File Converter

Say Good-Bye to The Problem of File Incompatibility

B

No matter how much you treasure your word processing or database program, a new package eventually appears offering more features or faster operation. You'd like to use this new package, but hesitate because of the problem of file incompatibility between programs.

The File Converter provides a solution to this problem. It's a handy utility that allows you to automatically convert files, read relative files and speed up database entry.

Using a built-in template or one of your own design, The File Converter will read almost any word-processing file, strip away unnecessary characters, convert the format and write a

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.

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.

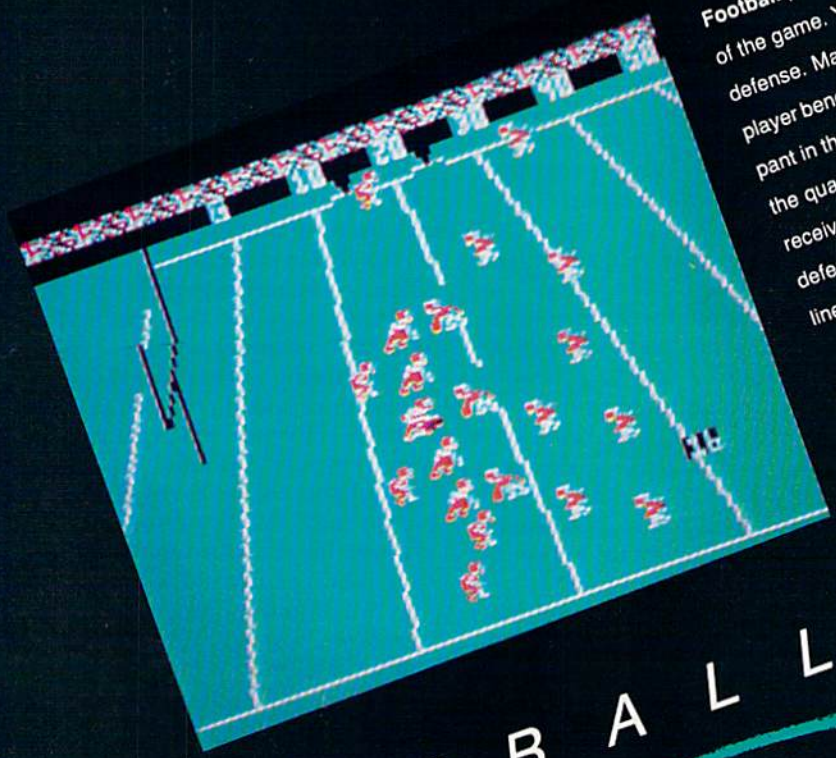
Write or call today for more information and a free brochure.

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.*



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.

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

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

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.

new sequential file that can be read by your word processor. The converted file can be viewed on the screen or sent to the same disk as the original or to any other disk drive.

Rewriting database files presents more of a problem; you must first understand how your program organizes its files and how the new records are written. Record lengths may be fixed or variable. Disk files may be program, sequential, relative or random. Delimiters to mark the beginning and end of fields will vary, as may the number of fields in the old and new versions of your file.

The process isn't as complicated as it may sound, and, fortunately, the documentation is comprehensive and easy to follow. If you're the least bit computer literate, you should be able to use this program successfully.

Once you've entered the proper conversion values into the program, you can save the newly created template to disk. You may be surprised to discover that The File Converter also allows you to create new fields, eliminate old ones, reorganize records and add non-printing characters to the beginning of each record.

Two other handy utilities included are a relative-file reader, which allows you to inspect and print out relative files, and a batch-entry program, which speeds keyboard entry of database records.

The Fast Entry program included with The File Converter offers an innovative solution to the problem of the slow speed of Commodore disk drives. After you've set up a format with fields corresponding to the records in your database, you can enter data while the disk drive works independently. Records are still saved after you've typed them, but you'll no longer have to alternate between keyboard and disk operations.

Fast Entry also gives you several clever options that help you along. If, for example, you must enter hundreds of names and addresses for a mailing list, Fast Entry will automatically number each record; enter designated fields; move to the next field without a carriage return; and repeat specified fields from record to record.

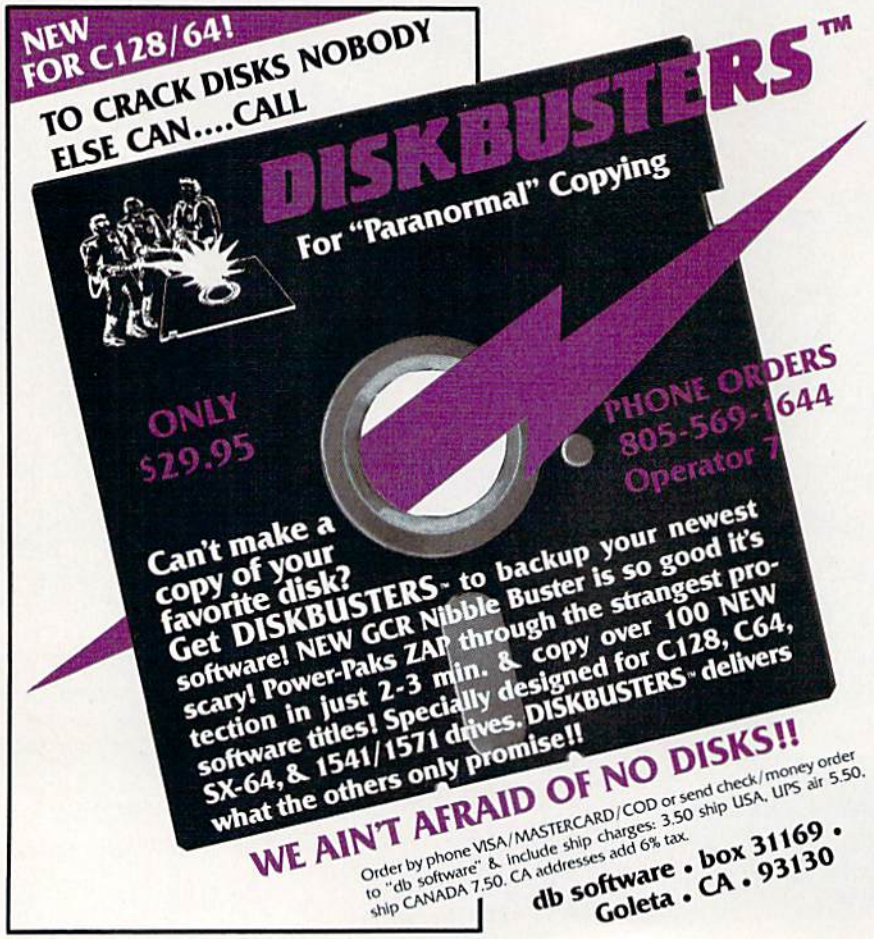
Data entered with Fast Entry can be written in either Flexfile or Superbase format. To use the data with some other database program, you must first run the output file through the converter program.

The opportunities that The File Converter extends to Commodore users are virtually endless. Along with providing compatibility among Commodore-specific software, you can also reformat ASCII data from other computer systems.

Of all the utility programs available for the C-64, The File Converter may not be the one you use most often; however, use it once and you'll never want to be without it. *(Applied Technologies, Lyndon Way, Kittery, ME 03904. C-64/$39.95 disk.)*

John Premack
Lexington, MA

Circle 157 on Reader Service card.



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 (Dimensions Required)	13.00

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

A Printer For All Reasons

Search For The Best High Quality Graphic Printer

If you have been looking very long, you have probably discovered that there are just too many claims and counter claims in the printer market today. There are printers that have some of the features you want, but do not have others. Some features you probably don't care about, others are vitally important to you. We understand. In fact, not long ago, we were in the same position. Deluged by claims and counter claims. Overburdened by rows and rows of specifications, we decided to separate all the facts — prove or disprove all the claims to our own satisfaction. So we bought printers. We bought samples of all the major brands and tested them.

Our Objective Was Simple

We wanted to find that printer which had all the features you could want and yet be sold directly to you at the lowest price. We didn't want a "close-out special" of an obsolete product that some manufacturer was dumping, so we limited our search to only those new printers that had the latest proven technology. We wanted to give our customers the **best** printer on the market today at a low price.

The Results Are In

Our search is over. We have reduced the field to a single printer that meets all our goals (and more). The printer is our SP-1000 manufactured by a Division of Seiko, the world class manufacturer of many fine products from Japan. We ran this printer through our battery of tests and it came out shining. This printer *can* do it all. Standard draft printing at a respectable 100 characters per second, and with a very readable 12 (horizontal) by 9 (vertical) character matrix. This is a full feature, bi-directional, logic seeking, true descender printer.

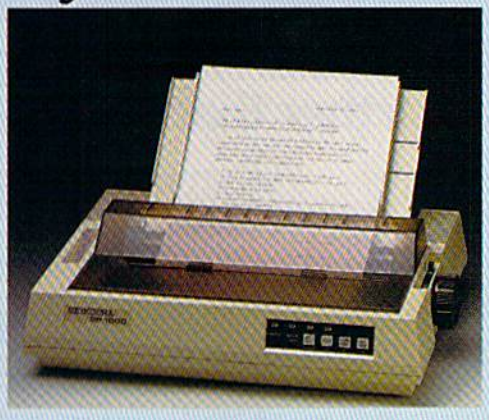
"NLQ" Mode

One of our highest concerns was about print quality and readability. This printer has a print mode termed Near Letter Quality printing (NLQ mode). This is where we outshine all the competition. Hands down! The character matrix in NLQ mode is a very dense 24 (horizontal) by 18 (vertical). This equates to 41,472 addressable dots per square inch. Now we're talking ***quality*** printing. It looks like it was done on a typewriter. You can even print graphics using the standard graphics symbols built into your computer. The results are the best we've ever seen. The only other printers currently available having resolution this high sell for hundreds more.

Features That Won't Quit

Your computer can now print 40, 48, 68, 80, 96, or 136 characters per line. You can print in ANY of scores of styles including double width and reversed (white on black) styles. You not only have the standard Pica, Elite, Condensed and Italics, but also true Superscripts and Subscripts. Never again will you have to worry about how to print H_2O or X^2. This fantastic machine will do it automatically, through easy commands right from your keyboard. Do you sometimes want to emphasize a word? It's easy, just use **bold** (double strike) or use *italics* to make the words stand out. Or, if you wish to be even more emphatic, underline the words. You can combine many of these modes and styles to make the variation almost endless. Do you want to express something that you can't do with words? Use graphics with your text — even on the same line. You have variable line spacing of 1 line per inch to infinity (no space at all) and 143 other software selectable settings in between. You can control line spacing on a dot-by-dot basis. If you've ever had a letter or other document that was just a few lines too long to fit a page, you can see how handy this feature is. Simply reduce the line spacing slightly and . . . VOILA! The letter now fits on one page.

Special only $219.95 For Commodore



Forms? Yes! Your Letterhead? Of Course!

Do you print forms? No problem. This unit will do them all. Any form up to 10 inches wide. The tractors are adjustable from 4 to 10 inches. Yes, you can also use single sheets. Plain typing paper, your letterhead, short memo forms, labels, anything you choose. Any size to 10" in width. In fact this unit is so advanced, it will load your paper automatically. Multiple copies? Absolutely! Use forms (up to 3 thick). Do you want to use spread sheets with many columns? Of course! Just go to condensed mode printing and print a full 136 columns wide. Forget expensive wide-carriage printers and changing to wide carriage paper. You can now do it all on a standard 8½" wide page, and you can do it quietly, it's only 55dB. This is much quieter than any other impact dot matrix printer that we know of and is quieter than the average office background noise level.

Consistent Print Quality

Most printers have a ribbon cartridge or a single spool ribbon which gives nice dark printing when new, but quickly starts to fade. To keep the printers output looking consistently dark, the ribbons must be changed quite often. We solve this problem by using a wide (½") ribbon cartridge that will print thousands of pages before needing replacement. (When you finally do wear out your ribbon, replacement cost is only $11.00. Order *#2001. (Also Locally Available.)*

The Best Part

When shopping for a printer with this quality and these features, you could expect to pay much more. *Not now!* We sell this fantastic printer for **only $219.95! 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. The warranty repair policy is to repair or replace and reship to the buyer within 72 hours of receipt.

The Bottom Line

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

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**, $26.00

Apple IIc & Macintosh Order **#2300**, $239.95 with cable.

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.

We also have interfaces and cables for many other computers not listed. Call Customer Service at 805/987-2454 for details.

Shipping and insurance is $10.00 — UPS within the continental USA. If you are in a hurry, UPS Blue (second day air), APO or FPO is $22.00. Canada, Alaska, Mexico are $30.00 (air). Other foreign is $70.00 (air). California residents add 6% tax. The above are cash prices — VISA and MC add 3% to total. We ship the next business day on money orders, cashiers' checks, and charge cards. A 14-day clearing period is required for checks.

For information call 805/987-2454

TO ORDER CALL TOLL FREE

1-(800) 962-5800 USA (8-8 PST)

1-(800) 962-3800 CALIF.

Dealer inquiries invited

or send order to:

APROTEK

1071-A Avenida Acaso

Camarillo, CA 93010

THE COMMODORE CONNECTION.

Introducing QuantumLink,™ the only official Commodore®-supported on-line service. It will expand your 64's universe further than you ever imagined.

Now you can take your computer beyond the limits of software programs. The new QuantumLink™ on-line service has been specially designed to turn your Commodore 64® or 128™ into a powerful "tele-computer." All you need is a disk drive and a modem to access hundreds of useful features.

Here are just a few of the services available.

EXCITING SOFTWARE

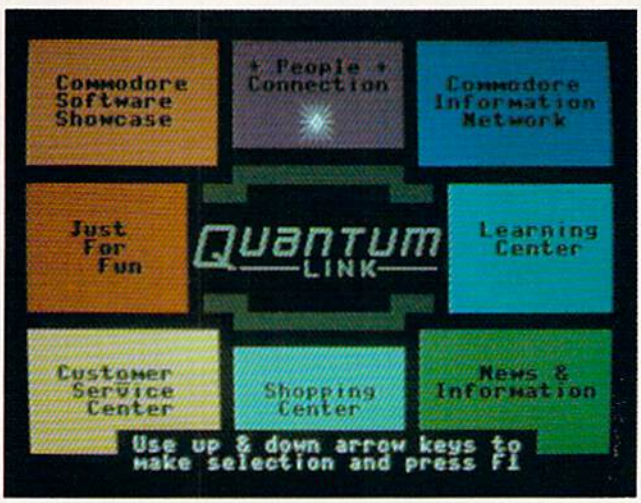
- Preview top new software before you buy it.
- Get hundreds of public domain programs.
- Read accurate, insightful software reviews.

HOT COMPUTER INFORMATION

- Exchange messages on bulletin boards.
- Get fast answers from Commodore computer experts.
- Read exclusive Commodore reports.
- "Ask Commodore" and get a quick reply.
- Participate in on-line seminars and discussions.
- Join Commodore's nationwide user group.

MAKE NEW FRIENDS

- Chat live with users across the country.
- Send and receive electronic mail.
- Find partners and play chess, hangman and other games *in full color.*



QuantumLink's full color, easy-to-use menu.

STAY INFORMED

- Access Grolier's Academic American Encyclopedia.™
- Read USA Today™ Evening Update.
- Get the scoop from RockNet™ news, Hollywood Hotline,™ Soap Opera Update.

FROM HERE TO INFINITY FOR ONLY $9.95 A MONTH.

New QuantumLink is the lowest priced full service network. For only $9.95 a month you can expand your Commodore's universe with a whole range of QuantumLink services. And, you can access many features including the encyclopedia, software catalog, USA Today, entertainment news and trivia quizzes as often as you like, for no extra charge. Special "Plus" services cost only 6¢ per minute. *But, your first hour of "Plus" time every month is free.* (No surcharges for communications or 1200 baud access, either!)

If you have a modem:



When you sign up for an additional month.

Now, getting on-line with QuantumLink is easier than you ever imagined. If you have a modem, we'll send you the QuantumLink telecommunications software and when you sign up for a month, we will give you the second month of service *free.*

If you don't have a modem:



When you sign up for 4 months service.

If you don't have a modem, we'll send you a Commodore 300 baud modem and the QuantumLink software *free* when you sign up for four months.

Commodore, Commodore 128 and Commodore 64 are trademarks of Commodore Electronics Limited. QuantumLink is a trademark of Quantum Computer Services, Inc. Academic American Encyclopedia is a trademark of Grolier Electronic Publishing, Inc. USA Today is a trademark of Gannett Co., Inc. Hollywood Hotline is a trademark of Hollywood Hotline.

QuantumLink™
The Commodore® Connection

Name_____

Address_____

City_____ State_____

Zip_____ Eve. Phone_____

☐ **I NEED A MODEM.** Please send my free Commodore® 300 baud modem, and the QuantumLink software. Charge my credit card $39.80, to cover the QuantumLink $9.95 monthly fee for the first four months.*

Credit Card: ☐ MasterCard ☐ Visa

Acct. No._____ Exp. Date_____

Signature_____

☐ **I HAVE A MODEM.** Please send me the free QuantumLink telecommunications software. I understand I will be charged the first month's fee of $9.95, and will get the second month free.*

2 WAYS TO ORDER:

BY PHONE:
If you have a modem, you can register on-line for fastest delivery! Hook up and call **1-800-833-9400!** If you need a modem, call **1-800-392-8200,** and ask for Terry. R-100

BY MAIL:
Mail card or this coupon to Quantum Computer Services, Inc., 8620 Westwood Center Drive, Vienna, Virginia 22180.

*If you use more than the included 1 hour of Plus services each month, you will be billed for the extra time. Offer valid in Continental U.S. for new subscribers only. Expires 6/30/86.

IN SEARCH OF THE

By TIM WALSH

This RUN *editor braved the wilds of printer-dom to give you a first-hand account of what's available and how to choose the printer that best fits your computing needs.*

If you need a computer, there's a good chance you also need a printer. The best printer for your computer system is not necessarily the most nor least expensive. It is the one that best satisfies your printing needs.

Therefore, it is of utmost importance that you know your needs before you buy. If you don't, you could end up with a printer that is not compatible with the software you intend to use with it. For instance, a letter-quality printer is fine for use with a word processor, but it can be practically useless with spreadsheets and other software that utilize graphics characters to create pictorial representations of data.

My primary objective in this article is to help you clearly determine what features to look for in a printer, based on your present and anticipated needs. My second objective is to introduce inexperienced *RUN* readers to a few currently available Commodore and non-Commodore printers, and to discuss their features. (Next month, we'll publish the second part of this article, in which I'll examine the Commodore MPS 1000, along with other printers that can be used with Commodores.)

I have set up some guidelines to help you streamline the selection process when choosing a printer.

Printer-Selection Guidelines

First, after determining your fundamental printer needs, sit down with pencil and paper and list them. Jot down some simple questions, such as the following, and try to answer them.

Are you going to be using your printer mainly with programs of your own design? If so, the least expensive, second- or third-hand dot-matrix printer you can find will probably be adequate.

Are you going to do a lot of professional or business correspondence with a word processor? If so, you'd be wise to invest in a good letter-quality daisywheel printer, to provide you with professional-looking correspondence.

Will you be working a lot with spreadsheets and databases? Business software dictates an investment in a high-quality dot-matrix printer that is fully compatible with both the software and the Commodore computer system you're using. Each of your software's features that cannot be accessed by the printer reduces your software's overall usefulness.

Once you've determined your printing needs, you're ready to start shopping. Then arises a most pressing question for all first-time buyers: Should you buy your printer at a mass-merchandise outlet, a computer store, or a mail-order house?

I advise beginners to go to a computer store that sells Commodore equipment and ask a lot of questions. Ask for demonstrations of printers in conjunction with a variety of software products; and get prices. If the printer of your dreams is sold and serviced by the dealer, you'll probably be best off buying your printer there—unless, of course, you can get the same model at a mass-merchandiser at a better price.

If no computer store is conveniently nearby, search the mail-order magazine ads for printers. It usually won't cost anything extra to order your printer and other equipment by phone, as most of the large mail-order houses publish toll-free numbers. Of course, you risk the possibility that the printer you ordered won't work, and you might encounter additional expense in sending it back for a replacement.

Before buying a printer, you might want to consider purchasing a printer stand. They cost from $20 to $100 at furniture and computer stores, and are frequently on sale. Those that prop up the printer a few inches above the table are helpful space savers, because they allow you to utilize the bottom-feed function of any printer that has that feature.

PERFECT PRINTER

When you purchase your printer, be sure to order a few extra ribbons and, if it's a daisywheel printer, a few extra print wheels. The ribbon that comes with the printer may have dried out a little from spending a long time in a warehouse. The added insurance of a few extra print wheels is easily realized on a Sunday evening when all the local stores are closed and the "a" cracks in half during the printout of a report due on Monday morning.

It's during the selection process that you'll have to choose between a parallel and a serial printer. If you opt for the serial design, you'll only have to contend with the serial cable, which plugs into the rear of your disk drive or computer.

If you get a parallel printer, however, you'll need to buy a Commodore-compatible parallel interface for connecting the printer to your computer system. Be sure to get an interface with graphics capability if you're going to be using software that creates graphs.

Bear in mind, however, that a parallel interface with graphics capability does not guarantee 100% software compatibility. There are too many hardware variables involved, especially with some of the older interfaces. Even though parallel interfaces usually specify the printers with which they're compatible, it's still a good idea to see a demonstration of its graphics capability with the printer you intend to buy.

Following is an exploration of some printers, both Commodore and non-Commodore. Commodore now offers three models—the MPS-803, DPS-1101 and MPS-1000. The popular MPS-801, MPS-802 and 1526 dot-matrix printers have all, unfortunately, gone the way of the buffalo nickel.

Commodore MPS-803

This is the least expensive dot-matrix Commodore printer you can buy. Reading the 803's accompanying owner's manual makes it apparent that Commodore had a good understanding of this printer's target audience—beginners. The manual discusses everything from setting up the printer to sending control codes to activate the unit's print features. There are plenty of examples detailing how to perform various print functions and how to incorporate print routines into your Basic programs.

I use an MPS-803 regularly for the testing of programs for *RUN*, and have become rather critical of its shortcomings, which include the lack of a tractor-feed unit as standard equipment, an inability to produce mailing labels efficiently, a slow (60 cps) print speed and a feeble character set that lacks descenders.

Yes, you can load continuous-feed paper into the unit without a tractor feed, but don't expect to print more than one or two pages without the paper becoming tilted to the left or right. Without a tractor-feed unit, creating mailing labels on the MPS-803 is a "maybe" proposition at best. Maybe you'll have good luck producing a few labels at a time, but forget about the effortless creation of a steady stream of them. But, as mentioned earlier, this printer was designed to be used by a beginner in a home environment.

One item worth mentioning about the MPS-803 is that it employs a cartridge instead of a spool ribbon. This is atypical of Commodore. The earlier low-end Commodore printers, such as the 1525, used traditional ink-spool ribbons. It's comforting to see Commodore using some of the newer printer-design technology on the MPS-803.



Commodore's MPS-803

Also on the plus side, the unit does a fair job of emulating a Commodore 1525 printer, although the commands used in opening and activating the print channels do vary slightly between the two printers. This variation in commands is significant enough so that you can create a print routine that will work on the 1525, but not on the MPS-803. The positive aspect of this variation is that

it gives 803 owners an opportunity to learn the fundamentals of programming printers by having to modify some programs.

High- and low-resolution screen-dump programs designed for the 1525 easily circumvent any variations between the two printers, and will work well on the MPS-803. The hard-copy reproduction of screens created by the 1525 will have roughly the same overall dimensions as those formed by the 803. However, there is usually a marked difference in appearance, because, although the 803 shares the same default size of line spacing, it has a smaller character set, resulting in a larger gap between lines.

If you want to learn the science of programming printers, look no further than the MPS-803.

Is this printer for you? If you want professional-looking text, speedy output and a wide range of print features, you'd do better with another choice. However, the MPS-803 does have its strengths. It has an attractive price (about $100 or less); its owner's manual is packed with helpful information detailing its capabilities; and its small size saves desk space.

If you're a beginner on a budget and want to learn the science of programming printers, look no further. This printer was made for you.

Commodore DPS-1101

Here is a big and brawny letter-quality printer from Commodore. The popular DPS-1101 has been on the market for about a year and a half, and the fact that several mail-order outfits are offering it for around $260 is helping it win a strong following.

The DPS-1101 has an appearance of high quality compared to Commodore printers such as the 1525, 1526, MPS-801 and MSP-802. With overall dimensions of 24 × 7 × 13.5 inches and a weight close to 30 lbs., it's a hefty piece of hardware.

Operating the DPS-1101 is a breeze. The user's manual is filled, in typical Commodore fashion, with enough sample programs to keep you busy trying out the printer's features for a week. A serial cable connects the printer to your computer system, and it is that same cable that, unfortunately, makes this printer incompatible with other computers.



Commodore's DPS-1101

The DPS-1101 is very noisy in operation, emitting a constant and pronounced whirring, whistling, chirping and clacking. Be forewarned: Use of this printer at night is guaranteed to awaken the children, pets and nearby neighbors if precautions are not taken to use it in a sound-proofed location.

Replacing the DPS-1101's wheel and ribbon couldn't be easier. The printer uses popular IBM Selectric ⅝-inch or equivalent printer ribbon cartridges. As for a print wheel, you can use Juki, Adler, Brother or any other print wheel that will fit properly.

The 1101 has 20 different print options. Activating any of them via control codes from Basic is easy, provided you're careful when converting the control codes listed in the user's manual from hexadecimal to decimal. Some of the more significant features include programmable tab settings, underlining, bold and shadow print and proportional spacing. These are not uncommon features for printers in the same price range, but it's nice to know the DPS-1101 has them.

Accessing the control codes from word-processing software is no problem, either. Word processors that allow you to embed control codes into the text will activate the DPS-1101's print features.

Most commercial software packages permit you to enter only decimal values to activate control codes. The DPS-1101's user's manual, however, lists only hexadecimal values for accessing the printer's unique features. Unless you've memorized the decimal equivalents of hexadecimal numbers up to $FF, you'll need a conversion chart handy as you load control codes into your software.

If you want a letter-quality printer at a reasonable price, the DPS-1101 is a good choice.

Since you can find 1101s on sale at most retailers for about $250 to $300, the printer is a good bargain. It's reliable, easy to use and loaded with convenient features. If you want a good letter-quality printer at a reasonable price, the DPS-1101 is a good choice.

Okidata 120

If Commodore had packed a printer such as its now-defunct 1526 with all the features of the Okidata 120, the chances are that it would have outsold all their other printers combined. The Okidata 120 offers more features and performance per dollar than any other printer, Commodore or third-party, in its price range.

One of the 120's strongest points is its 1525 emulation, which allows it to work well with software that utilizes 1525 print routines. Shortly after my first review of this printer (*RUN*, February 1986), a reader kindly informed me that the 120 is not the perfect 1525 clone—the overall dimensions of pictures created with Doodle (a commercial graphics package) are reduced by about one inch. The reason for the reduced size is that the Okidata has a smaller print size than the 1525.

You can rest assured that the Okidata 120 will reproduce high-resolution bit-mapped screens created on the C-64 and C-128. If duplicating the size of a 1525 printout is important to you, you'll be wise to test the printer with the software you intend to use with it before making your purchase.

YOU ARE THERE—

Conflict in Vietnam

puts you in command of the crucial battles of the Vietnam War. You have the world's most advanced weaponry and technology at your command. Is it a match for the fierce guerilla tactics of the Viet Cong?

From the siege of Dien Bien Phu to the battle of Khe Sanh, from the swirling American victory at Ia Drang to the wrenching South Vietnamese defeat at Quang Tri, you are there—in an exciting real-time historical simulation of the decisive battles of Vietnam.

Third in MicroProse's COMMAND SERIES, **Conflict in Vietnam** takes advantage of the system's real-time play and adds new elements unique to Vietnam: air strikes and artillery support, "airmobile" helicopter movement and the cat and mouse tactics of guerilla warfare. A special Player's Guide weaves together history and simulation to make strategy gaming a whole new experience.

Five different scenarios challenge your battlefield leadership with strategic and tactical decision-making, and provide continuous action and non-stop excitement. You will be in the thick of battle in minutes, even if you've never played a strategic simulation before.

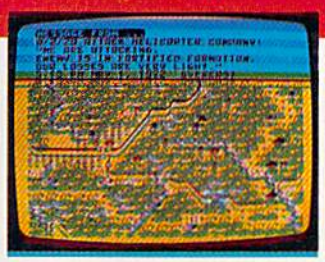
Experience all the dangers, defeats, and victories of more than 20 years of struggle in the jungles and rice paddies for control of Southeast Asia. You are in Command!



VIET NAM

AND, YOU'RE IN COMMAND!!



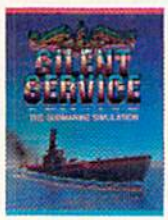


"Command Series" is available for Commodore 64/128, Apple II Family, Atari XL/XE, IBM PC/PC Jr. computers for a suggested retail of only $39.95. Call or write for more information or MC/VISA orders.

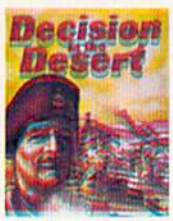
For Apple, includes Double Hi Res.
Disc includes both 64K & 128K versions.

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

Experience the reality of these other great simulations from MicroProse:



Exciting WWII Submarine Action in the South Pacific!!



You are in command—North Africa 1940-1942



Challenging and Exciting Air Combat from the Modern Electronic Cockpit!

MICROPROSE
SIMULATION • SOFTWARE

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

Circle 68 on Reader Service card.

The Okidata 120 has an appearance and ease of use that makes it a perfect companion for your Commodore computer system. Its sleek profile and compact design also make it appropriate for both home and office. Although it is the same color as the C-128 and its peripherals, it was designed just as much for the C-64. The majority of my testing was performed with a C-64, and the 120 performed as flawlessly with the C-64 as with the C-128.

The 120 performed as flawlessly with the C-64 as with the C-128.

The 120's name reflects its print speed in characters per second in Draft mode. It is capable of printing (and combining) three pica settings, three print modes, super- and subscripts and a host of other features typical of dot-matrix printers in this price range.

When this printer was reviewed in February, it did not contain a near-letter-quality (NLQ) character set. Newer versions—those distributed after March 1986—do. The NLQ characters consist of a 9 × 7 matrix and are selectable via both a front panel button and control codes.

When I first reviewed this printer, my biggest complaint was that the position of the printer's serial cable, on the rear of the unit, can interfere with the flow of paper into the unit. On the other hand, the position of the cable encourages the use of the printer's bottom form-feed feature on the front of the unit.



Okidata's 120

The Okidata 120 is one of the best low-end printers available for Commodore computers. With a price in the $220 to $240 range, you can't go wrong.

Star SG-10C

This serial printer from Star Micronics is a Commodore-dedicated version of the parallel-design Star SG-10, which replaced the popular Gemini 10X. Unlike the SG-10, the SG-10C has a built-in Commodore-dedicated interface and uses a serial cable to connect it with your computer system.

The SG-10C, at 15.2 × 12.4 × 5.7 inches, is a big printer. At 120 cps in Draft mode, it is also fast. Print options include NLQ, emphasized, double-width and reversed print. It also offers an italic character set and downloadable character capability.

It has some dated features, such as a big mechanical tractor-feed unit and a spool ink ribbon. While some low-end printer manufacturers have modernized printer lines with sleek tractor feeds and cartridge ribbons, the SG-10C still has some features that place it a few years behind in technology.

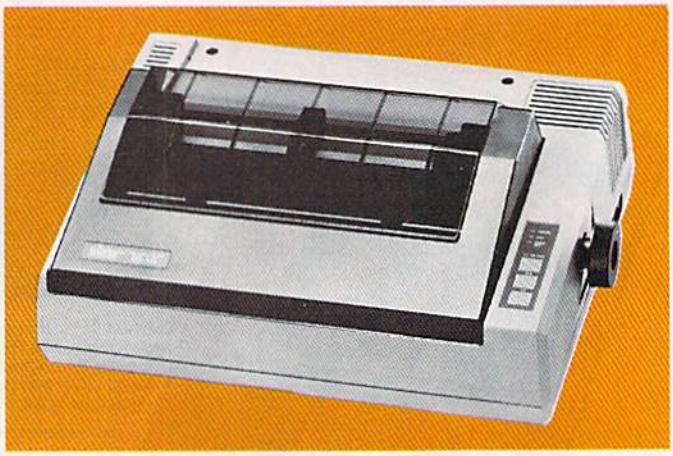
Other distinguishing characteristics of the SG-10C are an NLQ on/off button and light on the control panel and a light-brown plastic body, with a transparent, smoke-colored plastic cover over the platen and print-head area. The color of the printer's body matches that of the C-64 and its family of peripherals, but the SG-10C appears equally harmonious with the C-128.

Although the SG-10C was not originally capable of producing some of the print features you'd expect from a dot-matrix printer in its price range, a free firmware enhancement, called the SG-10 Special Edition, has been available through Star Micronics dealers since last December. This enhancement, consisting of a computer chip and documentation, provides control-code activation of NLQ, italic and double-strike characters.

It also gives you underlining and super- and subscript characters, three features that were previously missing. The enhancement goes a few steps further by providing your SG-10C with control-code-activated line and margin spacing, double-density graphics and a printer reset. All told, the SG-10 Special Edition is a must for all SG-10Cs that lack control-code print features.

Even though the SG-10C doesn't have the high-resolution bit-image reproduction capabilities of the parallel SG-10, it will work with some high-resolution screen dumps written for the 1525. And this brings up another important point. While the SG-10C seems to emulate a 1525 in some operations, you do have to modify some Basic 1525 print routines in order to get them to work with the 10C.

Of course, an inherent weakness of this printer and other Commodore-dedicated printers is that if you change from a Commodore computer system to another brand of computer, you'll have to invest in another printer. A Commodore-dedicated printer, because of its unique serial interface design, is not compatible with any other make of computer.



Star Micronics' SG-10C

Although the SG-10C is a sturdy, well-built unit that's easy to use with any Commodore computer, I am reluctant to recommend it. Though it originally retailed at a high $339, most computer stores now offer it for around $230 and up. But even at a cost under $250, the SG-10C seems overpriced because of its limitations.

Star SG-10 and SG-15

I don't hesitate to recommend the parallel SG-10, which is much more versatile than the SG-10C. As mentioned above, the SG-10 is the base printer from which the SG-10C originated. The SG-15, which has a 15-inch carriage and built-in 16K print buffer, is simply a larger version of the SG-10.

Introduced early in 1985, the SG-10 and 15 printers are the replacements for the popular Star Gemini 10X and 15X parallel printers. Both the 10 and 15 share some of the SG-10C's features, such as a big, removable tractor mechanism and a spool ink ribbon. The SG-10 possesses all of the 10C's useful features, such as the italic character set, the NLQ mode and 120 cps printing in Draft mode, but both the 10 and 15 offer more substantial and useful print features than the SG-10C.

Superscript and subscript characters are standard on both the SG-10 and SG-15.

The most important difference between the SG-10C and these two printers is that control codes, instead of dip switches, can be used with the SG-10 and SG-15 to activate some of the print features. You can isolate specific areas of text in word processors and other software to print underlined, italic and downloadable custom characters in your documents. Superscript and subscript characters, not available on the 10C, are standard on both the SG-10 and SG-15.

Both of them also have high-resolution, dot-addressable graphics capability, with seven density settings; and, instead of the SG-10C's two print pitches, controlled only by a dip switch, the 10 and 15 offer four print pitches accessed by control codes.

The advantages that these two parallel printers have over the SG-10C are obvious. On the other hand, the SG-10C has one clear advantage over the other two. With the SG-10C, you won't have to buy the parallel interface that's necessary in order to use the other two printers with your computer. Yet the interface is a small price to pay in view of the added versatility you get with the parallel printers.

A number of computer peripheral retailers have been offering the SG-10 for around $210 and the SG-15 for about $375. At these prices, they are both excellent bargains for the features they offer.

Next month, Part II of this article will bring you even more information on other major dot-matrix and letter-quality printers. R

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

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

Your Guide to Printer

	Super Graphix	MW-350	G-Wiz	Card?B	Uniprint	Printmaster /+G	PPI With Graphics Buffer
Manufacturer	Xetec	Micro R&D	Cardco	Cardco	Giga Int'l	Omnitronix	Data Share
Price	$99.95	$129	$69.95	$59.95	$69.95	$99.95	$49.95
Type:							
Graphics	✓	✓	✓		✓	✓	✓
matrix width	6/8	6/8	6/8	n/a	6	6	6
Text	✓	✓	✓	✓		✓	✓
Buffer Size	8K	4K	20 bytes**			16K ($89.95)	25 bytes
Reset Button	✓	✓				✓	
Printer Categories	8	5	6	ASCII	2	5	1
Operating Modes:							
Emulation of 1525	✓	✓			✓	✓	✓
Modified emulation	✓	✓	✓	✓		✓	✓
ASCII conversion	✓	✓		✓		✓	✓
Monitor:							
hexadecimal	✓		✓				
decimal		✓				✓	
Basic Listing Modes:							
Full graphics	✓	✓			✓	✓	✓
Mnemonics	✓	✓	✓	✓		✓	
Keystrokes	✓	✓					
ASCII values:							
hexadecimal	✓						
decimal			✓	✓		✓	
Setting Switches:	8	8	8	3		8	
Transparent	✓	✓	✓	✓			
Monitor mode			✓				
Linefeed		✓	✓	✓		✓	
ASCII conversion		✓				✓	
Device number	✓	✓	✓	✓		✓	
Printers	3	3	4			3	
Fonts	2						
Single/double density						✓	
Graphics reverse						✓	
Transparent Mode:							
Hardware	✓	✓	✓	✓			
Software	✓	✓	✓	✓		✓	✓
Soft lock	✓	✓	✓	✓		✓	✓
Linefeed Selection:							
Hardware		✓	✓	✓		✓	
Software	✓	✓	✓	✓	✓	✓	✓
Soft lock	✓	✓	✓	✓			✓
Interface Control:							
Secondary addresses	15	5	9	6	8	15	13
Secondary-address lock	✓	✓	✓	✓		✓	✓
Escape codes	24*	7				2	
Command channel	23					✓	
Special Features:							
Fonts:	3						
NLQ	built-in						✓
User	2						
Redefinable							✓
Built-in utilities							✓
Screen dumps:							
C-64:							
bit map	✓						
character	✓						
VIC-20:							
character	✓						

Footnotes

*—These escape codes control the printing of the built-in near-letter-quality (NLQ) mode and the downloadable fonts. Typical features include sub- and superscripts, expanded, compressed, emphasized and bold print, and underlining. This allows most standard printer features to be implemented with the interface-generated fonts. The Super Graphix Jr. supports only underlining with its NLQ font.

**—This buffer is a part of the interface's microprocessor. A separate RAM buffer is not built-in. These interfaces utilize the small buffer size to minimize head shuttle as much as possible.

***—The lock function on the Turboprint GC is only for the transparent modes.

Interfaces

By MORTON KEVELSON

Turboprint GC	The Connection	Super Graphix Jr.
Telesys	Tymac Control	Xetec
$59.95	$69.95/$73.95	$59.95
✓	✓	✓
6/8	6/8	6/8
✓	✓	✓
	2K	112 bytes**
	✓	
8	1****	8
✓	*****	✓
✓	✓	✓
		✓
		✓
	✓	
✓	✓	✓
✓		✓
✓		✓
		✓
	✓	
4	2	8
	✓	✓
	✓	✓
✓	✓	✓
3	1****	3
		1
	✓	✓
✓	✓	✓
✓	✓	✓
✓	✓	✓
***	✓	✓
	✓	✓
	✓	✓
20	9	8
***	✓	✓
	11	2*
		14
		1
		built-in

****—The interface must be ordered with a printer-specific ROM.

*****—This interface does not print reverse text. Reverse-text characters are printed as underlined regular characters.

Compatibility and price are only two considerations in choosing an interface. This handy chart shows you the printer features that various interfaces support.

Notes on the Chart.

The Type category identifies the interface as either a graphics or text device. Only a graphics interface will provide total emulation of the Commodore 1525 printer.

Matrix width refers to the number of printer bits the interface uses to generate the Commodore graphics characters. This should match the number of bits in the width of the printer's text characters.

The built-in RAM buffer serves two functions. A large buffer can store a quantity of text while waiting for the printer to accept additional data. This can speed operations by freeing up the computer much sooner. This advantage is greatest with slow, letter-quality printers.

The second advantage of a buffer is that it helps minimize the head shuttling with some graphics printers when they're emulating the Commodore graphics modes. This is most noticeable with printers that are unidirectional when printing bit graphics. (Epson and Epson clones fall into this category.) For maximum effectiveness in this application, a buffer size of at least one-half K is required.

The operating modes and the Basic listing modes show the various degrees of emulation possible with the interfaces. This indicates the readability of Basic program listings. Most of the interfaces print the ASCII codes of otherwise unlistable characters. The chart indicates if these values are in hexadecimal or decimal.

The monitor modes are handy debugging aids for printer routines.

The chart indicates the total number of setting switches and also the number of these switches that are dedicated to printer selection. Although three switches offer eight possible combinations, most interfaces do not take full advantage of this variety. The various hardware settings are important for applications that do not allow software selection of the interface's operating mode (e.g., cartridges that take control of the computer on power up). R

Address all author correspondence to Morton Kevelson, PO Box 260, Homecrest Station, Brooklyn, NY 11229.

List of Manufacturers

Cardco
300 S. Topeka
Wichita, KS 67202
316-267-6525

Xetec
3010 Arnold Road
Salina, KS 67401
913-827-0685

Data Share
717 South Emporia
Wichita, KS 67211
316-264-6118

Telesys
43334 Bryant St.
Fremont, CA 94539
415-651-2970

Micro R & D
3333 S. Wadsworth Blvd., #A104
Lakewood, CO 80227
303-985-4077

GIGA International Corp.
605 Broad Ave.
Ridgefield, NJ 07657
201-941-1800

Omnitronix
PO Box 43
Mercer Island, WA 98040
206-236-2983

Tymac Control Corp.
127 Main St.
Franklin, NJ 07416
201-827-4050

C-128 Ultra Hi-Res

By DAVID DARUS, KEN FRENCH and LOUIS WALLACE

Increase the flexibility of your existing C128 Ultra Hi-Res program with this set of powerful and swift graphics commands.

In *RUN*'s February 1986 issue, we announced that the C-128 was fully capable of using its 80-column RGB mode for ultra high-resolution (640 × 200 pixels) graphics. We also introduced you to the C-128 Ultra Hi-Res graphics language. This month, we will expand on that topic with several new additions to the command set.

The C-128 Ultra Hi-Res is a language that wedges itself into memory so that its commands are executed along with those of the normal Basic 7.0. Without slowing down normal Basic, it accomplishes this by intercepting the Syntax Error subroutine that issues error messages when you make a typing mistake.

All Ultra Hi-Res commands are preceded by the @ symbol, which is not used by Basic. When the C-128 Basic interpreter encounters this in the context of a command, it passes control to the Syntax Error subroutine, which would normally display a syntax error message and stop the program.

However, we have changed the vector that points to that subroutine. Instead, it points to a machine language subroutine that checks to see if the error is truly an error, or one of our new commands. If the latter, control is passed to the appropriate Ultra Hi-Res module; if not, it jumps to the normal Syntax Error subroutine.

The advantage of this wedge over others is that it allows Basic to run at top speed and checks for our routines only when they are encountered. If you combine this with the Fast command, which operates at 2 MHz, you'll have your C-128 running at full throttle with many new and powerful graphics commands.

To use Ultra Hi-Res, part 2, you'll need a copy of part 1. (See "Ultra Hi-Res Graphics," *RUN*, February 1986.) You will then combine all the commands to form an enhanced version (Ultra Hi-Res Version 1.1).

The Ultra Hi-Res 1.1 Programs

Three programs accompany this article. Carefully type them in and, before running them, save them to a disk containing both the old machine language version of the Ultra Hi-Res program and its Boot program.

First, load the program called UH.DATA (Listing 1) and run it in normal C-128 80-column mode, not in Ultra Hi-Res mode. It will create a number of binary files on the disk.

After running Listing 1, load and run the program called MAKEUH V1.1 (Listing 2). This program will first load into memory the old version of Ultra Hi-Res, then it will add the new modules. It will also rename the original version to Ultra Hi-Res.old and save a new version called Ultra Hi-Res. Ultra Hi-Res 1.1 is now ready for use. To activate it, load and run the Ultra Hi-Res Boot program, as you used it to load the original Ultra Hi-Res program.

The final program is called UH.PIC CONVERT (Listing 3). We've changed the original picture-file format to allow upward compatibility of Ultra Hi-Res pictures in future applications programs. Listing 3 allows you to change pictures made with version 1.0 to this new format. Place in the drive a disk that contains the pictures you want converted and answer the prompts. Your old Ultra Hi-Res pictures will now be fully compatible with Ultra Hi-Res 1.1.

Finally, to legally use this program to create applications you wish to give away, you must use the fifth new command,

RUN It Right

C-128 (in C-128 mode)

Graphics, Part 2

@WALRUS, which creates a logo crediting the program's authors. It is your legal obligation to display this logo for any non-personal use. (If you intend to sell your applications, please contact the authors about licensing.)

The Commands

Part 2 adds five new commands that give professional-level graphics power to the already-powerful Ultra Hi-Res command set. Combined with the C-128's large memory and 2 MHz clock speed, you will be able to use Basic to write very impressive applications programs.

The first new command—@CIRCLE—is also found in normal 40-column Composite mode and functions in the same way; however, with Ultra Hi-Res 1.1, you can only have two colors on screen at once, rather than the 16 available in 40-column mode. To compensate for this loss of color, you can change your drawing mode from Draw to Erase. The syntax is:

@CIRCLE,mode,cx,cy,xr,yr<,sa,ea,angle,increment>

Mode is 0 for erase and 1 for draw; cx is the x coordinate of the center (0–639); cy is the y coordinate of the center (0–199); xr is the x radius (1–319); yr is the y radius (1–100). The parameters within the brackets, < >, are optional. The sa is the starting angle (0–360); ea is the ending angle (0–360). These allow you to draw arcs easily. The angle is the number of degrees (0–360) you wish to rotate the circle, ellipse or arc. The increment is the number of degrees used in drawing the circle. By changing the increment, you can use the Circle command to draw polygons.

The defaults for the optional parameters are: sa = 0; ea = 360; angle = 0; and increment = 8. For more information on the circle parameters, see the C-128's system guide.

The second new command is called @PAINT. Unlike the 40-column Paint command, this one only provides one color at a time. This could be a problem when it comes to graphics and charts. The @Paint command compensates for this paucity of colors by allowing you to fill areas with varieties of different patterns. The syntax of the command is:

@PAINT,x,y,mode<,p1><,p2>
<,p3,p4><,p5,p6,p7,p8>

Here x is any value from 0–639; y is any value from 0–199; and mode is 0 (for erase) and 1 (for draw). The p values are numbers from 0–255 and represent the decimal values of the binary patterns used in the fill. For example, if you wanted to generate an interesting patchwork pattern to fill an area, you would use the following values.

01100110	102
11001100	204
00110011	51
10000001	129
10011001	153
01111110	126
00000000	0
10101010	170

The command format is:

@PAINT,x,y,1,102,204,51,129,153,126,0,170

This will fill a specified area with that pattern. If you do not enter any specified values, the area will be filled with a

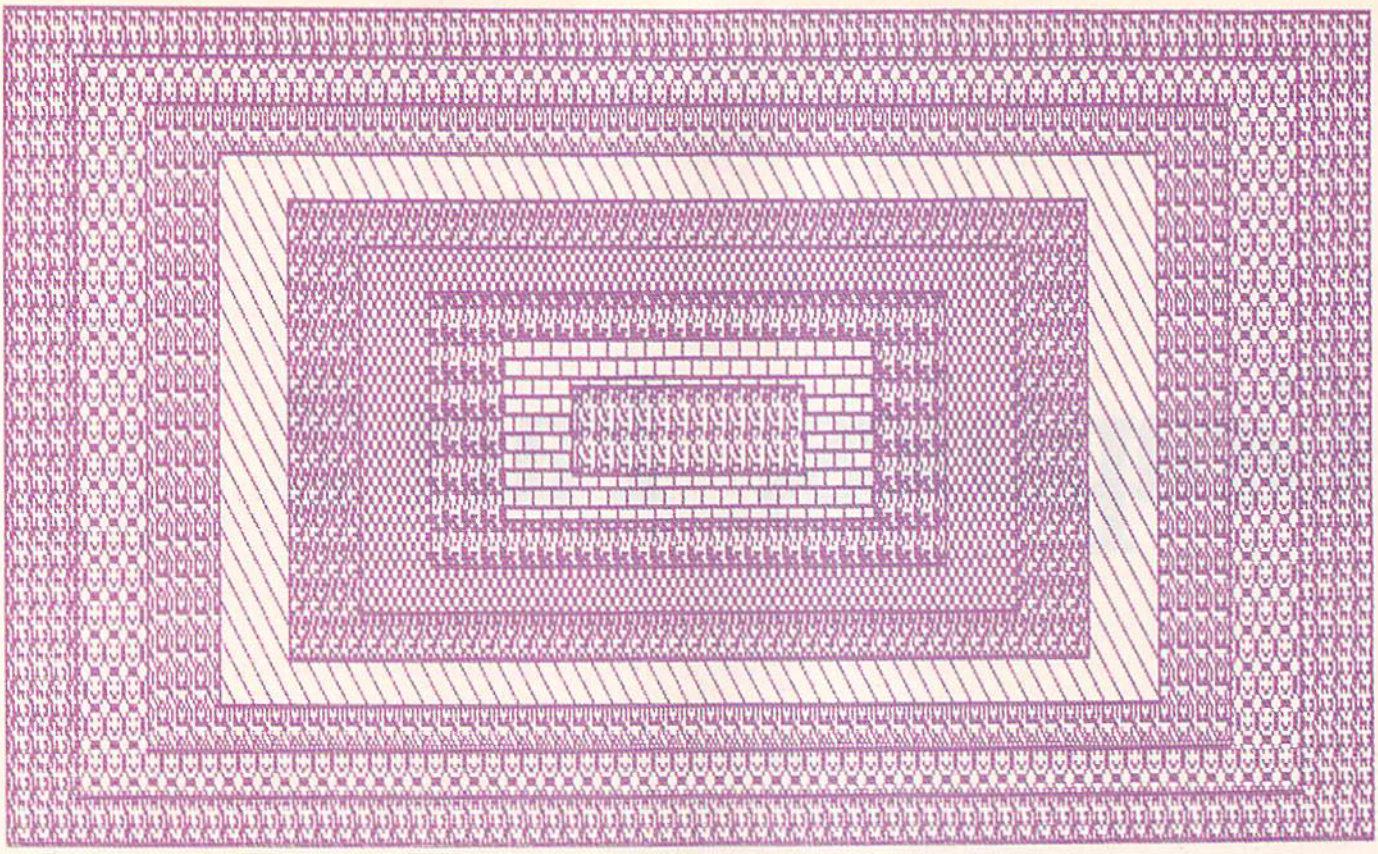


Photo 1. This is a sample of pattern paint. Some patterns were planned, others are simply random. You can use any 8×8 pixel pattern.

solid pattern. By entering only one number, its pattern is repeated eight times; if you enter two numbers, the pattern of the pair is repeated four times; if you enter four numbers, each pattern is repeated once.

You can clear a solid area (not a pattern) by using a mode of 0. You must make sure the area to be filled is completely enclosed or the pattern will leak out and fill the screen.

The third command is @HCOPY. This will dump the graphics screen to a printer in any of four different sizes. The syntax is:

@HCOPY,size, secondary address

The size is from 1–4, and the secondary address is whatever your printer interface requires for Graphics mode with no linefeeds. For example, the Cardco B and PPI with Graphics interfaces require a secondary address of 5. At the moment, only the Epson, Mannesmann Tally Spirit 80 and Olivetti PR2300 printers are supported, but additional modules will be added if the demand is there.

The fourth command is @DRWMOD. This sets up a special form of the Draw mode that performs an XOR on the screen when you use any of the drawing commands (Dot, Line, Box, Circle or Bar). It reverses lines on the screen. This command allows you to create the illusion of transparency when two points overlap. The syntax is:

@DRWMOD,mode

The mode is 0 or 1, with 0 indicating no complement and 1 indicating complement.

A Gem of a Program

You don't often find a graphics utility that enhances the usefulness of a computer for personal and professional applications. Ultra Hi-Res is a rarity that greatly extends the already-powerful features of the C-128. You will most likely discover many ways to use this new graphics power.

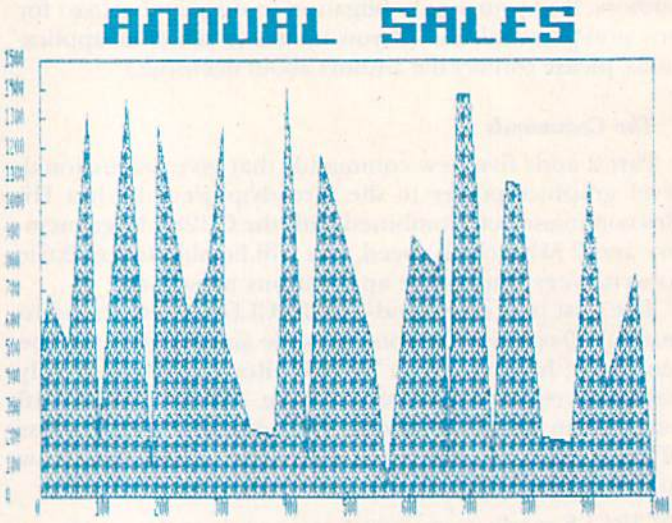


Photo 2. Screen display of a business chart.

Look forward to more articles on the inner workings of the 8563 video chip. Ultra Hi-Res is only one aspect of what this chip is capable of accomplishing. R

Address all author correspondence to Louis Wallace, 6124B SW 11th Place, Gainesville, FL 32607 or David Darus, 2508 NW 65th Terrace, Gainesville, FL 32606.

BATTERIES INCLUDED

"The Energized Software Company!"

We started with Commodore, designing programs that quickly became industry success stories. Now we're moving on, applying our expertise to other systems.
*Look for **Apple, Atari, IBM,** and **Commodore** software with the Batteries Included label!*

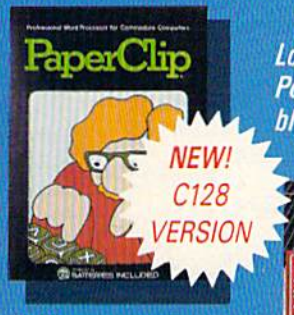
Look forward to excellence, in every respect. Power and performance, ease of use, incredibly low prices, for programs that help you in so many ways.



"The best Atari word-processor ever."
ANTIC MAGAZINE



"...capable of very large and complicated searches ...a very good system."
TPUG MAGAZINE



"Performance: excellent... Error-Handling: excellent... Value: excellent"
FAMILY COMPUTING
(a "Billboard" magazine #1 best seller)













"quite simply the best ...the highest rating possible."
ANALOG COMPUTING





Also from BATTERIES INCLUDED:

Calkit: problem-solving spreadsheet program with built-in templates for the most-needed home and business applications — including income tax, budgets and many more.

B/Graph: professional-quality graphics/charting and statistical analysis package turns your data into superb visuals.





B.I.-80 Column Display: add-on module doubles your screen capacity and improves visibility.

HOME ORGANIZER SERIES home database managers. (8 programs including Home Inventory, Recipes, CheckBook, Address Book, Audio/Video Catalogue and more)

NEW! FOR 1986
PAPERCLIP ELITE I•S TALK ISGUR PORTOLIO SYSTEM.
FOR THE AMIGA, ATARI ST and IBM/MS DOS SYSTEMS.

BATTERIES INCLUDED

"The Energized Software Company!"

30 Mural Street
Richmond Hill, Ontario
L4B 1B5 CANADA
(416) 881-9941
Telex: 06-21-8290

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

WRITE TO US FOR FULL COLOUR CATALOGUE of our products for COMMODORE, ATARI, APPLE and IBM SYSTEMS.

FOR TECHNICAL SUPPORT OR PRODUCT INFORMATION PLEASE PHONE (416) 881-9816.

SOME PROGRAMS ARE NOT AVAILABLE FOR ALL SYSTEMS.

Commodore, Apple, Atari and IBM PC are registered trademarks of Apple Computers, Inc., Atari, Inc., Commodore Business Machines, Inc., and International Business Machines, respectively

Listing 1. *UH.DATA program.*

```
1ØØ GRAPHIC1,1:GRAPHIC5:FAST          :REM*32
2ØØ PRINT"{SHFT CLR}{CRSR DN}MAKING PROGRAM
    FILES..."                          :REM*4
1ØØØ FORZ=1536ØTO15574:READY:POKEZ,Y:NEXT
                                       :REM*2Ø9
1ØØ1 DATA32,128,3,2Ø1,254,2Ø8,27,32 :REM*24
1ØØ2 DATA128,3,234,234,234,234,234,234
                                       :REM*27
1ØØ3 DATA234,234,234,234,234,234,234,234
                                       :REM*68
1ØØ4 DATA234,234,234,234,234,234,234,76
                                       :REM*97
1ØØ5 DATA2Ø1,33,2Ø1,226,2Ø8,3,76,8Ø :REM*84
1ØØ6 DATA55,2Ø1,68,2Ø8,3,76,82,6Ø  :REM*225
1ØØ7 DATA2Ø1,8Ø,2Ø8,3,76,1Ø3,6Ø,234 :REM*64
1ØØ8 DATA234,234,234,234,234,234,234,234
                                       :REM*73
1ØØ9 DATA234,234,234,234,234,234,234,234
                                       :REM*74
1Ø1Ø DATA234,234,234,234,76,248,33,76
                                       :REM*245
1Ø11 DATA67,33,162,4,32,128,3,221    :REM*34
1Ø12 DATA98,6Ø,2Ø8,243,2Ø2,16,245,76
                                       :REM*185
1Ø13 DATA123,6Ø,68,79,77,87,82,162 :REM*162
1Ø14 DATA3,32,128,3,221,119,6Ø,2Ø8  :REM*77
1Ø15 DATA222,2Ø2,16,245,76,144,6Ø,76
                                       :REM*168
1Ø16 DATA69,88,73,32,128,3,32,9     :REM*213
1Ø17 DATA136,138,2Ø8,6,169,13,141,159
                                       :REM*14
1Ø18 DATA36,96,169,77,141,159,36,96 :REM*17
1Ø19 DATA32,128,3,32,15,136,165,22 :REM*184
1Ø2Ø DATA141,35,55,165,23,141,36,55:REM*2Ø3
1Ø21 DATA32,9,136,142,34,55,173,Ø   :REM*2ØØ
1Ø22 DATA255,41,254,141,Ø,255,169,1:REM*191
1Ø23 DATA141,37,55,32,1Ø8,54,144,4 :REM*194
1Ø24 DATA169,1,2Ø8,2,169,Ø,133,25Ø :REM*152
1Ø25 DATA169,Ø,133,251,96,32,128,3   :REM*17
1Ø26 DATA162,Ø,32,224,34,169,33,141:REM*196
1Ø27 DATA235,49,32,122,34,96,Ø      :REM*1Ø3
1Ø3Ø BSAVE"P.ULTRA.K",BØ,P1536Ø TO P15574
                                       :REM*184
2ØØØ FORZ=9Ø35TO9529:READY:POKEZ,Y:NEXT
                                       :REM*17
2ØØ1 DATA173,Ø,255,41,254,141,Ø,255 :REM*62
2ØØ2 DATA173,196,49,133,252,173,197,49
                                       :REM*53
2ØØ3 DATA133,253,173,198,49,133,254,32
                                       :REM*48
2ØØ4 DATA191,48,165,252,41,7,17Ø,189 :REM*7
2ØØ5 DATA72,37,141,223,49,56,173,2ØØ:REM*78
2ØØ6 DATA49,237,196,49,141,2Ø4,49,173
                                       :REM*53
2ØØ7 DATA2Ø1,49,237,197,49,141,2Ø5,49
                                       :REM*236
2ØØ8 DATA56,173,2Ø2,49,237,198,49,141
                                       :REM*187
2ØØ9 DATA2Ø6,49,173,2Ø3,49,237,199,49
                                       :REM*7Ø
2Ø1Ø DATA141,2Ø7,49,173,2ØØ,49,141,196
                                       :REM*63
2Ø11 DATA49,173,2Ø1,49,141,197,49,173:REM*8
2Ø12 DATA2Ø2,49,141,198,49,173,2Ø3,49
                                       :REM*1Ø3
2Ø13 DATA141,199,49,169,Ø,141,217,49
                                       :REM*248
2Ø14 DATA44,2Ø5,49,16,23,173,2Ø4,49  :REM*7
2Ø15 DATA32,2Ø7,36,141,2Ø4,49,173,2Ø5
                                       :REM*92
2Ø16 DATA49,32,2Ø8,36,141,2Ø5,49,169:REM*47
2Ø17 DATA2,141,217,49,44,2Ø7,49,16 :REM*198
```

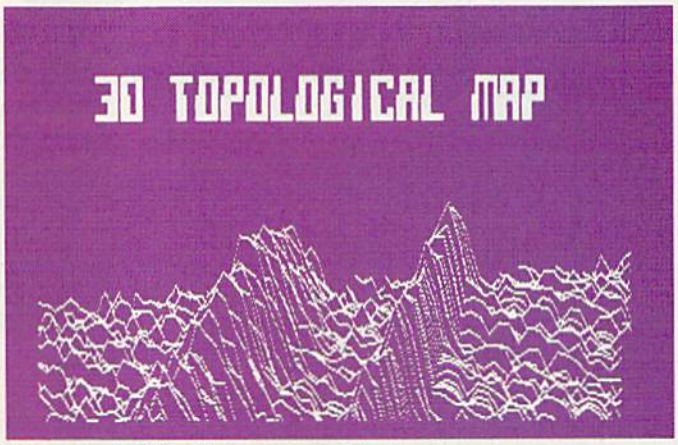


Photo 3. A 3-D effect generated by the program.

```
2Ø18 DATA27,173,2Ø6,49,32,2Ø7,36,141
                                       :REM*227
2Ø19 DATA2Ø6,49,173,2Ø7,49,32,2Ø8,36
                                       :REM*17Ø
2Ø2Ø DATA141,2Ø7,49,24,173,217,49,1Ø5
                                       :REM*249
2Ø21 DATA4,141,217,49,174,2Ø4,49,236
                                       :REM*23Ø
2Ø22 DATA2Ø6,49,173,2Ø5,49,168,237,2Ø7
                                       :REM*1Ø7
2Ø23 DATA49,16,27,173,2Ø6,49,141,2Ø4 :REM*8
2Ø24 DATA49,173,2Ø7,49,141,2Ø5,49,142
                                       :REM*177
2Ø25 DATA2Ø6,49,14Ø,2Ø7,49,24,173,217
                                       :REM*226
2Ø26 DATA49,1Ø5,8,141,217,49,173,2Ø4:REM*55
2Ø27 DATA49,32,2Ø7,36,141,214,49,173:REM*96
2Ø28 DATA2Ø5,49,32,2Ø8,36,141,215,49
                                       :REM*129
2Ø29 DATA56,48,1,24,11Ø,215,49,11Ø :REM*112
2Ø3Ø DATA214,49,16Ø,Ø,14Ø,212,49,14Ø
                                       :REM*219
2Ø31 DATA213,49,24Ø,55,174,217,49,24:REM*36
2Ø32 DATA173,214,49,1Ø9,2Ø6,49,141,214
                                       :REM*191
2Ø33 DATA49,173,215,49,1Ø9,2Ø7,49,141
                                       :REM*148
2Ø34 DATA215,49,48,2Ø,56,173,214,49 :REM*35
2Ø35 DATA237,2Ø4,49,141,214,49,173,215
                                       :REM*134
2Ø36 DATA49,237,2Ø5,49,141,215,49,232
                                        :REM*15
2Ø37 DATA32,192,36,238,212,49,2Ø8,3:REM*2ØØ
2Ø38 DATA238,213,49,142,216,49,173,7
                                       :REM*133
2Ø39 DATA5Ø,24Ø,2,169,128,141,224,49
                                       :REM*222
2Ø4Ø DATA32,183,36,32,161,48,141,221:REM*99
2Ø41 DATA49,32,183,36,173,223,49,44:REM*218
2Ø42 DATA224,49,48,8,73,255,45,221 :REM*1Ø5
2Ø43 DATA49,76,162,36,13,221,49,32 :REM*18Ø
2Ø44 DATA172,48,174,216,49,173,212,49
                                       :REM*1Ø7
2Ø45 DATA2Ø5,2Ø4,49,173,213,49,237,2Ø5
                                       :REM*1Ø2
2Ø46 DATA49,144,137,96,162,18,165,251
                                       :REM*113
2Ø47 DATA164,25Ø,76,145,48,189,25,37
                                       :REM*144
2Ø48 DATA141,2Ø5,36,189,41,37,141,2Ø6
                                       :REM*214
```

Continued on p. 92.

First, there was PHANTASIE™, one of the most popular fantasy role-playing games ever made.



Now, a new adventure begins...

Circle 25 on Reader Service card.

PHANTASIE II™

For no reason other than for perverse pleasure, the Dark Lord Nickademus fashioned an evil orb, through which he cast a curse on a beautiful island and its people.

Now, six intrepid adventurers under your guidance brave the cruel warlock's wrath to find and destroy his nefarious handiwork.

If you've played the original PHANTASIE, you may transfer those same characters to this sequel. If you haven't, don't worry. You can always start with new characters that range from mere humans to exotic, unearthly creatures.

This exciting adventure can start right away by a quick visit to your local computer/software or game store today!

If there are no convenient stores near you, VISA & M/C holders can order this $39.95 game by calling **toll-free 800-443-0100, x335.** To order by mail, send your check to: **STRATEGIC SIMULATIONS, INC.,** 1046 N. Rengstorff Ave., Mountain View, CA 94043. (California residents, add 7% sales tax.) Please specify computer format and add $2.00 for shipping and handling. All our games carry a "14-day satisfaction or your money back" guarantee. **WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES TODAY.**

ON DISK FOR 48K APPLE® II SERIES & C-64™.

PHANTASIE and PHANTASIE II coming soon on the ATARI® ST!

©Copyright 1986 by **STRATEGIC SIMULATIONS, INC.** All rights reserved.



A small section of the wilderness your band must explore.



A sample of recruits from the Adventurers' Guild.



You must map out dungeons and fend off hideous monsters.



Your group has found Pluto's Palace in the Netherworld.

APPLE, C-64 and ATARI ST are trademarks of Apple Computer, Inc., Commodore Electronics, Ltd., and Atari, Inc., respectively.

Swish!

Outshoot your opponent on home court with this popular one-on-one basketball game, Horse.

By MARK JORDAN

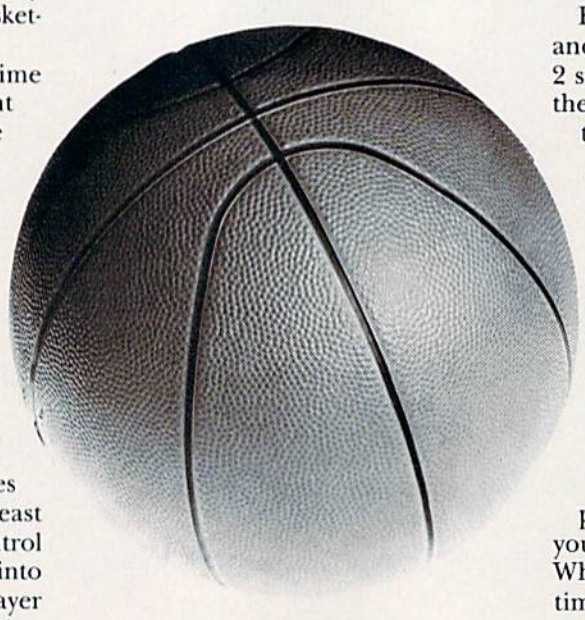
If the title of this program conjures up images of braying, sweating, racetrack animals, then it's obvious you're not from Indiana. Everybody here knows that Horse is a backyard basketball game. And it's fun because only one (and everybody's favorite) basketball skill is required—shooting.

The rules are simple: Each time you make a basket, your opponent must duplicate the shot. If he misses, he gets a letter from the word *horse*. If he succeeds, neither one of you receives a letter, and you simply continue making your shots. Once you miss, though, your opponent gets a free shot and a chance to turn the tables. The first player to spell out *horse* loses.

The computerized version of this game follows the same format as the backyard game. It requires two joysticks, two players and at least one good shooting eye. You control player 1 with a joystick plugged into port 2; your opponent controls player 2 with a joystick plugged into port 1.

You begin the game by moving your player anywhere on the court to shoot. You press the fire-button to position the ball for the shot, then press the button again, this time holding it down to control the ball's arc. When you feel the ball has achieved just the right height to begin its descent, you release the button.

The ball completes its upward climb with a neat loop and begins to fall. It nears the basket and, *swish*, falls through. A bell rings, and the word *good* appears beneath the scoreboard. The ball continues falling until it hits the floor, where it begins bouncing.



Now your opponent, player 2, hustles over to retrieve the ball and starts dribbling like mad. He quickly moves to the spot from which you made your shot. He must position himself within 16 pixels of your x,y shooting coordinates, or the shot won't go, and he will get a letter.

So, player 2 places himself where he thinks you were just positioned (you were smart; you moved away from your shooting location), and presses his fire-button. His sprite switches from dribbling to the ready-to-shoot position. He again presses and holds the fire-button, and the ball arcs gracefully to the basket. He releases. The ball descends.

Boing! It strikes the back of the rim and bounces high into the air. Player 2 sucks in his breath and watches as the ball comes down—*and through!*—the hoop. No H this time.

The game continues as player 1 grabs the ball and moves to a new location to shoot again. As long as he keeps making his "free" shots, he cannot lose. Once he misses, though, player 2 gets the free shot, and the tables are turned.

Do It with Style

Those are the basics; here are the embellishments. First, in computerized Horse, you'll find that you can change your shooting style. When you press the button the first time, you'll not only discover that you've maneuvered your man into the shooting posture, but that moving the joystick will no longer affect his screen position; he is frozen to that spot until the shot is completed.

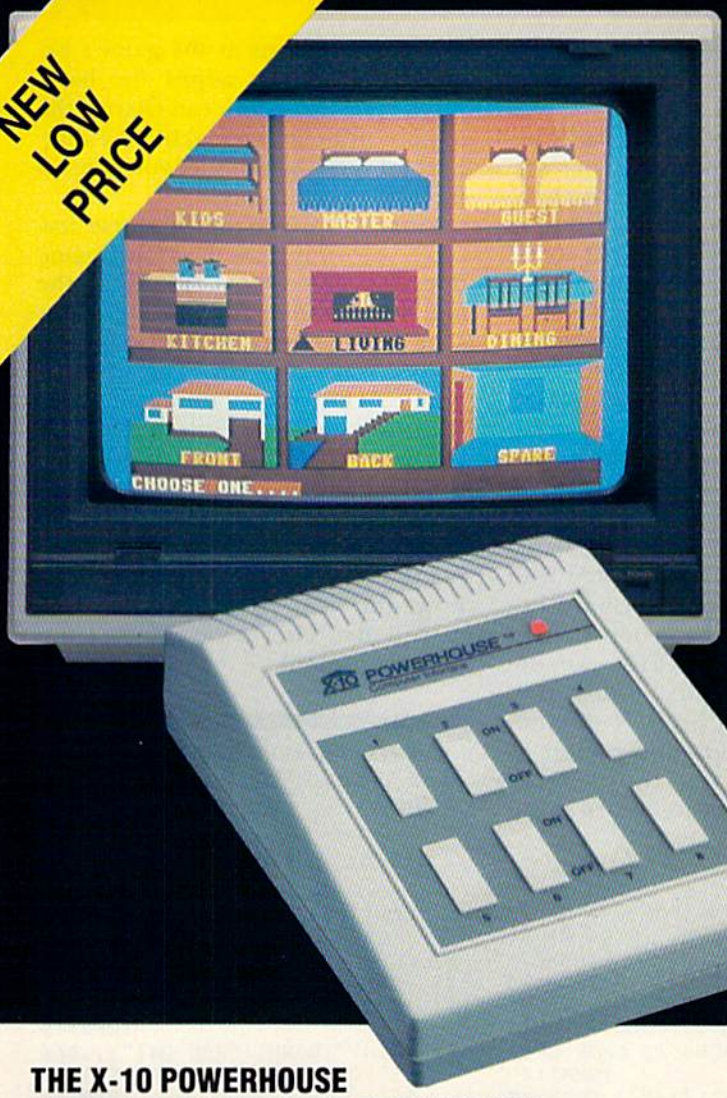
Now, by pushing upward on the stick while pressing the button to start the shot, the ball will rise on a much steeper path than before. This high-arc shot is especially good for close-in shots, such as lay-ups. Note that you can release the stick after you have pressed the button. The

RUN It Right

C-64; C-128 (in C-64 mode); two joysticks

NEW LOW PRICE

THE X-10 POWERHOUSE DOES EVERYTHING BUT PUT OUT THE CAT.



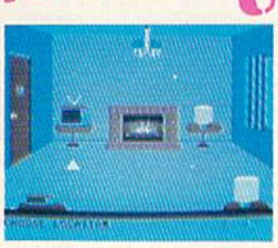
Model CP290

THE X-10 POWERHOUSE INTERFACES WITH YOUR COMMODORE TO CONTROL YOUR HOME...FOR SECURITY, COMFORT AND ENERGY SAVINGS.

This remarkable Interface lets you run your home through your Commodore 64 or 128 and a keyboard or joystick.

When you're away, it makes your home look and sound lived in. When you're home, it can turn off the TV at night and wake you up to stereo and fresh brewed coffee in the morning. It can even turn on your air conditioner and control your heating.

SPECIAL COLOR GRAPHICS MAKE PROGRAMMING A SNAP. You simply pick a room from the display screen. Use your keyboard or joystick to position graphics of lights or appliances. Then follow on-screen instructions to program any light or appliance to go on or off whenever you choose. You can even control thermostats, light intensity and more.



THE WAY IT WORKS. The X-10 Powerhouse Interface is cable-connected to the Commodore "User" port and plugged into a standard 110V outlet. After it is programmed, the Interface sends digitally encoded signals through your home wiring to special X-10 Modules. To control a lamp or appliance, you simply plug the electrical device into a Module and then plug the Module into an outlet. The Interface can control up to 256 Modules throughout your home and won't interfere with normal use of lights and appliances.



There are plug-in Appliance Modules, Lamp Modules, Wall Switch Replacement Modules and Special 220V Modules for heavy duty appliances such as water heaters and room air conditioners. Plus Thermostat Controllers for central heating and air conditioning, Telephone Responders to control your home from any phone, and much more.

HOT VOLUME PRICE! ALL THIS FOR UNDER $70!!

IT WON'T TIE UP YOUR COMPUTER. Use your computer only for programming. When you're finished, disconnect the Interface from the "User" or RS-232 port and keep it plugged into any convenient power outlet in your home. It will operate as a stand-alone controller with battery back-up and will run your home automatically.

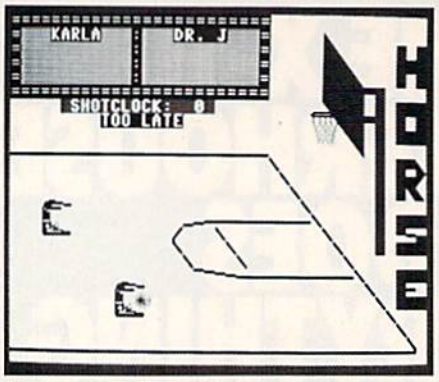
NEW LOW PRICE! A Powerhouse System including the interface, software, and connecting cables now costs less than $70. X-10 Modules are less than $17 each.

For the Dealer Nearest You Call: 1-800 526-0027
[in NJ: (201) 784-9700]
or, write to: X-10 (USA)
185A Legrand Avenue
Northvale, NJ 07647

X-10® POWERHOUSE
NUMBER ONE IN HOME CONTROL

Commodore 64 and Commodore 128 are registered trademarks of Commodore Int'l Ltd.

Circle 77 on Reader Service card.



Screen shot from Horse program.

high arc is selected at the instant you press the button and will remain that way throughout the shot.

If you'd like a low-arc shot, just point the joystick downward while pressing the fire-button for the second time.

The advantage of choosing a high- or low-arc shot is that, if you make the shot, your opponent will be forced to shoot the same arc. In fact, it won't matter if he pushes the joystick or not—the arc will mimic yours automatically.

The high-arc shot can be tricky because it sometimes arcs above the viewing range of the screen. You have to depend on your sense of timing to choose the exact moment to release the button. The low-arc shot is difficult because, just as in the real game of basketball, its sharp angle requires a finer shooting touch. Not only that, but low-arc shots are very difficult to bank in.

Did I mention bank shots? Yes, you can bank the ball off the backboard. If you choose the bankshot option at the opening of the game, all bankshots made must be duplicated with a bankshot, or the non-banking shooter will get another letter, whether or not he makes his shot. However, until you become familiar with Horse, I recommend you press N (for no) whenever the bankshot option is displayed.

Besides bankshots, you are given two other options at the game's beginning: You can adjust the ball's flight speed, and you can change the level of difficulty in making the shot. Both of these options let you control the difficulty of play.

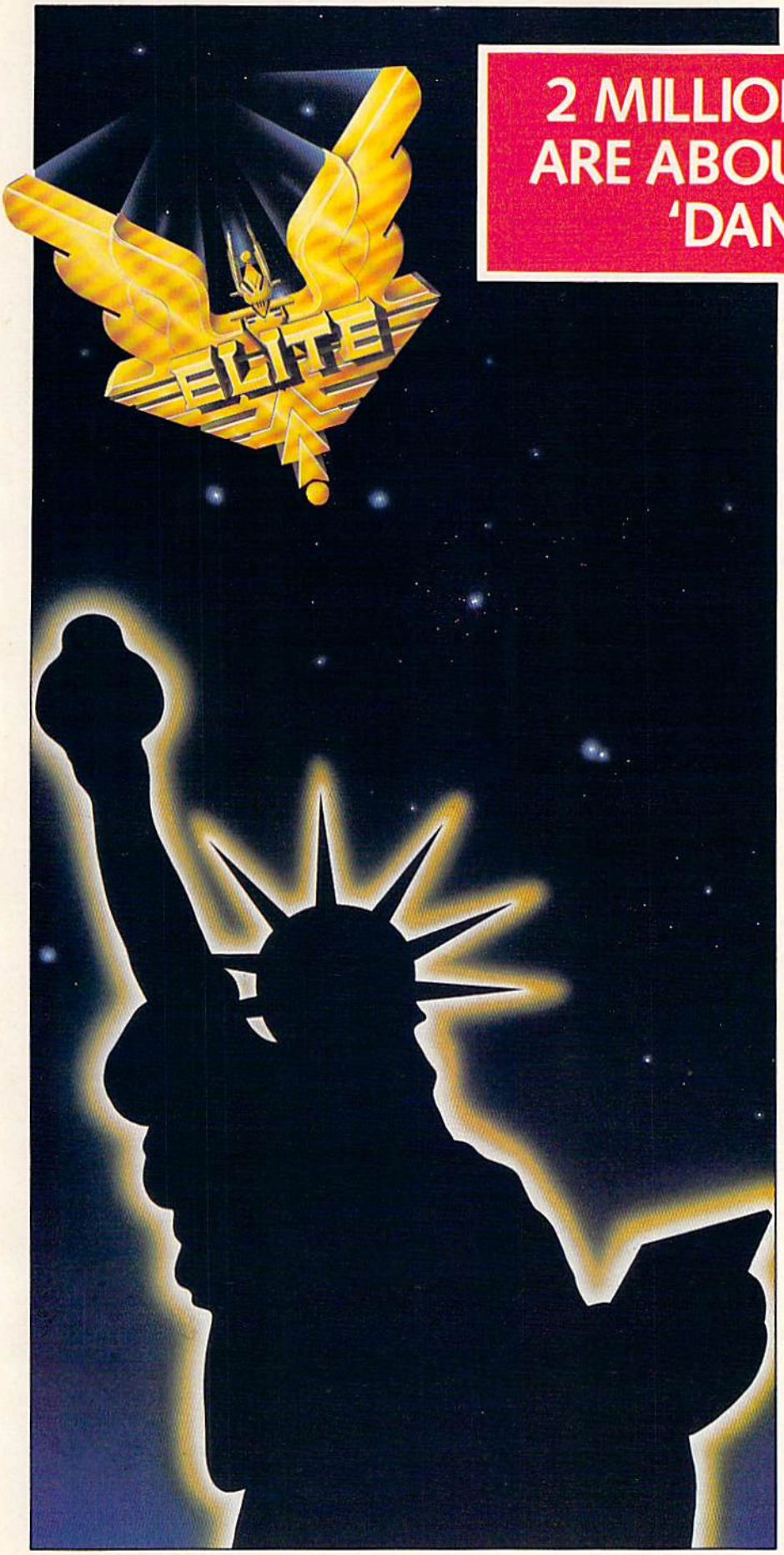
Finally, this version of Horse features something the backyard game doesn't have—a shot clock. When the ball hits the floor from the previous shot, you have exactly seven seconds to get your shot off. The clock is visible. The reason for having this feature is to put a little hustle into the game. It forces you to grab the rebound and move quickly into your opponent's old position. You can change the length of time by changing the value of CT in line 260 of the program.

Well, that's it. I hope you have fun horsing around. R

Address all author correspondence to Mark Jordan, 70284 C.R. 143, Ligonier, IN 46767.

Listing 1. *Horse program.*

```
10 POKE53281,13:POKE5328Ø,5
                              :REM*86
15 FORT=ØTO8:READH(T),L(T),D(T):
   NEXT                       :REM*133
2Ø IFPEEK(12288)=7THEN4Ø      :REM*22
25 PRINT"{SHFT CLR}{COMD 4}PLEAS
   E WAIT 11 SECONDS"         :REM*19
3Ø FORT=ØTO319:READA:POKE12288+T
   ,A:NEXT                    :REM*182
35 FORT=49152TO5Ø155:READA:POKET
   ,A:NEXT                    :REM*93
4Ø V=53248:POKEV+21,17        :REM*38
45 FORT=ØTO4:POKE2Ø4Ø+T,192+T:NE
   XT                         :REM*37
5Ø POKEV,35:POKEV+1,174:POKEV+39
   ,6                         :REM*188
55 POKEV+2,5Ø:POKEV+3,155:POKEV+
   4Ø,4:POKE2Ø41,192          :REM*119
6Ø POKEV+6,255:POKEV+7,1Ø2:POKEV
   +42,8                      :REM*1ØØ
65 POKEV+8,65:POKEV+9,179:POKEV+
   43,9                       :REM*171
7Ø SYS49158                   :REM*134
75 POKE7Ø8,1:S=54272:FORT=STOS+2
   4:POKET,Ø:NEXT             :REM*169
8Ø POKES+12,Ø:POKES+13,24Ø:POKES
   +24,15                     :REM*214
85 GOSUB47Ø                   :REM*167
9Ø INPUT"{SHFT CLR}{CRSR DN}{CTR
   L 7}{CTRL 9} PLAYER 1{CTRL Ø}
    (PORT 2)";P$(Ø):PØ=(11-LEN(P
   $(Ø)))/2                   :REM*142
95 POKEV+39,4                 :REM*23
1ØØ INPUT"{CTRL 5}{CTRL 9} PLAYE
   R 2{CTRL Ø} (PORT 1)";P$(1):
   P1=(11-LEN(P$(1)))/2:REM*24Ø
1Ø5 INPUT"{CTRL 9}{COMD 5} WHAT
   LEVEL (EASY Ø - 9 HARD) {CTR
   L Ø} 5{3 CRSR LFs}";LV:POKE6
   93,242+LV                  :REM*47
11Ø INPUT"{CTRL 9} BALL SPEED (F
   AST Ø - 9 SLOW){CTRL Ø}{2 SP
   ACEs}5{3 CRSR LFs}";BL:KL=BL
   +3:BL=BL+1                 :REM*23Ø
115 INPUT"{CTRL 9}{COMD 7} MATCH
    BANKSHOTS (Y/N) {CTRL Ø} N{
   3 CRSR LFs}";BS$           :REM*25
12Ø POKE7Ø8,Ø:POKEV+39,6      :REM*94
125 TM$="{HOME}{6 CRSR DNs}{5 CR
   SR RTs}{CTRL 9}{COMD 7} SHOT
   CLOCK:{4 SPACEs}{3 CRSR LFs}
   "                          :REM*141
13Ø M$=LEFT$(TM$,12)+"{3 CRSR RT
   s}{CTRL 1}{CRSR DN} {CTRL 9}
   "                          :REM*38
135 SP$="{HOME}":HL$="{CRSR RT}H
   {CRSR RT}O{CRSR RT}R{CRSR RT
   }S{CRSR RT}E":PL$="{COMD 7}{
   CTRL 9}{1Ø SPACEs}"        :REM*249
14Ø FORT=1TO4Ø:CL$=CL$+"{CRSR RT
   }":SP$=SP$+"{CRSR DN}":NEXT
                              :REM*94
145 P3$="{HOME}{CRSR DN}"+CL$
                              :REM*121
15Ø P$(Ø)="{CTRL 7}"+LEFT$(P3$,P
   Ø+3)+P$(Ø)                 :REM*224
155 PH$(Ø)="{CTRL 7}{HOME}{3 CRS
   R DNs}{CRSR RT}":PH$(1)=PH$(
   Ø)+"{12 CRSR RTs}"         :REM*229
16Ø P$(1)="{CTRL 5}"+LEFT$(P3$,P
   1+15)+P$(1)                :REM*26
165 S$="{CTRL 1}{CTRL 9}=======
   ================":SS$="{CTR
   L 1}{CTRL 9}={CTRL 4}{11 SPA
   CEs}{CTRL 1}:{CTRL 4}{11 SPA
   CEs}{CTRL 1}="             :REM*155
17Ø PRINT"{SHFT CLR}"S$:FORT=1TO
   4:PRINTSS$:NEXT            :REM*36
175 PRINTS$"{HOME}{CRSR DN}"P$(Ø
   )P$(1)                     :REM*147
18Ø BA$="{CTRL 7}{CTRL 9}{COMD *
   }{CRSR DN}{CRSR LF} {COMD *}
   {CRSR DN}{2 CRSR LFs}{2 SPAC
   Es}{COMD *}{CRSR DN}{3 CRSR
   LFs}{3 SPACEs}{COMD *}{CRSR
   DN}{4 CRSR LFs}{4 SPACEs}{CO
   MD I}{CRSR DN}{5 CRSR LFs}{C
   TRL Ø}{COMD *}{CTRL 9}{3 SPA
   CEs}{CRSR DN}{3 CRSR LFs}{CT
   RL Ø}{COMD *}{CTRL 9}{2 SPAC
   Es}{COMD I}{CRSR DN}{3 CRSR
   LFs}{CTRL Ø}{COMD *}{CTRL 9}
    {CRSR DN}{CRSR LF}{CTRL Ø}{
   COMD *}"                   :REM*4Ø
185 FORT=ØTO11:BB$=BB$+"{CTRL 9}
   {CRSR DN}{CRSR LF} ":NEXT
                              :REM*19
19Ø PRINT"{HOME}{CRSR DN}",,,BA$
   "{5 CRSR UPs}{2 CRSR RTs}"BB
   $                          :REM*66
195 FORT=1TO14:DI$=DI$+"{CTRL 1}
   {CRSR DN}{SHFT M}":NEXT
                              :REM*75
2ØØ FORT=1TO25:D$=D$+"{CTRL 1}{C
   OMD P}":E$=E$+"{CTRL 1}{COMD
    Y}":NEXT                  :REM*46
2Ø5 E$=E$+LEFT$(E$,28)+"{HOME}"
                              :REM*127
21Ø PRINTLEFT$(SP$,1Ø);D$;DI$"{C
   RSR RT}"E$                 :REM*254
215 F$="{CTRL 1}{COMD P}{SHFT R}
   {1Ø SHFT Fs}{CRSR DN}{13 CRS
   R LFs}{SHFT N}{3 CRSR RTs}{S
   HFT M}{CRSR DN}{5 CRSR LFs}{
   SHFT M}{4 CRSR RTs}{SHFT M}{
   CRSR DN}{5 CRSR LFs}{SHFT M}
   {4 CRSR RTs}{SHFT M}":REM*53
22Ø F$=F$+"{CRSR DN}{5 CRSR LFs}
   {COMD Y}{SHFT E}{SHFT D}{SHF
   T C}{11 SHFT Fs}"          :REM*7Ø
225 PRINTLEFT$(SP$,15),,"{3 CRSR
    LFs}"F$                   :REM*191
23Ø HH$="{COMD 4}{CTRL 9} {CRSR
   RT} {CRSR DN}{3 CRSR LFs}{3
   SPACEs}{CRSR DN}{3 CRSR LFs}
    {CRSR RT} {2 CRSR DNs}{3 CR
   SR LFs}"                   :REM*154
235 HO$="{CTRL 9}{3 SPACEs}{CRSR
    DN}{3 CRSR LFs} {CRSR RT} {
   CRSR DN}{3 CRSR LFs}{3 SPACE
   s}{2 CRSR DNs}{3 CRSR LFs}"
                              :REM*219
24Ø HR$="{CTRL 9} {COMD P}{COMD
   *}{CRSR DN}{3 CRSR LFs} {COM
   D Y}{CTRL Ø}{SHFT LB.}{CRSR
   DN}{3 CRSR LFs}{CTRL 9} {CTR
   L Ø}{COMD *}{CTRL 9}{COMD *}
   {2 CRSR DNs}{3 CRSR LFs}"
```



2 MILLION AMERICANS ARE ABOUT TO BECOME 'DANGEROUS'

You could be one.

Play **Elite** – it's totally stunning.

Elite is Britain's 1985 Adventure Game of the Year, an interstellar mind-game with incredible 3D Vector-Graphic space flight simulation

Take command of your Cobra MK III combat craft, trade with alien cultures on over 2000 planets in eight galaxies. Pick your destination on the starmap, checking out the computer's 4-way viewscan – and you're ready for your first jump thru hyperspace.

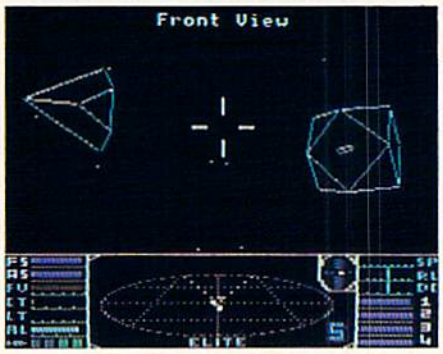
As a rookie you start with 'Harmless' status but with the right stuff and combat skills, you'll win ratings of 'Average' to 'Dangerous' – with your ultimate objective to become one of the **Elite**.

It's big, it's fast and it's here now for the **Commodore 64™** and **128™** complete with Manual, Novel, Control Guide, Ship Identification Chart, Keyboard Overlay **and** the opportunity as the US competition winner to get flown to London, England to try for the Elite World Championship.

It's so addictive it's been called "the Game of a Lifetime".

Elite.

Be dangerous.



FIREBIRD

P.O. BOX 49 RAMSEY
NEW JERSEY 07446 USA.

Circle 99 on Reader Service card.

GOLD EDITION

FIREBIRD HOTLINE ☎: 201 934 7373

Listing 1 continued.

```
                                :REM*82
245 HS$="{CTRL 9}{3 SPACEs}{CRSR
     DN}{3 CRSR LFs}{COMD I}{CTR
    L Ø}{SHFT *}{COMD I}{CRSR DN
    }{3 CRSR LFs}{CTRL 9}{3 SPAC
    Es}{2 CRSR DNs}{3 CRSR LFs}"
                                :REM*55
25Ø HE$="{CTRL 9}{3 SPACEs}{CRSR
     DN}{3 CRSR LFs} {CTRL Ø}{SH
    FT *}{CRSR DN}{2 CRSR LFs}{C
    TRL 9}{3 SPACEs}{2 CRSR DNs}
    {3 CRSR LFs}"               :REM*222
255 H$="{CTRL 5}"+HH$+HO$+HR$+HS
    $+HE$:PRINT"{HOME}{2 CRSR DN
    s}",,,"{7 CRSR RTs}"H$"{HOME
    }"                          :REM*185
26Ø X=1:CT=7:POKEV+21,27:POKE254
    ,Ø:POKE253,Ø                :REM*1Ø5
265 PRINTTM$;CT                 :REM*46
27Ø X=-X:POKE7Ø1,Ø:POKE698,1
                                :REM*23
275 XX=Ø:X1=1:IFX=1THENXX=1:X1=Ø
                                :REM*198
28Ø IFPEEK(1282)=176THENPOKE698,
    Ø:GOSUB4Ø5:GOTO265          :REM*47
285 GOSUB48Ø:IFBU<>ØTHEN28Ø
                                :REM*236
29Ø GOSUB32Ø:IFK=ØTHEN265:REM*89
295 PRINTTM$;CT:SYS49152:REM*254
3ØØ IFPEEK(253)=ØTHENGOSUB395:GO
    TO315                       :REM*2Ø5
3Ø5 IFBS$="Y"ANDL=1ANDPEEK(7Ø5)=
    ØTHENGOSUB415:GOTO315
                                :REM*228
31Ø GOSUB41Ø                    :REM*41
315 SYS49155:GOTO27Ø            :REM*2Ø6
32Ø POKE698,Ø:POKE7Ø1,1:POKE254,
    XX                          :REM*51
325 O1=XY:O2=YX:XY=PEEK(V+1+X):Y
    X=PEEK(V+2+X):K=1           :REM*244
33Ø IFPEEK(253)=ØTHEN35Ø:REM*179
335 L=L+1:IFL>1THENL=Ø:GOTO35Ø
                                :REM*16Ø
34Ø IFPEEK(1282)=176THENGOSUB4Ø5
    :POKE698,Ø:K=Ø:RETURN
                                :REM*1Ø1
345 IFABS(XY-O1)>16ORABS(YX-O2)>
    16THENGOSUB4ØØ:K=Ø:RETURN
                                :REM*124
35Ø POKE2Ø4Ø+XX,193             :REM*119
355 POKEV+8,PEEK(V+1+X)+3:POKEV+
    9,PEEK(V+2+X)-4             :REM*4
36Ø GOSUB48Ø:IFBU<>16THEN36Ø
                                :REM*91
365 GOSUB48Ø:IFBU<>ØTHEN365
                                :REM*13Ø
37Ø IFL=1THEN39Ø                :REM*115
375 POKE682,1:POKE683,1:POKE692,
    KL                          :REM*216
38Ø IFSW=14THENPOKE682,2:POKE683
    ,1:GOTO39Ø                  :REM*91
385 IFSW=13THENPOKE682,1:POKE683
    ,2:POKE692,BL               :REM*226
39Ø POKE2Ø4Ø+XX,192:RETURN
                                :REM*85
395 PRINTM$" MISSED ":GOSUB435:R
    ETURN                       :REM*2ØØ
4ØØ PRINTM$"{CRSR LF} TOO FAR ":
    GOSUB425:RETURN             :REM*2Ø7
4Ø5 PRINTM$"TOO LATE":GOSUB42Ø:R
    ETURN                       :REM*192
41Ø PRINTM$"{2 SPACEs}GOOD{2 SPA
    CEs}":BK=PEEK(7Ø5):RETURN
                                :REM*153
415 PRINTM$" NOBANK ":GOSUB43Ø:R
    ETURN                       :REM*138
42Ø IFPEEK(253)=1THENL=L+1
                                :REM*225
425 POKE254,X1:POKEV+9,PEEK(V+2+
    (-X))+7                     :REM*88
43Ø POKE253,Ø:GOSUB5ØØ          :REM*45
435 IFL=ØTHENRETURN             :REM*168
44Ø N(XX)=N(XX)+2:LL$=LEFT$(HL$,
    N(XX)):PRINTPH$(XX);LL$
                                :REM*237
445 IFN(XX)=1ØTHEN455           :REM*224
45Ø L=Ø:BK=Ø:RETURN             :REM*123
455 POKE698,Ø:GOSUB47Ø:PRINT"{HO
    ME}{6 CRSR DNs}{COMD 4} PRES
    S {CTRL 9} Y {CTRL Ø} TO PLA
    Y AGAIN"                    :REM*128
46Ø GETA$:IFA$<>"Y"THEN46Ø
                                :REM*65
465 RUN                         :REM*252
47Ø FORT=ØTO8:POKES+7,L(T):POKES
    +8,H(T)                     :REM*85
475 POKES+11,33:FORI=1TOD(T)*75:
    NEXT:POKES+11,32:NEXT:RETURN
                                :REM*146
48Ø JOY=PEEK(5632Ø+PEEK(254)):BU
    =JOYAND16:SW=JOYAND15:RETURN
                                :REM*221
485 POKEV+1Ø,(PEEK(V)+1)AND255:G
    OTO485                      :REM*12Ø
49Ø POKEV+21,59:POKEV+9,137
                                :REM*45
495 POKEV,1ØØ:POKEV+2,14Ø:POKEV+
    1,131:POKEV+3,131:POKEV+1Ø,1
    ØØ:POKEV+11,1Ø6             :REM*24Ø
5ØØ S=54272:POKES+13,249:POKES+1
    4,252:POKES+8,7:POKES+11,33:
    POKES+11,32                 :REM*117
5Ø5 FORT=1TO1ØØØ:NEXT:RETURN
                                :REM*236
51Ø DATA 4,48,2,5,152,2,5,71,2,4
    ,18Ø,2,4,48,4,4,18Ø,2,3,134,
    4,4,48,2,2,2Ø4,16           :REM*19
515 DATA 7,224,Ø,63,255,128,127,
    255,255,127,Ø,127,255,255,Ø,
    223                         :REM*215
52Ø DATA 255,Ø,24Ø,Ø,Ø,254,Ø,Ø,2
    54,Ø,Ø,254,Ø,Ø,254,Ø        :REM*58
525 DATA Ø,254,Ø,Ø,13Ø,Ø,Ø,255,2
    4,Ø,247,96,Ø,235,236,Ø
                                :REM*75
53Ø DATA 247,12Ø,Ø,25Ø,255,128,2
    45,85,254,255,255,255,127,25
    5,254,128                   :REM*19Ø
535 DATA 3Ø,Ø,Ø,3Ø,Ø,Ø,28,Ø,Ø,62
    ,Ø,Ø,62,Ø,Ø,62              :REM*71
54Ø DATA Ø,Ø,52,Ø,Ø,63,Ø,Ø,31,12
    8,Ø,31,255,128,31,255
                                :REM*246
545 DATA 192,31,224,Ø,63,128,Ø,3
    2,128,Ø,53,236,Ø,58,251,Ø
                                :REM*177
55Ø DATA 53,222,Ø,58,187,128,53,
    85,254,63,255,255,31,255,254
    ,77                         :REM*6
555 DATA Ø,Ø,Ø,Ø,Ø,Ø,3,255,128,1
    5,1,224,25,252,48,48        :REM*7
56Ø DATA 231,248,1Ø2,1ØØ,28,64,3
    6,156,2Ø7,36,62,2Ø7,36,158,2
    43,252                      :REM*62
565 DATA 2Ø6,2Ø1,191,254,2Ø1,25,
    158,194,73,158,2Ø1,9,158,73,
    72,68                       :REM*119
57Ø DATA 67,248,68,63,7,248,24,1
    12,48,15,255,224,3,255,128,1
    78                          :REM*23Ø
575 DATA Ø,Ø,Ø,Ø,Ø,127,63,255,25
    5,245,85,127,127,255,255,33
                                :REM*9
58Ø DATA 17,8,33,17,8,33,17,8,33
    ,17,8,18,17Ø,144,2Ø,68
                                :REM*222
585 DATA 8Ø,8,17Ø,32,9,17,32,1Ø,
    4Ø,16Ø,5,69,64,4,17Ø,64
                                :REM*93
59Ø DATA 5,17,64,2,17Ø,128,2,68,
    128,2,68,128,Ø,Ø,Ø,Ø        :REM*18
595 DATA Ø,Ø,Ø,Ø,127,Ø,1,241,192
    ,3,252,96,7,182,24Ø,7
                                :REM*129
6ØØ DATA 255,24Ø,5,255,2Ø8,7,127
    ,112,3,237,224,1,255,192,Ø,1
    27                          :REM*66
6Ø5 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
    ,Ø,Ø,Ø,Ø{7 SPACEs}          :REM*1Ø1
61Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
    ,Ø,Ø,Ø,77{6 SPACEs}         :REM*84
615 DATA 76,87,193,76,242,194,16
    9,Ø,16Ø,8Ø,153,167,2,136,2Ø8
    ,25Ø                        :REM*71
62Ø DATA 133,253,133,254,133,251
    ,169,22Ø,133,252,141,17Ø,2,1
    41,171,2                    :REM*74
625 DATA 169,253,141,175,2,169,2
    54,141,172,2,169,Ø,16Ø,24,15
    3,Ø                         :REM*2Ø1
63Ø DATA 212,136,2Ø8,25Ø,169,15,
    141,24,212,12Ø,169,7Ø,141,2Ø
    ,3,169                      :REM*138
635 DATA 192,141,21,3,88,96,173,
    3Ø,2Ø8,141,177,2,173,196,2,2
    4Ø                          :REM*125
64Ø DATA 6,238,Ø,2Ø8,238,8,2Ø8,1
    73,186,2,24Ø,2Ø,2Ø6,182,2,2Ø
    8                           :REM*224
645 DATA 2Ø,2Ø6,2,5,173,2,5,2Ø1,
    177,176,5,162,Ø,142,186,2
                                :REM*131
65Ø DATA 169,6Ø,141,182,2,173,18
    9,2,2Ø8,65,173,174,2,2Ø8,6,2
    Ø6                          :REM*92
655 DATA 9,2Ø8,76,136,192,238,9,
    2Ø8,166,254,24Ø,1,232,24,189
    ,Ø                          :REM*67
66Ø DATA 2Ø8,1Ø5,1Ø,141,8,2Ø8,56
    ,173,9,2Ø8,253,1,2Ø8,2Ø1,1,1
    44                          :REM*2
665 DATA 7,2Ø1,1Ø,176,11,76,187,
    192,238,9,2Ø8,169,1,76,181,1
    92                          :REM*111
67Ø DATA 2Ø6,9,2Ø8,169,Ø,141,174
    ,2,32,131,195,16Ø,1,162,2,19
    6                           :REM*244
675 DATA 254,24Ø,8,169,Ø,141,169
    ,2,76,2Ø8,192,169,1,141,169,
    2                           :REM*163
68Ø DATA 173,189,2,24Ø,8,173,169
    ,2,24Ø,3,76,43,193,177,251,7
    4                           :REM*214
685 DATA 176,2Ø,72,189,1,2Ø8,2Ø1
    ,112,24Ø,11,222,1,2Ø8,173,16
    9,2                         :REM*199
69Ø DATA 24Ø,3,2Ø6,9,2Ø8,1Ø4,74,
    176,2Ø,72,189,1,2Ø8,2Ø1,22Ø,
    24Ø                         :REM*4
695 DATA 11,254,1,2Ø8,173,169,2,
    24Ø,3,238,9,2Ø8,1Ø4,74,176,1
    2                           :REM*45
7ØØ DATA 72,189,Ø,2Ø8,2Ø1,24,24Ø
    ,3,222,Ø,2Ø8,1Ø4,74,176,12,7
    2                           :REM*248
7Ø5 DATA 189,Ø,2Ø8,2Ø1,24Ø,176,3
    ,254,Ø,2Ø8,1Ø4,162,Ø,136,2Ø8
    ,3                          :REM*135
71Ø DATA 76,191,192,238,175,2,24
    Ø,3,76,187,192,169,253,141,1
    75,2                        :REM*148
715 DATA 76,49,234,138,72,152,72
    ,174,18Ø,2,16Ø,Ø,136,2Ø8,253
    ,2Ø2                        :REM*47
72Ø DATA 2Ø8,248,1Ø4,168,1Ø4,17Ø
    ,96,169,Ø,16Ø,1Ø,153,187,2,1
    36,2Ø8                      :REM*198
725 DATA 25Ø,133,253,169,35,141,
    178,2,169,17,141,4,212,141,1
    89,2                        :REM*119
73Ø DATA 32,198,195,169,238,141,
    163,194,173,192,2,24Ø,3,76,2
    Ø8,194                      :REM*6
735 DATA 172,17Ø,2,174,171,2,136
    ,16,3,76,8Ø,194,173,9,2Ø8,2Ø
    8                           :REM*131
```

```
74Ø DATA 21,173,188,2,24Ø,3,76,6
     Ø,194,173,8,2Ø8,2Ø1,255,2Ø8,
     3                          :REM*4
745 DATA 76,169,194,76,8Ø,194,17
     3,19Ø,2,24Ø,8,2Ø6,19Ø,2,2Ø8,
     8                          :REM*219
75Ø DATA 76,6Ø,194,173,188,2,2Ø8
     ,3,76,63,194,173,9,2Ø8,2Ø1,1
     8Ø                         :REM*4
755 DATA 176,9Ø,2Ø1,15Ø,24Ø,118,
     2Ø1,97,2Ø8,117,173,191,2,2Ø8
     ,112,173                   :REM*95
76Ø DATA 8,2Ø8,2Ø1,236,176,11,17
     3,193,2,2Ø8,1ØØ,32,22Ø,195,7
     6,63                       :REM*238
765 DATA 194,2Ø1,254,176,5,2Ø5,1
     81,2,176,35,169,15,141,184,2
     ,173                       :REM*145
77Ø DATA 185,2,2Ø1,65,176,5,169,
     31,141,184,2,173,27,212,45,1
     84                         :REM*19
775 DATA 2,141,19Ø,2,238,19Ø,2,3
     2,131,195,76,54,194,169,1,13
     3                          :REM*148
78Ø DATA 253,169,252,141,8,2Ø8,3
     2,163,195,76,63,194,169,196,
     141,252                    :REM*253
785 DATA 7,169,32,141,29,2Ø8,169
     ,9,141,43,2Ø8,169,1,141,192,
     2                          :REM*46
79Ø DATA 141,194,2,32,131,195,32
     ,198,195,76,63,194,32,2Ø9,19
     5,2Ø6                      :REM*189
795 DATA 9,2Ø8,173,194,2,2Ø8,9,2
     38,178,2,173,178,2,141,1,212
                                :REM*218
8ØØ DATA 2Ø2,16,6,152,48,1Ø6,76,
     186,194,173,193,2,24Ø,7,173,
     9                          :REM*79
8Ø5 DATA 2Ø8,41,3,24Ø,85,165,253
     ,2Ø8,81,173,191,2,24Ø,5,173,
     192                        :REM*166
81Ø DATA 2,24Ø,68,173,8,2Ø8,2Ø1,
     26,176,8,169,238,141,163,194
     ,76                        :REM*81
815 DATA 163,194,2Ø1,255,2Ø8,29,
     173,192,2,2Ø8,19,173,9,2Ø8,2
     Ø1,6Ø                      :REM*17Ø
82Ø DATA 144,23,2Ø1,11Ø,176,19,3
     2,131,195,169,1,141,193,2,16
     9,2Ø6                      :REM*1Ø7
825 DATA 141,163,194,2Ø6,8,2Ø8,7
     6,186,194,32,2Ø9,195,32,22Ø,
     195,169                    :REM*234
83Ø DATA 1,141,191,2,141,188,2,3
     2,67,193,32,67,193,76,134,19
     3                          :REM*35
835 DATA 173,188,2,2Ø8,8,164,254
     ,177,251,41,16,2Ø8,74,76,12Ø
     ,193                       :REM*2Ø2
84Ø DATA 173,195,2,2Ø8,6,169,1,1
     41,186,2,96,169,17,141,176,2
                                :REM*145
845 DATA 165,254,2Ø8,3,238,176,2
     ,173,177,2,45,176,2,2Ø5,176,
     2                          :REM*32
85Ø DATA 24Ø,8,169,1,141,195,2,7
     6,128,193,169,Ø,141,189,2,16
     6                          :REM*2Ø1
855 DATA 254,2Ø8,7,232,134,254,2
     32,76,13,195,2Ø2,134,254,24,
     189,1                      :REM*224
86Ø DATA 2Ø8,1Ø5,5,141,9,2Ø8,96,
     169,2Ø6,141,71,195,169,238,1
     41,96                      :REM*2Ø3
865 DATA 195,173,9,2Ø8,141,185,2
     ,169,1,141,173,2,141,188,2,1
     73                         :REM*222
87Ø DATA 193,2,24Ø,3,76,6Ø,194,1
     6Ø,4,174,173,2,173,9,2Ø8,2Ø8
                                :REM*187
875 DATA 6,238,9,2Ø8,76,74,195,2
     38,9,2Ø8,173,8,2Ø8,2Ø1,255,2
     Ø8                         :REM*148
88Ø DATA 6,32,2Ø9,195,76,123,195
     ,238,8,2Ø8,32,67,193,2Ø2,2Ø8
     ,234                       :REM*73
885 DATA 2Ø6,173,2,136,2Ø8,211,2
     38,172,2,24Ø,16,169,238,141,
     71,195                     :REM*56
89Ø DATA 32,2Ø9,195,169,2Ø6,141,
     96,195,76,55,195,169,254,141
     ,172,2                     :REM*183
895 DATA 76,12Ø,193,169,2,141,1,
     212,169,185,141,5,212,169,99
     ,141                       :REM*86
9ØØ DATA 6,212,141,15,212,169,12
     9,141,4,212,141,18,212,169,1
     28,141                     :REM*2Ø9
9Ø5 DATA 4,212,96,169,Ø,141,6,21
     2,141,4,212,141,5,212,169,42
                                :REM*174
91Ø DATA 141,1,212,169,252,141,6
     ,212,169,17,141,4,212,169,16
     ,141                       :REM*1Ø9
915 DATA 4,212,141,194,2,96,169,
     2Ø6,141,63,194,169,238,141,7
     1,194                      :REM*7Ø
92Ø DATA 96,169,238,141,63,194,1
     69,2Ø6,141,71,194,96,169,194
     ,141,252                   :REM*173
925 DATA 7,169,Ø,141,43,2Ø8,169,
     48,141,29,2Ø8,96           :REM*148
```


Circle 214 on Reader Service card.

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. Ask for SPECIAL combo offer with DiskMaker™! MODULE subscription available.

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

SPECIALS

Disk notcher **$5.99**
Double your disk capacity with this little tool.

Generic Disks DS/DD ..... **79¢**

300 Baud Modem **$39.95**

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.

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

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**

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

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.

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**

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

1541 M.A.S.H.

Now you can service your own 1541 disk drive using 1541 M.A.S.H. Save big bucks on repair bills. Rate the performance of your drive. Test and adjust RPM's. Test and adjust head alignment. Step by step instructions that anyone can follow. Pays for itself the first time you use it to adjust a misbehaving drive. No knowledge of electronics is necessary. All you needs is a screwdriver and 20 minutes.

NOW ONLY $19.95

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

THE MECHANIC

A collection of Programmers utilities for the Commodore-64 enthusiasts. Included are Programs which will allow you to make your 64 do things it did not do before. Four major utilities are listed below but contains more!

- **FULL FEATURED TRACK AND SECTOR EDITOR** - Display can be changed to readout in ASCII, HEX or Decimal, also a directory can be listed within the Program!
- **FILE MAINTAINER** - A menu driven section featuring a scrolling file selector to copy multible files without typing all the names in. Also included is a file renamer, scratcher and file locker and unlocker.
- **ML MONITOR** - A complete monitor with easy to use commands along with some extra features not found on some. has the ability to do a directory within the monitor and send drive commands.
- **POWER SORT** - A unique sorting program that allows you to pull in the directory, sort it alphabetically or by size and then store it back on the disk!

$19.95

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.

MACRO 64/128

The first of its kind! New for the 128. A complete co-resisdent assembler package that allows rapid development when working with both the 128 and the 64. 128 mode takes advantage of the extra memory, 80 columns and the built in monitor. Package has several extended commands and includes a full featured editor and monitor.

- Everything co-resisdent for quick development.
- Assemble to memory or disk.
- Supports the use of two disk drives.
- Files generated by other assemblers can be easily transferred over.
- Macro's and conditional directives are fully supported.
- Over 64K available when used in the 128!

$39.95

D-CODER

- Translates any machine language program into easy-to-ready 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

POWER DRIVE

A cartridge based program that gives you the advantage of having several programs in memory at the same time. Up to 28K of programs or data can be stored. Package includes a 28K RAM drive, extended BASIC, DOS commands and a disk editor. Several uses can be thought of. Imagine writing a game and having a sprite editor in memory at the same time! Several utilites can be at your tap.

- 28K RAM drive that can store program files or data. All file commands such at GET#, INPUT# and PRINT# are supported. Has eight commands for the loading and saving the RAM drives memory.
- Extra 16 BASIC commands giving you all the important ones... Renumber, Auto, Trace, Delete and other goodies.
- Quick one button DOS command supported, such as a none destructive directory along with others.
- A complete disk editor that allows you to pull in a sector, modify it and then rewrite it.

$29.95

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

WAR GAMES AUTODIALER



1. **Auto Dial** will automatically dial a set of numbers you choose.
2. **Review Numbers** will review numbers that were answered by a computer.
3. **Save Numbers** will save numbers where a computer answered.
4. **Hardcopy of Numbers** will print out list of numbers where a computer answered.
5. **LOAD Numbers** will load in numbers to continue where it left off.
6. **Continue** will pick up dialing where it was interrupted.

$19.95

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

THE XXXXXXXXXX

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!

$24.95

Print Shop is a trademark of Broderbund.

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 • 24 hour BBS order line • 206-687-5205

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

TELEX 4949909/MEGAS

"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 365B5

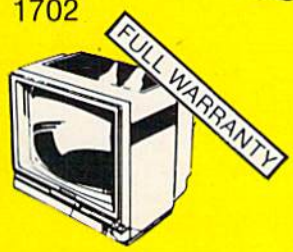
RUN

Circle 223 on Reader Service card.

COMMODORE

MONITORS

1702



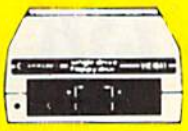
COMMODORE

$139.00

(RGB's Available)

DISK DRIVES

1541

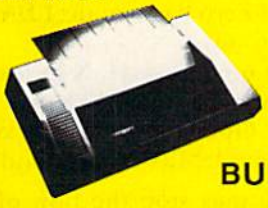


COMMODORE

$149.00

PRINTER

EPSON
WARRANTED



CR220

NOW $78.00

RETAIL $200.00

BUILT-IN INTERFACE

FREE TRIAL PERIOD

MODEMS POWER SUPPLY

For
The C-64



On Sale!



CALL for Special Pricing!

TUNERS

Turn your Monitor into a Color





$99

CABLE TV

CONVERTERS

VHF CONVERTERS
JERROLD, OAK,
SCIENTIFIC,
ATLANTA, ZENITH



CALL TODAY FOR PRICE!!

PRO-TECH-TRONICS

Formally **T & D Electronics** • 6870 Shingle Creek Parkway #103 • Minneapolis, MN 55430

—NEXT-DAY DELIVERY*—

CALL TODAY *IN STOCK ITEM

SCHOOL P.O.'s Accepted!

1-800-345-5080

Disk Reader

By PAOLO AGOSTINI

Here's a program that gives you the means to read whatever's on your disk, whether it's a sequential file, a machine language program or just a Basic program. And you can even print out that information.

Some Basic and machine language programs are extremely difficult to examine or decipher. There are various reasons for this. Some programs are loaded in memory sections where they overlap the machine code monitor; some are "hidden" in the RAM under ROM; some are copy-protected to prevent us from examining them.

Now, with Disk Reader, you can read data from almost any disk (the exceptions being those that are copy-protected). You may have the output printed to both the screen and the printer. Disk Reader has the following options.

1. The ability to read the disk directory without loading it into the computer's memory.
2. The ability to read any Basic program from disk, thus reconverting tokens into keywords.
3. The ability to read any machine code program, printing it in the form of addresses, hex numbers and assembly language opcodes—just as you'd see it with any ordinary machine language monitor.
4. The ability to read any sequential file from disk, skipping unprintable characters.

Due to the program's multipurpose tasks, the listing is long. Please pay careful attention when typing in Basic keywords (leave spaces where indicated) and assembly opcodes. Each opcode is accompanied by a so-called "opcode tag," which serves to specify the mode. These modes are explained below.

1. Opcode + an asterisk (*): Implied mode; for example, BRK, CLI, RTS, and so on.
2. Opcode + A: Absolute mode; JMP $C000, LDA $CA07, etc.
3. Opcode + B: Immediate mode; ORA #$40, LDA #$7F, etc.
4. Opcode + C: Zero Page mode; LDA $FB, AND $01, and so on.
5. Opcode + D: Absolute X-Indexed mode; STA $C010,X, etc.
6. Opcode + E: Absolute Y-Indexed mode; LDA $C010,Y, and so on.
7. Opcode + F: Indirect X-Indexed Zero Page mode; LDA ($FB,X), etc.
8. Opcode + G: Indirect Y-Indexed Zero Page mode; LDA ($FB),Y, and so on.
9. Opcode + H: X-Indexed Zero Page mode; LDA $40,X, etc.
10. Opcode + I: Y-Indexed Zero-Page mode; LDA $40,Y, and so on.

You may stop the flow of data at any time by pressing the S key, which stops the output and returns you to the main menu. Or, you may use the shift or Commodore key, which pauses the output for as long as it's pressed. (For especially long pauses, use the shift-lock key.)

To end the program, use option 5 of the main menu; should you use the run/stop key, the communication channels between the computer and disk drive (and eventually printer) will not be properly closed. R

Address all author correspondence to Paolo Agostini, Via Pascoli, 5/B, 35125 Padova, Italy.

Listing 1. *Disk Reader program.*

```
10Ø REM DISK READER          :REM*232
18Ø CLOSE4:CLOSE1:CLOSE15:OK=Ø:C
    LR                       :REM*56
19Ø PRINTCHR$(147):FORI=1TO1Ø:PR
    INTCHR$(17);CHR$(32);:NEXT
                             :REM*198
2ØØ PRINT"JUST A MOMENT PLEASE":
    GOSUB249Ø:T$=CHR$(147)+CHR$(
    13)+CHR$(13)             :REM*72
21Ø FORI=1TO13:T$=T$+CHR$(32):NE
    XT:FORI=1TO14:T$=T$+CHR$(45)
    :NEXT                    :REM*92
22Ø FORI=1TO12:T$=T$+CHR$(157):N
    EXT:T$=T$+"{CRSR DN}DISKREAD
    ER{CRSR DN}":FORI=1TO12
                             :REM*154
23Ø T$=T$+CHR$(157):NEXT:FORI=1T
    O14:T$=T$+CHR$(45):NEXT:T$=T
    $+CHR$(13)               :REM*234
24Ø GOSUB176Ø:IFDE<>5THENGOSUB12
    2Ø                       :REM*46
25Ø ONDEGOTO192Ø,13ØØ,31Ø,157Ø,2
    43Ø                      :REM*78
27Ø GET#1,A$:L=L+1:IFL=65535THEN
    L=Ø                      :REM*79
28Ø IFST<>ØTHEN228Ø          :REM*187
```

→

RUN It Right

C-64; C-128 (in C-64 mode)
Disk drive; printer optional

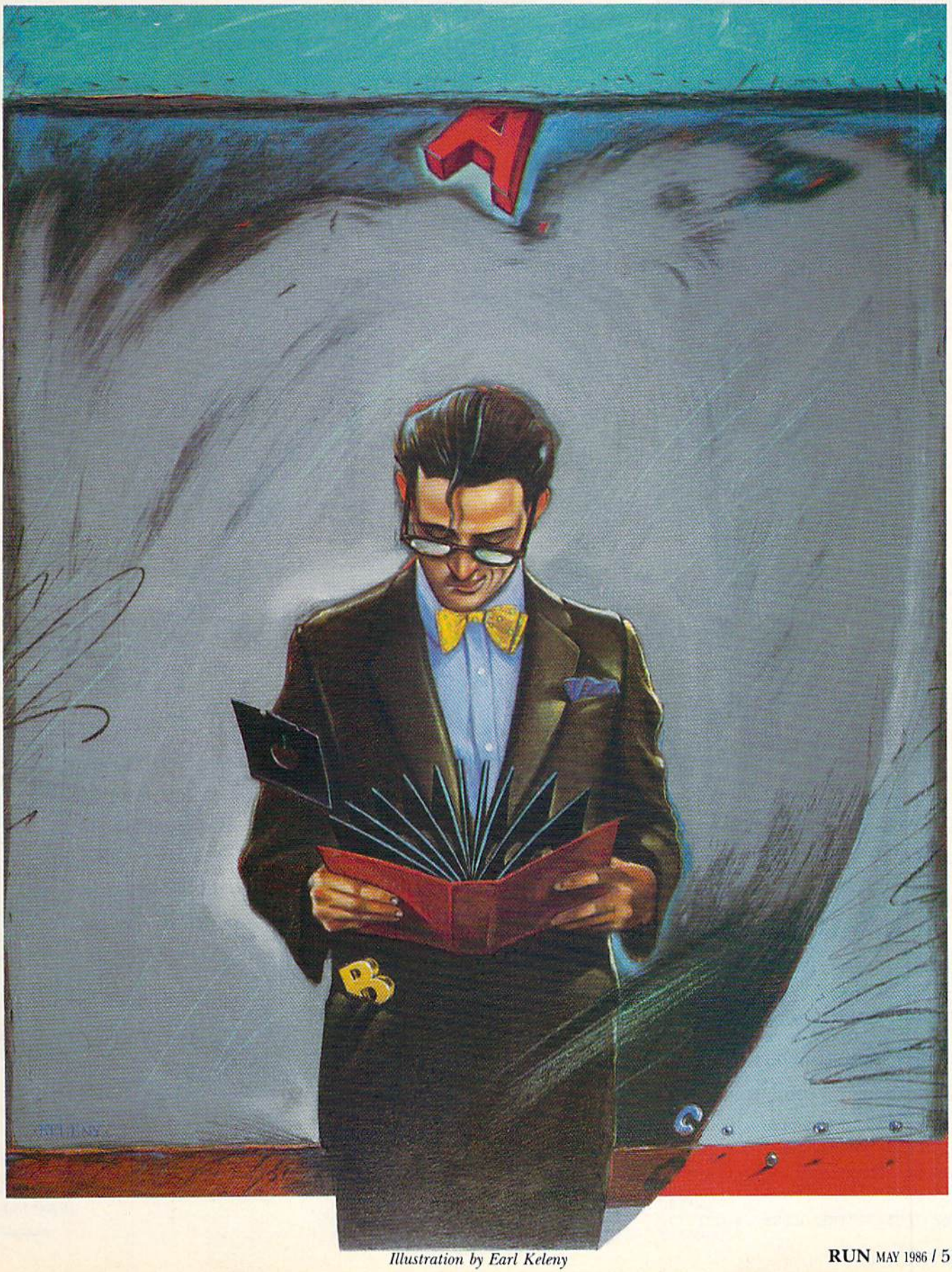


Illustration by Earl Keleny

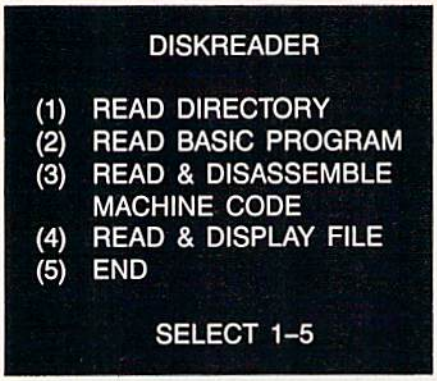


Photo 1. Diskreader program menu.

Listing 1 continued.

```
29Ø D=ASC(A$+CHR$(Ø)):RETURN
                          :REM*137
31Ø GOSUB234Ø:PRINTT$:PRINT:PRIN
    T                     :REM*2Ø7
32Ø IFOKTHENPRINT#4,NF$:PRINT#4:
    PRINT#4               :REM*185
33Ø PRINT" START ADDRESS:{3 SPAC
    Es}$";                :REM*173
34Ø IFOKTHENPRINT#4,"START ADDRE
    SS:{3 SPACEs}$";      :REM*115
35Ø GOSUB27Ø:L1=D:GOSUB27Ø:L2=D
                          :REM*73
36Ø L=L1+L2*256:D=L:GOSUB44Ø:PRI
    NTH$:PRINT:PRINT      :REM*89
37Ø IFOKTHENPRINT#4,H$:PRINT#4:P
    RINT#4                :REM*63
38Ø GOSUB27Ø:OP=D         :REM*189
39Ø GOSUB44Ø:A$=H$:GOSUB56Ø
                          :REM*149
4ØØ IFPEEK(653)THEN4ØØ   :REM*213
41Ø IFPEEK(197)=13THEN228Ø
                          :REM*247
42Ø GOTO38Ø               :REM*239
44Ø H$=""                 :REM*245
45Ø IFDTHENA=INT(D/16)    :REM*181
46Ø H$=MID$("Ø123456789ABCDEF",1
    +D-A*16,1)+H$         :REM*135
47Ø D=A:IFDGOTO45Ø        :REM*39
48Ø IFLEN(H$)<2THENH$=RIGHT$("ØØ
    "+H$,2)               :REM*25
49Ø IFLEN(H$)=3THENH$=RIGHT$("ØØ
    ØØ"+H$,4)             :REM*231
5ØØ RETURN                :REM*47
52Ø D=Ø:IFH$>""THENFORH=1TOLEN(H
    $)                    :REM*92
53Ø A=ASC(MID$(H$,H,1))-48
                          :REM*36
54Ø D=D*16+A+(A>9)*7:NEXT:RETURN
                          :REM*216
56Ø GOSUB64Ø              :REM*1ØØ
57Ø PRINTXX$:IFOKTHENPRINT#4,XX$
                          :REM*58
58Ø IFOT$="BRK"OROT$="RTS"THEN61
    Ø                     :REM*174
59Ø IFLEFT$(OT$,3)="JMP"THEN61Ø
                          :REM*228
6ØØ RETURN                :REM*148
61Ø PRINTDI$:IFOKTHENPRINT#4,DI$
                          :REM*68
62Ø RETURN                :REM*168
64Ø D=L-1:GOSUB44Ø:OX$=H$
                          :REM*158
65Ø IFLEN(OX$)<4THENOX$=RIGHT$("
    ØØØØ"+OX$,4)          :REM*26
66Ø OX$="."+OX$:XX$=OX$+CHR$(32)
    +A$+CHR$(32)          :REM*146
67Ø OT$=LEFT$(R$(OP),3)   :REM*14
68Ø U$=RIGHT$(R$(OP),1)   :REM*232
69Ø IFU$="*"THENGOSUB76Ø:RETURN
                          :REM*1ØØ
7ØØ IFU$="?"THENGOSUB76Ø:GOTO73Ø
                          :REM*21Ø
71Ø ONASC(U$)-64GOSUB78Ø,84Ø,89Ø
    ,91Ø,94Ø,97Ø,1Ø2Ø,1Ø7Ø,11ØØ,
    113Ø,119Ø             :REM*232
72Ø H1$="":H2$="":RETURN  :REM*8
73Ø IF(OP<32)OR(OP>127ANDOP<16Ø)
    OR(OP=34)THENRETURN   :REM*12Ø
74Ø XX$=XX$+CHR$(32)+CHR$(39)+CH
    R$(18)+CHR$(OP)+CHR$(146):RE
    TURN                  :REM*134
76Ø XX$=XX$+LEFT$(SP$,15)+OT$:RE
    TURN                  :REM*2
78Ø OT$=OT$+CHR$(32)+CHR$(36)
                          :REM*163
79Ø GOSUB27Ø:GOSUB44Ø:H1$=H$
                          :REM*123
8ØØ GOSUB27Ø:GOSUB44Ø:H2$=H$
                          :REM*165
81Ø XX$=XX$+H1$+CHR$(32)+H2$+LEF
    T$(SP$,1Ø)+OT$+H2$+H1$
                          :REM*75
82Ø RETURN                :REM*113
84Ø OT$=OT$+CHR$(32)+CHR$(35)+CH
    R$(36)                :REM*119
85Ø GOSUB27Ø:GOSUB44Ø:H1$=H$
                          :REM*183
86Ø XX$=XX$+H1$+LEFT$(SP$,13)+OT
    $+H1$                 :REM*243
87Ø RETURN                :REM*163
89Ø OT$=OT$+CHR$(32)+CHR$(36):GO
    TO85Ø                 :REM*1Ø9
91Ø OT$=OT$+CHR$(32)+CHR$(36):GO
    SUB79Ø                :REM*7
92Ø XX$=XX$+CHR$(44)+CHR$(88):RE
    TURN                  :REM*23
94Ø OT$=OT$+CHR$(32)+CHR$(36):GO
    SUB79Ø                :REM*37
95Ø XX$=XX$+CHR$(44)+CHR$(89):RE
    TURN                  :REM*61
97Ø OT$=OT$+CHR$(32)+CHR$(4Ø)+CH
    R$(36)                :REM*213
98Ø GOSUB85Ø              :REM*41
99Ø XX$=XX$+CHR$(44)+CHR$(88)+CH
    R$(41)                :REM*7
1ØØØ RETURN               :REM*37
1Ø2Ø OT$=OT$+CHR$(32)+CHR$(4Ø)+C
    HR$(36)               :REM*7
1Ø3Ø GOSUB85Ø             :REM*92
1Ø4Ø XX$=XX$+CHR$(41)+CHR$(44)+C
    HR$(89)               :REM*19Ø
1Ø5Ø RETURN               :REM*88
1Ø7Ø OT$=OT$+CHR$(32)+CHR$(36):G
    OSUB85Ø               :REM*36
1Ø8Ø XX$=XX$+CHR$(44)+CHR$(88):R
    ETURN                 :REM*184
11ØØ OT$=OT$+CHR$(32)+CHR$(36):G
    OSUB85Ø               :REM*66
111Ø XX$=XX$+CHR$(44)+CHR$(89):R
    ETURN                 :REM*222
113Ø OT$=OT$+CHR$(32)+CHR$(36)
                          :REM*2
114Ø GOSUB27Ø:OX=D:GOSUB44Ø:H1$=
    H$                    :REM*6
115Ø OX=OX+(OX>127)*256:D=OX+L:G
    OSUB44Ø:OX$=H$        :REM*94
116Ø XX$=XX$+H1$+LEFT$(SP$,13)+O
    T$+OX$                :REM*118
117Ø RETURN               :REM*2Ø8
119Ø OT$=OT$+CHR$(32)+CHR$(4Ø)+C
    HR$(36)               :REM*178
12ØØ GOSUB79Ø:XX$=XX$+CHR$(41):R
    ETURN                 :REM*2Ø8
122Ø PRINTT$:PRINT:PRINT:REM*12Ø
123Ø PRINT" OUTPUT TO SCREEN ";
                          :REM*28
124Ø PRINT"OR TO PRINTER (S/P)?"
    :PRINT                :REM*236
125Ø GETA$:IFA$<>"S"ANDA$<>"P"TH
    EN125Ø                :REM*12Ø
126Ø OK=Ø:IFA$="P"THENOK=1
                          :REM*198
127Ø IFA$="P"THENOPEN4,4:PRINT#4
                          :REM*98
128Ø RETURN               :REM*63
13ØØ GOSUB234Ø:PRINTT$:PRINT:PRI
    NT                    :REM*177
131Ø IFOKTHENPRINT#4,CHR$(14);NF
    $:PRINT#4:PRINT#4,CHR$(15)
                          :REM*95
132Ø PRINT" START ADDRESS:{3 SPA
    CEs}$";               :REM*143
133Ø GOSUB27Ø:L1=D:GOSUB27Ø:L2=D
                          :REM*33
134Ø L=L1+L2*256:D=L:GOSUB44Ø:PR
    INTH$:PRINT:PRINT     :REM*49
135Ø GOSUB27Ø:GOSUB27Ø    :REM*65
136Ø IFD=ØTHENPRINT:PRINT"E.O.F.
    ":GOTO228Ø            :REM*95
137Ø GOSUB27Ø:N1=D:GOSUB27Ø:N2=D
                          :REM*79
138Ø N=N1+N2*256:PRINTN;:IFOKTHE
    NPRINT#4,N;           :REM*65
139Ø GOSUB27Ø             :REM*181
14ØØ IFPEEK(653)THEN14ØØ:REM*219
141Ø IFPEEK(197)=13THEN228Ø
                          :REM*227
142Ø IFD=ØANDOKTHENPRINT#4
                          :REM*71
143Ø IFD=ØTHENPRINT:GOTO135Ø
                          :REM*217
144Ø IF(PEEK(212)<>ØORD<128)ANDO
    KTHENPRINT#4,CHR$(D);
                          :REM*123
145Ø IF(PEEK(212)<>ØORD<128)THEN
    PRINTCHR$(D);:GOTO147Ø
                          :REM*187
146Ø PRINTBA$(D-128);:IFOKTHENPR
    INT#4,BA$(D-128);     :REM*57
147Ø IFOKAND(D=58ORD=44)ANDPEEK(
    211)>65THEN152Ø       :REM*21
148Ø IFOK=ØAND(D=58ORD=44)ANDPEE
    K(211)>36THEN152Ø     :REM*85
149Ø IFOKANDPEEK(211)>75THEN152Ø
                          :REM*153
15ØØ IFOK=ØANDPEEK(211)>38THEN15
    2Ø                    :REM*59
151Ø GOTO139Ø             :REM*3
152Ø Z%=PEEK(212):PRINT:IFOKTHEN
    PRINT#4               :REM*73
153Ø TP$=LEFT$(SP$,LEN(STR$(N))+
    1):POKE212,Z%         :REM*85
154Ø PRINTTP$;:IFOKTHENPRINT#4,T
    P$;                   :REM*232
155Ø GOTO139Ø             :REM*44
157Ø GOSUB234Ø:PRINTT$:PRINT:PRI
    NT                    :REM*192
158Ø IFOKTHENPRINT#4,CHR$(14);NF
    $                     :REM*15Ø
159Ø IFOKTHENPRINT#4,CHR$(15):PR
    INT#4                 :REM*58
16ØØ IFOKTHENPRINT#4:CLOSE4:OK=Ø
                          :REM*22
161Ø IFOKTHENOPEN4,4,7    :REM*16Ø
162Ø NC%=Ø                :REM*98
163Ø GOSUB27Ø:IFOKTHENNC%=NC%+1
                          :REM*94
164Ø IFOKANDNC%>65THENNC%=Ø:PRIN
    T#4                   :REM*17Ø
165Ø IFPEEK(653)THEN165Ø  :REM*54
166Ø IFPEEK(197)=13THEN228Ø
                          :REM*222
167Ø IFOKANDD=34THENPRINT#4,CHR$
    (39);                 :REM*6Ø
168Ø IFD=34THENPRINTCHR$(39);:GO
    TO163Ø                :REM*198
169Ø IFOKANDD=13THENPRINT#4
                          :REM*156
17ØØ IFD=13THENPRINT:GOTO163Ø
                          :REM*128
171Ø IFOKAND((D>31ANDD<128)ORD>1
    59)THENPRINT#4,CHR$(D);
                          :REM*148
172Ø IF((D>31ANDD<128)ORD>159)TH
    ENPRINTCHR$(D);:GOTO163Ø
                          :REM*194
```

→

Sensational Prices!
. . . On Our Most Popular Items!

from microfal® . . .

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**

COMPUTERFACTS™ from SAMS

Technical Service Data for Your Computer and Peripherals



Sams introduces COMPUTERFACTS™ . . . packets of information that reveal the inner workings of major brand micros, monitors, printers and disk drives. Includes schematic wiring diagrams, parts lists, disassembly instructions, troubleshooting techniques, and other repair data.

33477 Commodore 64 Computer
33513 VIC-20 Computer
33551 Commodore Plus/4 Computer
33481 Commodore 1541 Disk Drive
33496 Commodore 1525 Printer
33508 Commodore C16 Computer
33546 Commodore 1701 Monitor
35950 Gemini 10X Printer
35964 Gemini 15X Printer

All packets $17.95 each

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 (R1R)
38464 C-128 Dust Cover and Catalog (R1R)

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**

G-Wiz 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 R1R

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 VISA

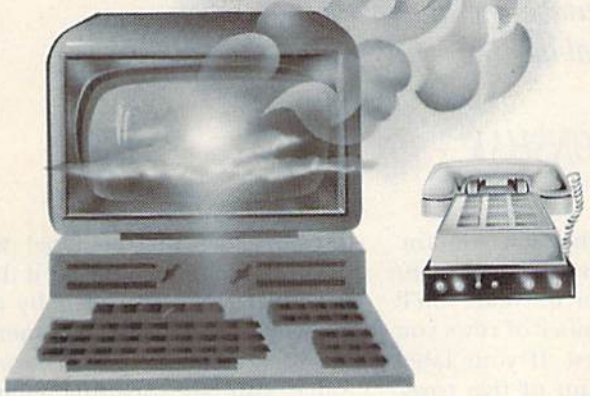
NO EXTRA FEE FOR CHARGES
WE VERIFY CHARGE CARD ADDRESSES.
ORDER TOLL FREE
1-800-348-2778

Listing 1 continued.

```
173Ø PRINTCHR$(32);:IFOKTHENPRIN
     T#4,CHR$(32);        :REM*194
174Ø GOTO163Ø             :REM*88
176Ø PRINTT$:PRINT:PRINT:REM*15Ø
177Ø PRINTTAB(3);"(1) READ DIREC
     TORY":PRINT          :REM*24Ø
178Ø PRINTTAB(3);"(2) READ BASIC
      PROGRAM":PRINT      :REM*56
179Ø PRINTTAB(3);"(3) READ & DIS
     ASSEMBLE MACHINE CODE":PRIN
     T                    :REM*19Ø
18ØØ PRINTTAB(3);"(4) READ & DIS
     PLAY FILE":PRINT     :REM*31
181Ø PRINTTAB(3);"(5) END "
                          :REM*113
182Ø PRINT:PRINT:PRINTTAB(13)"SE
     LECT 1-5{3 SPACEs}";:REM*45
183Ø FORI=1TO15:GETA$:PRINTCHR$(
     157);CHR$(191);      :REM*29
184Ø IFA$<>""THEN189Ø     :REM*55
185Ø NEXT:FORI=1TO15:GETA$
                          :REM*155
186Ø PRINTCHR$(157);CHR$(18);CHR
     $(191);CHR$(146);    :REM*31
187Ø IFA$<>""THEN189Ø     :REM*85
188Ø NEXT:GOTO183Ø        :REM*2Ø9
189Ø IFA$<"1"ORA$>"5"THEN183Ø
                          :REM*1Ø9
19ØØ DE=VAL(A$):RETURN    :REM*15
192Ø PRINTT$:PRINT:PRINT" DISK N
     AME:";               :REM*227
193Ø IFOKTHENPRINT#4,"DISK NAME:
     ";                   :REM*11
194Ø CLOSE1:CLOSE15:FL=Ø:L$="":B
     $=""                 :REM*29
195Ø OPEN1,8,Ø,"$":OPEN15,8,15
                          :REM*85
196Ø INPUT#15,E1,E1$      :REM*171
197Ø IFE1THENPRINT:PRINT" DISK E
     RROR: "E1;E1$:GOTO228Ø
                          :REM*211
198Ø FORI=1TO33:GET#1,A$:REM*1Ø9
199Ø L$=L$+A$:NEXT:CLOSE1:PRINTL
     $:PRINT:PRINT:IFOKTHENPRINT
     #4,L$:PRINT#4        :REM*77
2ØØØ PRINTCHR$(18);" BLOCKS{5 SP
     ACEs}FILE NAME{1Ø SPACEs}FI
     LE TYPE"             :REM*229
2Ø1Ø IFOKTHENPRINT#4,"BLOCKS{3 S
     PACEs}FILE NAME{6 SPACEs}FI
     LE TYPE":PRINT#4     :REM*79
2Ø2Ø IFOKTHENPRINT#4,DI$:PRINT#4
                          :REM*61
2Ø3Ø OPEN1,8,Ø,"$"         :REM*253
2Ø4Ø GET#1,A$:GET#1,A$:GOSUB212Ø
                          :REM*141
2Ø5Ø GOSUB212Ø:IFFL=1THENCLOSE1:
     CLOSE15:GOTO228Ø     :REM*252
2Ø6Ø PRINTRIGHT$(SP$+STR$(L),4);
     LEFT$(SP$,5);        :REM*162
2Ø7Ø IFOKTHENPRINT#4,RIGHT$(SP$+
     STR$(L),4);LEFT$(SP$,5);
                          :REM*34
2Ø8Ø PRINTLEFT$(B$+SP$,23);FT$
                          :REM*212
2Ø9Ø IFOKTHENPRINT#4,LEFT$(B$+SP
     $,18);FT$            :REM*162
21ØØ GOTO2Ø5Ø             :REM*17Ø
212Ø B$="":GET#1,A$:GET#1,A$
                          :REM*24
213Ø GET#1,A$:L=ASC(A$+CHR$(Ø))
                          :REM*134
214Ø GET#1,A$:L=L+ASC(A$+CHR$(Ø)
     )*256                :REM*68
215Ø GET#1,A$:INPUT#15,E1,E1$:IF
     E1THENPRINT:PRINT" DISK ERR
     OR: "E1;E1$:GOTO228Ø :REM*4
216Ø IFA$=""THENFL=1:RETURN
                          :REM*222
217Ø IFA$<>CHR$(34)THEN215Ø
                          :REM*64
218Ø GET#1,A$             :REM*4Ø
219Ø IFPEEK(653)THEN219Ø:REM*112
22ØØ IFA$=CHR$(34)THEN222Ø:REM*2
221Ø B$=B$+A$:GOTO218Ø    :REM*216
222Ø GET#1,A$:IFA$=CHR$(32)THEN2
     22Ø                  :REM*188
223Ø FT$=A$               :REM*116
224Ø GET#1,A$:FT$=FT$+A$:GET#1,A
     $:FT$=FT$+A$         :REM*248
225Ø GET#1,A$:IFA$<>""THEN225Ø
                          :REM*118
226Ø RETURN               :REM*22
228Ø IFOKTHENPRINT#4      :REM*128
229Ø CLOSE1:CLOSE4:CLOSE15:OK=Ø
                          :REM*18Ø
23ØØ PRINT"{CRSR DN}":PRINTLEFT$
     (SP$,13);CHR$(18);"HIT ANY
     KEY"                 :REM*1ØØ
231Ø POKE198,Ø:WAIT198,1:POKE198
     ,Ø                   :REM*129
232Ø GOTO24Ø              :REM*27
234Ø PRINTT$:PRINT:PRINT:REM*221
235Ø INPUT" NAME OF FILE : ";NF$
     :PRINT               :REM*9
236Ø INPUT" FILE TYPE (PRG/SEQ/U
     SR) : ";TF$:PRINT"{CRSR DN}
      LOOKING FOR: ";NF$;",";TF$
                          :REM*187
237Ø OPEN15,8,15,"IØ"     :REM*2Ø9
238Ø OPEN1,8,5,"Ø:"+NF$+","+LEFT
     $(TF$,1)+",R"        :REM*65
239Ø INPUT#15,E1,E1$,E2,E3
                          :REM*19
24ØØ IFE1THENPRINT:PRINT" DISK E
     RROR: "E1;E1$:GOTO228Ø
                          :REM*131
241Ø RETURN               :REM*173
243Ø IFOKTHENPRINT#4      :REM*23
244Ø CLOSE4:CLOSE1:CLOSE15:OK=Ø
                          :REM*161
245Ø PRINTT$:FORI=1TO1Ø:PRINTCHR
     $(17);CHR$(29);:NEXT
                          :REM*233
246Ø PRINT" END OF PROGRAM !!{3
     CRSR DNs}"           :REM*131
247Ø END                  :REM*177
249Ø DIMBA$(76):FORI=ØTO75
                          :REM*147
25ØØ READBA$(I):NEXT      :REM*235
251Ø DATA"END ","FOR ","NEXT "
                          :REM*193
252Ø DATA"DATA ","INPUT#","INPUT
      ","DIM "," READ ","LET "
                          :REM*69
253Ø DATA"GOTO ","RUN","IF ","RE
     STORE ","GOSUB ","RETURN"
                          :REM*151
254Ø DATA"REM","STOP","ON ","WAI
     T ","LOAD ","SAVE ":REM*131
255Ø DATA"VERIFY ","DEF ","POKE
     ","PRINT#","PRINT","CONT"
                          :REM*177
256Ø DATA"LIST","CLR","CMD ","SY
     S ","OPEN ","CLOSE ","GET "
                          :REM*1Ø2
257Ø DATA"NEW","TAB("," TO ","FN
      ","SPC("," THEN "   :REM*15Ø
258Ø DATA"NOT"," STEP "," + ","
     - "," * "," / "," {UP ARROW
     } "," AND "," OR "   :REM*154
259Ø DATA"> ","=","<","SGN"," IN
     T"," ABS","USR","FRE"
                          :REM*82
26ØØ DATA"POS","SQR","RND","LOG"
     ,"EXP","COS","SIN"   :REM*98
261Ø DATA"TAN","ATN","PEEK","LEN
     ","STR$","VAL"       :REM*228
262Ø DATA"ASC","CHR$","LEFT$","R
     IGHT$","MID$","GO"   :REM*222
263Ø DATA***              :REM*152
264Ø READBA$:IFBA$<>"***"THENPRI
     NT"ERROR IN BASIC DATA":STO
     P                    :REM*142
266Ø DATABRK*,ORAF,?,?,?,ORAC,AS
     LC,?                 :REM*38
267Ø DATAPHP*,ORAB,ASL*,?,?,ORAA
     ,ASLA,?              :REM*98
268Ø DATABPLJ,ORAG,?,?,?,ORAH,AS
     LH,?                 :REM*18Ø
269Ø DATACLC*,ORAE,?,?,?,ORAD,AS
     LD,?                 :REM*42
27ØØ DATAJSRA,ANDF,?,?,BITC,ANDC
     ,ROLC,?              :REM*174
271Ø DATAPLP*,ANDB,ROL*,?,BITA,A
     NDA,ROLA,?           :REM*226
272Ø DATABMIJ,ANDG,?,?,?,ANDH,RO
     LH,?                 :REM*246
273Ø DATASEC*,ANDE,?,?,?,ANDD,RO
     LD,?                 :REM*14
274Ø DATARTI*,EORF,?,?,?,EORC,LS
     RC,?                 :REM*2Ø4
275Ø DATAPHA*,EORB,LSR*,?,JMPA,E
     ORA,LSRA,?           :REM*1Ø8
276Ø DATABVCJ,EORG,?,?,?,EORH,LS
     RH,?                 :REM*56
277Ø DATACLI*,EORE,?,?,?,EORD,LS
     RD,?                 :REM*5Ø
278Ø DATARTS*,ADCF,?,?,?,ADCC,RO
     RC,?                 :REM*42
279Ø DATAPLA*,ADCB,ROR*,?,JMPK,A
     DCA,RORA,?           :REM*22
28ØØ DATABVSJ,ADCG,?,?,?,ADCH,RO
     RH,?                 :REM*88
281Ø DATASEI*,ADCE,?,?,?,ADCD,RO
     RD,?                 :REM*96
282Ø DATA?,STAF,?,?,STYC,STAC,ST
     XC,?                 :REM*13
283Ø DATADEY*,?,TXA*,?,STYA,STAA
     ,STXA,?              :REM*167
284Ø DATABCCJ,STAG,?,?,STYH,STAH
     ,STXI,?              :REM*37
285Ø DATATYA*,STAE,TXS*,?,?,STAD
     ,?,?                 :REM*233
286Ø DATALDYB,LDAF,LDXB,?,LDYC,L
     DAC,LDXC,?           :REM*231
287Ø DATATAY*,LDAB,TAX*,?,LDYA,L
     DAA,LDXA,?           :REM*219
288Ø DATABCSJ,LDAG,?,?,LDYH,LDAH
     ,LDXI,?              :REM*215
289Ø DATACLV*,LDAE,TSX*,?,LDYD,L
     DAD,LDXE,?           :REM*11
29ØØ DATACPYB,CMPF,?,?,CPYC,CMPC
     ,DECC,?              :REM*127
291Ø DATAINY*,CMPB,DEX*,?,CPYA,C
     MPA,DECA,?           :REM*167
292Ø DATABNEJ,CMPG,?,?,?,CMPH,DE
     CH,?                 :REM*185
293Ø DATACLD*,CMPE,?,?,?,CMPD,DE
     CD,?                 :REM*83
294Ø DATACPXB,SBCF,?,?,CPXC,SBCC
     ,INCC,?              :REM*113
295Ø DATAINX*,SBCB,NOP*,?,CPXA,S
     BCA,INCA,?           :REM*71
296Ø DATABEQJ,SBCG,?,?,?,SBCI,IN
     CI,?                 :REM*39
297Ø DATASED*,SBCE,?,?,?,SBCD,IN
     CD,?                 :REM*151
298Ø DATA*                :REM*15
299Ø DIMR$(255),RT$(255):REM*2Ø7
3ØØØ FORT=ØTO255:READR$(T):NEXTT
                          :REM*2Ø5
3Ø1Ø READR$:IFR$<>"*"THENPRINT"E
     RROR IN OPCODE DATA":END
                          :REM*27
3Ø2Ø SP$="":DI$="":FORI=1TO39
                          :REM*95
3Ø3Ø SP$=SP$+CHR$(32):DI$=DI$+CH
     R$(45):NEXT          :REM*217
3Ø4Ø RETURN               :REM*37
```

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	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. You'll receive FREE OF CHARGE—3 hours of non-prime time use—a $15.00 value.

So why not Sign-Up today with this special offer, let GEnie bring a little magic into your life!

3 FREE Hours When You Sign Up From Your Keyboard Before May 31st— 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 **5JM11967,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.

Label Maker

With this handy program, you can combine expanded print, line centering, automatic numbering and graphics symbols to create professional-looking labels.

By MIKE KONSHAK

With the Label Maker program, you can create a label, then generate as many copies of it as you desire. Printing uniform labels gives your disk collection, personal possessions, and so on, a more professional appearance. And, if you use name tags at club functions, it's nice for them to be identical. You could also serialize your disk labels to keep track of program revisions and the like.

Label Maker was designed to print on one-up labels. If you have two-up labels, you can simply flip the label sheet over. If you ever need an enormous label, the program is capable of designing labels that use up to 66 rows and that are 70 characters wide.

That is the same size as a full piece of paper, but I would not recommend this as a one-page word processor; it would be too difficult to edit the lines.

Labels are generally separated by one line, or vertical space. Standard-size labels, which are most commonly available, are 15/16 of an inch wide by three to five inches long, and can hold five printed lines. Labels that are 3½ inches long are the most universal, because they can print 34 characters on one line, which is the normal number for the length of an address.

When designing your labels, you'll be asked to enter the number that's one greater than the maximum number of rows your label can contain. For example, if your label can print five lines, then enter 6. Next, you'll be asked for the number of rows you actually want printed. If your label can print a maximum of five rows, you should enter a number from 1 to 5; if 8, then 1 to 8.

Lastly, you'll be asked for the possible number of characters per row. This normally defaults to 34, for labels that are 3½ inches long. If you have labels of a different length, or if you've put your printer into Compressed mode or pitch, then you should adjust the desired number of characters per row accordingly.

You may save your labels on disk for recalling at a later date. Each label design is saved in individual sequential files. The filenames are preceded by a special code, LM] , which lessens the confusion if there are other sequential files on the same disk. Filenames cannot exceed 12 characters, since the code takes up four characters.

Besides printing text in standard pitch and in upper- and lowercase letters, Label Maker provides three special modes. Only one of these capabilities may be used in each line or row.

1. *Enhanced or Double Wide Print.* Most printers, including those by Commodore, have this capability. A line, or row, on the label will be printed in enhanced print if the data for the row is preceded by an up-arrow symbol (↑)—the exponent symbol to the left of your restore key. Since you are printing characters that are twice as wide, you can only use one-half the number of characters per line. A data line would look like this:

```
1 ? ↑Club Disk Library
```

2. *Centering of Text.* Text will be centered on the label if the data is preceded by a left-arrow symbol (←)—the key in the upper left-hand corner of your keyboard, just above the control key. To activate centering, a data line would look like this:

```
2 ? >Property of the Computer Club
```

3. *Serializing, or Auto-Numbering.* A serial number may be printed at the end of a line by adding the number sign (#) at the end of the data for that row. Numbering must start at any integer greater than zero. A data line that will print a serial number looks like the following:

```
3 ? 12/85 Library I.D. Number#
```

Since the Basic Input statement is used for data entry, you may not use commas, colons, semicolons or quotation marks in your lines of data. If you exceed 70 characters, you may experience input problems, because

RUN It Right

C-64; C-128 (in C-64 mode)
Disk drive; 1525 printer

Circle 105 on Reader Service card.

RAVE REVIEWS

RUN Magazine says,

". . . rugged design . . . ease of use . . . make it everyone's favorite . . ."

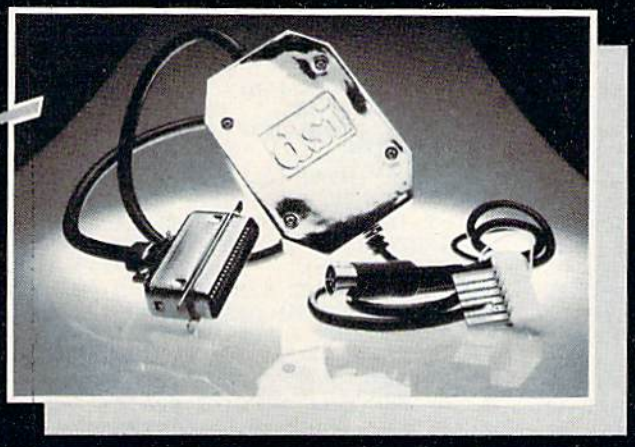
". . . outstanding 1525 emulation cannot be overemphasized."

" . . . 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

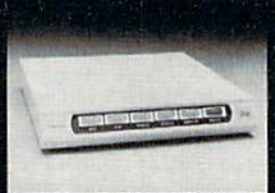
Smith Corona Fast Text 80
Smith Corona DP series
Smith Corona 200*
Smith Corona 300*
Smith Corona 400*
Royal 600*
Royal 610*
Riteman
Radix

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.



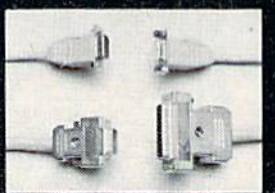
DATA SWITCH
Six DATA SWITCH models allow port expansion and sharing of computer and peripherals.



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.

the C-64 screen editor only accepts two lines when using input.

If you wish to replace a line of data with a blank line, then you must enter some single character (such as >) as the first character, then use the space bar to erase the remaining characters. Once you have saved and reloaded the label, the character you initially used for this deletion process will not appear when printing.

Once you've designed a label (be sure to save it) and have chosen to start printing it, you'll see the label on the screen. Double-width lines will be shown reversed; the text will be centered as it will appear; and if you've chosen serializing, a dummy serial number will be displayed to remind you that you've done so.

If you decide that that is not the label you had intended to print, enter a 0, or just press the return key without any entry, to exit the routine. The prompts in Label Maker are self-explanatory, so you shouldn't experience any problems.

If you run this program on the C-128, you must put it in C-64 mode or set up a 40-column window. Otherwise, the Data Input routine will not work correctly. R

Address all author correspondence to Mike Konshak, 4821 Harvest Court, Colorado Springs, CO 80917.

Listing 1. *Label Maker program.*

```
5 REM LABEL MAKER 1.2 PROGRAM (C
  )1985 BY MIKE KONSHAK  :REM*75
1Ø OPEN4,4,7:PRINTCHR$(14)
                         :REM*2Ø6
15 POKE53281,Ø:POKE5328Ø,Ø:PRINT
  "{SHFT CLR}{CTRL 8}"   :REM*23
2Ø RW=6:PR=5:NC=34:CR$=CHR$(13):
  B$=CHR$(32):FORI=1TO8Ø:S$=S$+
  B$:NEXTI               :REM*114
25 DIM PR$(66)           :REM*13
3Ø PRINT"{SHFT CLR} {CTRL 9} {SH
  FT L}ABEL {SHFT M}AKER (C)198
  5 BY {SHFT M}IKE {SHFT K}ONSH
  AK {CTRL Ø}"           :REM*182
35 PRINT"{CRSR DN} {SHFT T}HIS P
  ROGRAM WILL PRINT LABELS OUT
  ON"                    :REM*249
4Ø PRINT" YOUR PRINTER. {SHFT A}
  FTER DEFINING THE LABEL"
                         :REM*11Ø
45 PRINT" YOU WILL BE ABLE TO RU
  N AS MANY COPIES"      :REM*2Ø5
5Ø PRINT" OF THE LABEL AS YOU DE
  SIRE."                 :REM*236
55 PRINT"{CRSR DN} {SHFT P}OSSIB
  LE {SHFT U}SES:"       :REM*81
6Ø PRINTTAB(5)"{CRSR DN}{SHFT R}
  ETURN {SHFT A}DDRESS {SHFT L}
  ABELS"                 :REM*128
65 PRINTTAB(5)"{SHFT F}LOPPY {SH
  FT D}ISK {SHFT L}ABELS"
                         :REM*133
7Ø PRINTTAB(5)"{SHFT I}NVENTORY
  {SHFT I}{SHFT D} {SHFT L}ABEL
  S"                     :REM*12
75 PRINTTAB(5)"{SHFT S}WEEPSTAKE
  S {SHFT E}NTRIES"      :REM*159
8Ø PRINTTAB(5)"{SHFT H}I, {SHFT
  I}'M...{2 SPACEs}{SHFT N}AME
  {SHFT T}AGS"           :REM*3Ø
85 PRINT"{CRSR DN} {SHFT E}NHANC
  ED PRINT, {SHFT C}ENTERING AN
  D {SHFT S}ERIAL"       :REM*15
9Ø PRINT" {SHFT N}UMBERS MAY BE
  FORMATTED FO AN"       :REM*28
95 PRINT" INDIVIDUAL LINE.{CRSR
  DN} {SHFT P}RESS {CTRL 9}{SHF
  T A}NY {SHFT K}EY{CTRL Ø}":GO
  SUB1Ø5:GOTO375         :REM*63
1Ø5 GETA$:IFA$=""THEN1Ø5:REM*111
11Ø RETURN               :REM*168
12Ø PRINT"{SHFT CLR} {CTRL 9}{7
  SPACEs}{SHFT D}ESIGN {SHFT Y
  }OUR {SHFT O}WN {SHFT L}ABEL
  S{8 SPACEs}{CTRL Ø}":REM*254
125 PRINT"{CRSR DN} {SHFT P}OSSI
  BLE #{SHFT R}{SHFT O}{SHFT W
  }{SHFT S} PER {SHFT L}ABEL +
   1?";RW                :REM*2Ø1
13Ø PRINT"{CRSR UP}"TAB(29);:INP
  UTRW                   :REM*28
135 PRINT" #{SHFT R}{SHFT O}{SHF
  T W}{SHFT S} TO BE {SHFT P}R
  INTED ON {SHFT L}ABEL?";PR
                         :REM*161
14Ø PRINT"{CRSR UP}"TAB(29);:INP
  UTPR                   :REM*164
145 PRINT" {SHFT P}OSSIBLE #{SHF
  T C}{SHFT H}{SHFT A}{SHFT R}
  {SHFT A}{SHFT C}{SHFT T}{SHF
  T E}{SHFT R}{SHFT S} PER {SH
  FT R}OW?";NC           :REM*217
15Ø PRINT"{CRSR UP}"TAB(29);:INP
  UTNC                   :REM*17Ø
155 PRINT"{HOME}{CRSR DN} {SHFT
  E}NTER {SHFT D}{SHFT A}{SHFT
   T}{SHFT A} FOR {SHFT E}ACH
  {SHFT R}OW AS {SHFT P}ROMPTE
  D{3 SPACEs}"           :REM*129
16Ø PRINT" {SHFT S}ET {SHFT S}PE
  CIAL {SHFT M}ODES BY {SHFT M
  }AKING THE {SHFT F}IRST "
                         :REM*6
165 PRINT" {SHFT C}HARACTER ONE
  OF THE FOLLOWING:{7 SPACEs}"
                         :REM*93
17Ø PRINT"{5 SPACEs}{CTRL 9} {UP
   ARROW} {CTRL Ø} {SHFT E}NHA
  NCED, {SHFT D}OUBLE {SHFT W}
  IDE{5 SPACEs}"         :REM*88
175 PRINT"{5 SPACEs}{CTRL 9} {LE
  FT ARROW} {CTRL Ø} {SHFT C}E
  NTERED IN ROW"         :REM*237
18Ø PRINT" {SHFT I}F THE LABELS
  ARE TO BE {SHFT S}{SHFT E}{S
  HFT R}{SHFT I}{SHFT A}{SHFT
  L}{SHFT I}{SHFT Z}{SHFT E}{S
  HFT D},"               :REM*92
185 PRINT" ENTER THE '{SHFT P}OU
  ND {SHFT S}IGN' AS THE {SHFT
   L}{SHFT A}{SHFT S}{SHFT T}"
                         :REM*75
19Ø PRINT" CHARACTER IN THE ROW.
   {SHFT T}HE NUMBER WILL"
                         :REM*64
195 PRINT" BE PRINTED AT THE END
   OF THE ROW."          :REM*229
2ØØ PRINT"{5 SPACEs}{CTRL 9} # {
  CTRL Ø} {SHFT S}ERIALIZED {S
  HFT L}ABELS"           :REM*48
2Ø5 PRINT" {CTRL 9}{SHFT N}{SHFT
   O}{SHFT T}{SHFT E}: {SHFT O
  }NLY {SHFT O}{SHFT N}{SHFT E
  } {SHFT M}ODE {SHFT A}LLOWED
   PER {SHFT L}INE!!"    :REM*97
21Ø PRINT:FORI=1TOPR       :REM*3Ø
215 PRINTI;TAB(5)PR$(I):IFLEN(PR
  $(I))>34THENPRINT"{2 CRSR UP
  s}"TAB(3);:GOTO218     :REM*51
217 PRINT"{CRSR UP}"TAB(3);
                         :REM*2Ø9
218 INPUTPR$(I)          :REM*244
22Ø NEXTI:FL=1:CK=1       :REM*1Ø6
225 PRINT"{CRSR DN} {CTRL 9}{SHF
  T R}{CTRL Ø}EVISE {SHFT L}AB
  EL {CTRL 9}{SHFT S}{CTRL Ø}A
  VE {CTRL 9}{SHFT P}{CTRL Ø}R
  INT {CTRL 9}{SHFT E}{CTRL Ø}
  XIT"                   :REM*151
23Ø GOSUB1Ø5:IFA$="R"ORA$="{SHFT
   R}"THEN12Ø            :REM*148
235 IFA$="P"ORA$="{SHFT P}"THEN2
  6Ø                     :REM*51
24Ø IFA$="S"ORA$="{SHFT S}"THENG
  OSUB455:GOTO26Ø        :REM*Ø
245 IFA$="E"ORA$="{SHFT E}"THEN3
  75                     :REM*35
25Ø GOTO23Ø              :REM*236
26Ø PRINT"{SHFT CLR} {CTRL 9}{11
   SPACEs}{SHFT P}RINT {SHFT L
  }ABELS{13 SPACEs}{CTRL Ø}"
                         :REM*1Ø3
265 NM=Ø:FORI=1TOPR:     :REM*166
27Ø PRINT"{CRSR DN} {CTRL 9}{SHF
  T L}ABEL:{CTRL Ø} "NF$:PRINT
  "{CRSR DN}":FORI=1TOPR
                         :REM*37
275 IFLEFT$(PR$(I),1)="{UP ARROW
  }"THENPRINT"{CTRL 9}"MID$(PR
  $(I),2,INT(NC/2)):GOTO295
                         :REM*2Ø6
28Ø IFLEFT$(PR$(I),1)="{LEFT ARR
  OW}"THEN3ØØ            :REM*93
285 IFRIGHT$(PR$(I),1)="#"THENPR
  INTPR$(I)"9999":NM=1:GOTO295
                         :REM*236
29Ø PRINTLEFT$(PR$(I),NC):REM*87
295 NEXTI:GOTO3Ø5        :REM*1Ø8
3ØØ PRINTLEFT$(S$,(NC-LEN(PR$(I)
  ))/2)MID$(PR$(I),2,NC):GOTO2
  95                     :REM*2Ø5
3Ø5 PRINT"{4 CRSR DNs} {SHFT H}O
  W {SHFT M}ANY {SHFT L}ABELS
  [Ø TO {SHFT E}{SHFT X}{SHFT
  I}{SHFT T}]";:INPUTN:IFN=ØTH
  EN375                  :REM*218
31Ø IFNM=1THENPRINT"{CRSR DN} {S
  HFT S}TARTING {SHFT A}T {SHF
  T L}ABEL {SHFT N}UMBER ? 1{3
   CRSR LFs}";:INPUTNM:IFNM=ØT
  HEN375                 :REM*183
32Ø PRINT:FORI=1TON:PRINT" {SHFT
   P}{SHFT R}{SHFT I}{SHFT N}{
  SHFT T}{SHFT I}{SHFT N}{SHFT
   G}"I"{CRSR UP}":FORJ=1TOPR
                         :REM*165
325 IFLEFT$(PR$(J),1)="{UP ARROW
  }"THEN35Ø              :REM*218
33Ø IFLEFT$(PR$(J),1)="{LEFT ARR
  OW}"THEN365            :REM*145
335 IFRIGHT$(PR$(J),1)="#"THENPR
  INT#4,PR$(J)STR$(I+NM-1):GOT
  O355                   :REM*2
34Ø PRINT#4,LEFT$(PR$(J),NC):GOT
  O355                   :REM*153
35Ø PRINT#4,CHR$(14)MID$(PR$(J),
  2,INT(NC/2))CHR$(15) :REM*15
355 NEXTJ:FORK=1TORW-PR:PRINT#4,
  " ":NEXTK              :REM*218
36Ø NEXTI:GOTO375        :REM*49
365 PRINT#4,LEFT$(S$,(NC-LEN(PR$
  (J)))/2)MID$(PR$(J),2,NC):GO
  TO355                  :REM*228
375 PRINT"{SHFT CLR} {CTRL 9}{13
   SPACEs}{SHFT O}PTION {SHFT
  M}ENU{13 SPACEs}{CTRL Ø}"
                         :REM*18
```

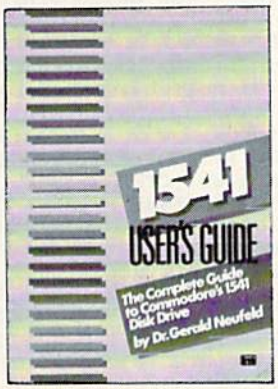
Circle 14 on Reader Service card.

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.



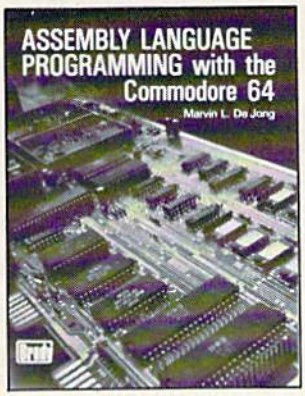
1. Teaches you about using the DOS, disk formatting and organization, direct-access programming, DOS protection recovering "damaged" data, and includes an overview of DOS 2.6. Also includes disk RAM map, math conversion routines, and a disassembled and annotated DOS. $19.95



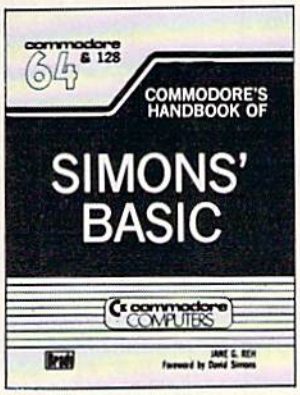
2. Clarifies confusing areas and corrects omissions in the equipment's user's manual. You'll learn how to validate, initialize, reuse disks, and more. Also includes a mailing list application listing for demonstration as well as some of the best utility programs. $19.95



3. A revision of the bestselling classic 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 128 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-AR(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

Circle 213 on Reader Service card.

CARNIVAL HOUSE

Special 64 & VIC 20
Arcade Games
$215 worth of software
for only $59.95!

Commodore Disks Only



Price Was
Repton $39.95

Will Star Fighter Armageddon arrive in time to save Repton? It's up to you.



Price Was
Turmoil $34.95

Fast action. Quality graphics. Shoot 'em up at its best.



Price Was
Gruds in Space $39.95

Your planet needs you! A rare fuel must be delivered to a stranded ship on Pluto.



Price Was
Squish 'Em $39.95

How far would you go for a suitcase full of money? Would you climb a 48 story building?



Price Was
Fast Eddie $34.95

You've got to be cool, you've got to be steady to play Fast Eddie.



Price Was
Wayout $39.95

You find the Way Out of 25 mazes—all in 3-d.

VIC-20 Games are cartridges only and include the titles: **Deadly Duck, Capture the Flag, Turmoil, Squish 'Em, Bandits** and **Fast Eddie.** (Some of the best ever produced for the VIC.)

This deal is too good to pass up, so hurry—supplies are limited.

All 6 Arcade Games for only **$59.95** plus $2.50 shipping and handling.

Games not sold separately.

Check, Mastercard and VISA accepted.

CARNIVAL HOUSE
145 Grove Street
Peterborough, NH 03458
(603) 924-9882

Label Maker

This program will print out labels on your printer. After defining the label, you will be able to run as many copies as you desire.

Possible uses:

- Return Address Labels
- Floppy Disk Labels
- Sweepstakes Entries
- Hi, I'm. . . Name Tags

Enhanced print, centering and serial numbers may be formatted to an individual line.

Press any key

Listing 1 continued.

```
38Ø PRINT"{CRSR DN}{8 SPACEs}{CT
    RL 9}{SHFT D}{CTRL Ø}ESIGN {
    SHFT L}ABEL"          :REM*221
385 PRINT"{CRSR DN}{8 SPACEs}{CT
    RL 9}{SHFT L}{CTRL Ø}OAD {SH
    FT L}ABEL {SHFT F}ROM {SHFT
    D}ISK"                :REM*74
39Ø IFFL<>ØTHEN PRINT"{CRSR DN}{
    8 SPACEs}{CTRL 9}{SHFT S}{CT
    RL Ø}AVE {SHFT L}ABEL TO {SH
    FT D}ISK"             :REM*37
395 IFFL<>ØTHEN PRINT"{CRSR DN}{
    8 SPACEs}{CTRL 9}{SHFT P}{CT
    RL Ø}RINT {SHFT L}ABELS"
                          :REM*122
4ØØ PRINT"{CRSR DN}{8 SPACEs}{CT
    RL 9}${CTRL Ø} {SHFT D}IRECT
    ORY"                  :REM*25
4Ø5 PRINT"{CRSR DN}{8 SPACEs}{CT
    RL 9}{SHFT Q}{CTRL Ø}UIT {SH
    FT P}ROGRAM"          :REM*72
41Ø PRINT"{2 CRSR DNs} {CTRL 9}{
    6 SPACEs}{SHFT P}RESS THE {S
    HFT A}PPROPRIATE {SHFT K}EY{
    5 SPACEs}"            :REM*2Ø1
415 GOSUB1Ø5:IFA$="Q"ORA$="{SHFT
     Q}"THENGOSUB575:CLOSE4:PRIN
    T"{SHFT CLR}":END     :REM*246
42Ø IFA$="P"ORA$="{SHFT P}"THEN2
    6Ø                    :REM*237
425 IFA$="L"ORA$="{SHFT L}"THENG
    OSUB575:GOSUB5ØØ:GOTO375
                          :REM*162
43Ø IFA$="D"ORA$="{SHFT D}"THEN1
    2Ø                    :REM*221
435 IFA$="S"ORA$="{SHFT S}"THENG
    OSUB455:GOTO375       :REM*8Ø
44Ø IFA$="$"THENGOTO6Ø5   :REM*23
445 GOTO415               :REM*64
455 PRINT"{CRSR DN} {SHFT S}AVE
    {SHFT L}ABEL {SHFT U}NDER {S
    HFT F}ILE? "NF$       :REM*2Ø2
46Ø PRINT"{CRSR UP}"TAB(22);:INP
    UTNF$:IFNF$=""THEN375:REM*49
465 IFLEN(NF$)>12THENPRINT"12 {S
    HFT C}HRS {SHFT M}AX":PRINT"
    {3 CRSR UPs}":GOTO455
                          :REM*154
47Ø OPEN15,8,15:PRINT#15,"SØ:LM]
     "+NF$:GOSUB55Ø:IFET=8THEN37
    5                     :REM*69
475 OPEN5,8,5,"Ø:LM] "+NF$+",S,W
    ":GOSUB55Ø:IFET=8THEN375
                          :REM*176
48Ø PRINT#5,RW;CR$;PR;CR$;NC:GOS
    UB55Ø:IFET=8THEN375   :REM*5
482 FORI=1TOPR:PR$=PR$(I):IFPR$=
    ""THENPR$=">"         :REM*2Ø5
485 PRINT#5,PR$:NEXTI:GOSUB55Ø:I
    FET=8THEN55Ø          :REM*216
49Ø GOSUB565:CK=Ø:RETURN :REM*49
5ØØ PRINT"{CRSR DN} {SHFT L}OAD
    {SHFT L}ABEL {SHFT F}ROM {SH
    FT F}ILE? "NF$        :REM*231
5Ø5 PRINT"{CRSR UP}"TAB(21);:INP
    UTNF$:IFNF$=""THEN375:REM*94
51Ø IFLEN(NF$)>12THENPRINT"12 {S
    HFT C}HRS {SHFT M}AX":PRINT"
    {3 CRSR UPs}":GOTO5ØØ
                          :REM*245
515 OPEN15,8,15:OPEN5,8,5,"Ø:LM]
     "+NF$+",S,R":GOSUB55Ø:IFET=
    8THEN375              :REM*5
52Ø IFEN=62THENGOSUB555:GOTO375
                          :REM*192
525 INPUT#5,RW,PR,NC:GOSUB55Ø:IF
    ET=8THEN55Ø           :REM*59
53Ø FORI=1TOPR:INPUT#5,PR$(I):IF
    PR$(I)=">"THENPR$(I)=""
                          :REM*46
532 NEXTI:GOSUB55Ø:IFET=8THEN55Ø
                          :REM*13Ø
535 S=ST:IFS<>ØTHEN54Ø    :REM*91
54Ø GOSUB565:FL=1:RETURN:REM*234
55Ø INPUT#15,EN,EM$,ET,ES:IFEN<2
    ØOREN=62THENET=Ø:RETURN
                          :REM*44
555 PRINT"{CRSR DN} {CTRL 9}{SHF
    T D}ISK {SHFT E}{2 SHFT Rs}{
    SHFT O}{SHFT R}{CTRL Ø}"EN"{
    CRSR LF}, "EM$","ET"{CRSR LF
    },"ES:ET=8            :REM*127
56Ø PRINT" {SHFT P}RESS {CTRL 9}
    {SHFT A}NY {SHFT K}EY{CTRL Ø
    } TO {SHFT C}ONTINUE":GOSUB1
    Ø5                    :REM*166
565 CLOSE5:CLOSE15:RETURN:REM*89
575 IFCK=ØTHENRETURN      :REM*1
58Ø PRINT"{CRSR DN} {SHFT Y}OU {
    SHFT H}AVE {SHFT N}{SHFT O}{
    SHFT T} {SHFT S}AVED {SHFT Y
    }OUR {SHFT C}HANGES!":REM*32
585 PRINT" {SHFT P}RESS {CTRL 9}
    {SHFT S}{CTRL Ø}AVE {SHFT L}
    ABEL {CTRL 9}{SHFT C}{CTRL Ø
    }ONTINUE"             :REM*141
59Ø GOSUB1Ø5:IFA$="C"ORA$="{SHFT
     C}"THENRETURN        :REM*162
595 IFA$="S"ORA$="{SHFT S}"THENG
    OSUB455:RETURN        :REM*247
6Ø5 OPEN15,8,15:OPEN5,8,Ø,"$Ø":P
    RINT"{SHFT CLR}":GOSUB55Ø:IF
    ET=8THEN375           :REM*163
61Ø GET#5,A1$,A2$          :REM*28
615 GET#5,A1$,A2$          :REM*33
62Ø GET#5,A1$,A2$          :REM*38
625 IFA1$<>""THENAØ=ASC(A1$)
                          :REM*179
63Ø IFA2$<>""THENAØ=AØ+ASC(A2$)*
    256                   :REM*138
635 PRINTMID$(STR$(AØ),2);TAB(3)
    ;                     :REM*221
64Ø GET#5,A2$:IFST<>ØTHEN685
                          :REM*164
645 IFA2$<>CHR$(34)THEN64Ø
                          :REM*15
65Ø GET#5,A2$:IFA2$<>CHR$(34)THE
    NPRINT"{CTRL 9}"A2$"{CTRL Ø}
    ";:GOTO65Ø            :REM*6Ø
655 GET#5,A2$:IFA2$=CHR$(32)THEN
    655                   :REM*69
66Ø PRINTTAB(2Ø);:A3$="":REM*2Ø6
665 A3$=A3$+A2$:GET#5,A2$:IFA2$<
    >""THEN665            :REM*1Ø3
67Ø PRINTLEFT$(A3$,3)      :REM*1Ø
675 GETA$:IFA$<>""THENGOSUB695
                          :REM*223
68Ø IFST=ØTHEN615          :REM*9Ø
685 PRINT" BLOCKS FREE";:AØ=Ø
                          :REM*233
69Ø CLOSE5:CLOSE15:PRINTTAB(25)"
    {SHFT P}RESS {CTRL 9}{SHFT A
    }{SHFT N}{SHFT Y} {SHFT K}{S
    HFT E}{SHFT Y}{CTRL Ø}":GOSU
    B1Ø5:GOTO375           :REM*5Ø
695 GOSUB1Ø5:RETURN       :REM*249
```

Circle 121 on Reader Service card.

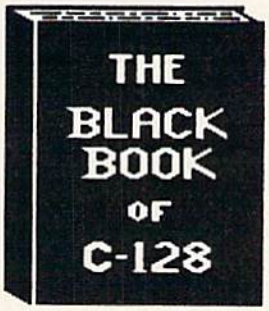
VALUE-SOFT

9513 S.W. Barbur Blvd. B-56
Portland,Oregon 97219



24 HR. TOLL FREE
1-800-547-9755 EXT.19
OR, AK, CAN, 1-503-246-0924
Add $2.00 S & H. Visa and MC 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.....

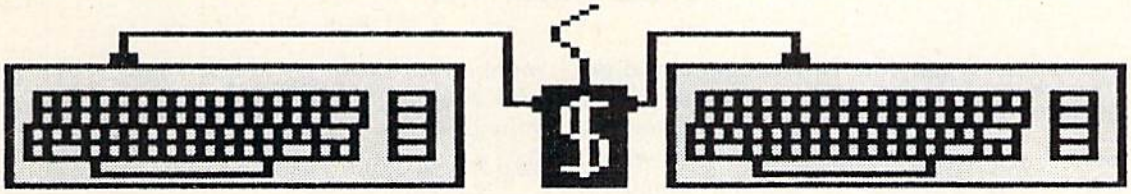
HOW TO UN-PACK THE C-128
HOW TO HOOK-UP THE C-128
TEN PAGES ON WHAT THE KEYS ARE FOR
FIFTY PAGES ON BASIC PROGRAM COMMANDS

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

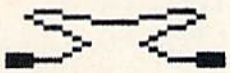
$ - SAVER SWITCH $29.95

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



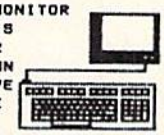
DISK DRIVES & PRINTERS
$8.95

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

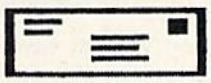
HAVE YOU EVER THOUGHT OF CATALOGING ALL THOSE MOVIES YOU HAVE BEEN SAVING ON VIDEO TAPE?

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.

Hide and Seek With Basic

Have you been plotting to protect your programs from prying eyes? Here's a short, easy-to-use method that stealthily hides your Basic programs and disables the stop key.

By KENNETH FLEE

When you list a program and get a one-line listing that reads 1 SYS 2063, or something similar, the program is usually compiled or written in assembly or machine language. The following technique allows you to write your program in Basic and then hide it to look like an assembly language or compiled program.

In addition, the stop key is disabled to keep users from exiting your program at points other than those you intend. If users list your modified program, they will see only SYS 2065—but your program will run as usual!

The Method

First, write and debug your Basic program and be certain it runs properly. Don't use program line numbers 1 and 2—these will be used to hide your program.

Now, add the following two lines to the beginning of your program.

```
1 SYS 2065
2 REMXXXXXXXXXXXXXXXX
```

Be sure to type them exactly as shown, including the single space after SYS in the first line and exactly 16 Xs immediately after REM in line 2.

Next, add the following nine lines to the end of your program. I've used line number 9900 as the starting line number, but you may use any line number you wish—as long as these nine lines are the last nine lines in your program.

```
9900 X=2060:POKE X+5,169:POKE
     X+6,225
9910 POKE X+7,141:POKE X+8,40
9920 POKE X+9,3:POKE X+10,169
9930 POKE X+11,34:POKE X+12,141
9940 POKE X+13,12:POKE X+14,8
9950 POKE X+15,169:POKE X+16,8
9960 POKE X+17,141:POKE X+18,13
9970 POKE X+19,8:POKE X+20,96
9980 POKE X,0:POKE X+1,0
```

Be sure to save your program at this point, since the next step will make the program unlistable and unalterable to everyone, including yourself!

Are you ready for a little magic? All right! Now type, in Direct mode (use no line number), the following line:

```
GOTO 9900
```

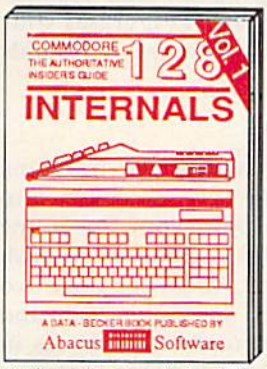
If you used some other line number for line 9900, use that line number instead. Now list your program. All you will see is 1 SYS 2065—the rest of your Basic program is hidden, safe from prying eyes.

Don't run the program yet, but save the modified version under a name different from that of the unmodified version. The new version can be loaded and saved just like any other Basic program—it just can't be listed.

RUN It Right

C-64; C-128 (in C-64 mode)

C-128™ and C-64™ REQUIRED READING



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**



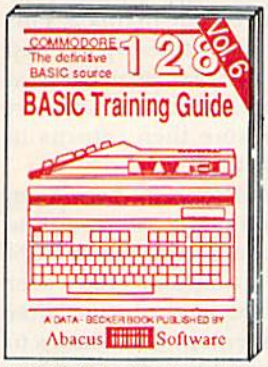
Filled with info for everyone. Covers 80 column hi-res graphics, windowing, memory layout, Kernal routines, sprites, software protection, autostarting. **300pp $19.95**



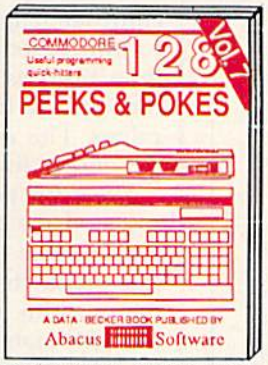
Insiders' guide for novice & advanced users. Covers sequential & relative files, & direct access commands. Describes DOS routines. Commented listings. **$19.95**



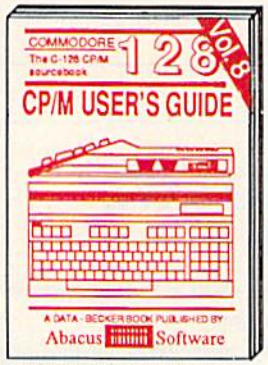
Learn fundamentals of CAD while developing your own system. Design objects on your screen to dump to a printer. Includes listings for '64 with Simon's Basic. **300pp $19.95**



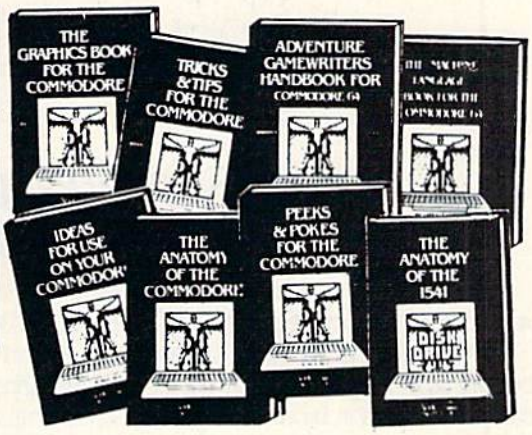
Introduction to programing; problem analysis; thorough description of all BASIC commands with hundreds of examples; monitor commands; utilities; much more. **$16.95**



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. REVISED & EXPANDED **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**

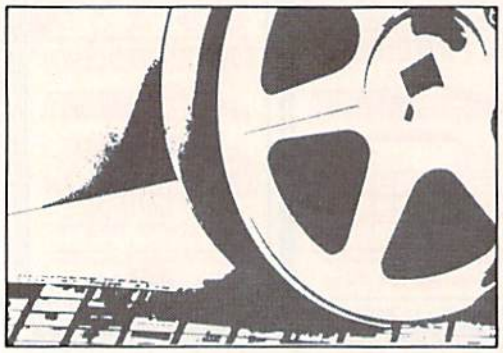
C-128 and C-64 are trademarks of Commodore Business Machines Inc.

Abacus Software

P.O. Box 7219 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 $10.00 per book. Dealer inquires welcome–1400+ nationwide.

This Publication is available in Microform.



University Microfilms International

Please send additional information for

Name

Institution

Street

City

State Zip

300 North Zeeb Road
Dept. P.R.
Ann Arbor, Mi. 48106

THE SMART WAY TO SAVE YOUR *RUN*

You'll find all your favorite issues of **RUN** in minutes—and in great condition—with smart-looking binders or file cases from Jesse Jones.

Sturdy, protective file cases make for easy access to each issue, while rugged binders allow magazines to lay flat for easy reference. Both hold 12 issues, are custom-designed in brown with gold spine lettering, and are **unconditionally guaranteed.**

Order today!
File Cases: $6.95 ea.; 3/$20; 6/$36.
Binders: $8.50 ea.; 3/$24.75; 6/$48.



YES! Please send me protection for my **RUN**:

_____ File Cases _____ Binders

I enclose my check or money order for $ _____.

Name _____

Address _____

City _____ State _____ Zip _____

US currency only. Outside US, add $2.50 per item for postage and handling. Please allow 4-6 weeks for delivery.

MAIL TO:
Jesse Jones Box Corp.
PO Box 5120-Dept. RUN
Philadelphia, PA 19141

You can now run the program to check execution, but if you didn't allow a graceful exit, you'll have to turn off your computer to end the program, since the stop key has been disabled.

To end a program you intend to hide, using the hidden Basic technique, include the following line as the Exit statement.

```
XXXX POKE 808,237:NEW:END
```

You would use an appropriate line number in place of the XXXX, of course. This program line restores the use of the stop key, erases your program from memory and ends execution.

How It Works

When you modify the program, you're tricking the computer into thinking there is only one line in the program it is listing. You accomplish this in line 9980, where you Poke two zero bytes into locations 2060 and 2061. You also replace the 16 Xs in line 2 with a short machine language routine.

When you run the program, the SYS 2065 in line 1 goes to the machine language routine in line 2. This routine first disables the stop key and then restores the two zero bytes at the end of line 1 to their correct values. The routine then returns to the end of line 1.

Since the pointers now have been restored, the computer can "see" line 2. But since line 2 contains a REM statement, the computer skips over the machine language routine after the REM statement and continues to the next program line—the first line of your Basic program.

Everything then runs as it originally did, except that a user cannot use the stop key to break into program execution. Even if the program bombs, the listing function has been messed up so that the screen will show only garbage if a user attempts to list the program at that point.

For the assembly language programmers among you, here is the routine inserted into line 2:

```
0811  A9 E1     LDA  #$E1
0813  8D 28 03  STA  $0328
0816  A9 22     LDA  #$22
0818  8D 0C 08  STA  $080C
081B  A9 08     LDA  #$08
081D  8D 0D 08  STA  $080D
0820  60        RTS
```

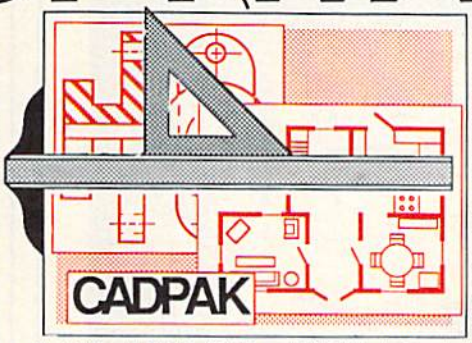

Address all author correspondence to Kenneth Flee, 2508 Valley Forge Drive, Madison, WI 53719.

Circle 8 on Reader Service card.

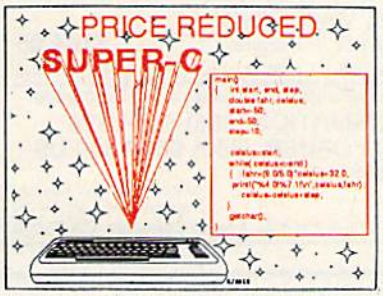
'128™ and C-64™ SPECTACULAR SOFTWARE



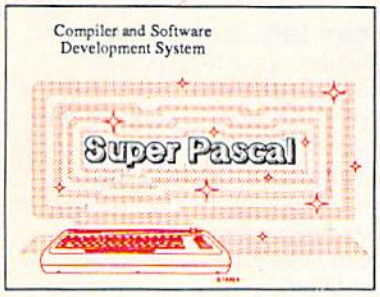
The *complete* compiler and development package. Speed up your programs 5x to 35x. Many options: flexible memory management; choice of compiling to machine code, compact p-code or both. '128 version: 40 or 80 column monitor output and FAST-mode operation. '128 Compiler's extensive 80-page programmer's 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



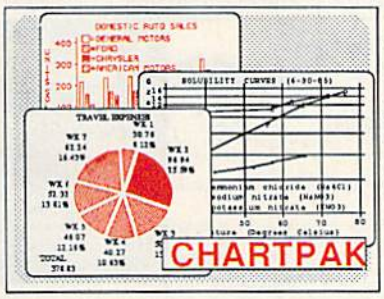
Remarkably easy-to-use interactive drawing package for accurate graphic designs. New dimensioning features to create exact scaled output to all major dot-matrix printers. Enhanced version allows you to input via keyboard or high quality lightpen. Two graphic screens for COPYing from one to the other. 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



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 $79.95



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



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

OTHER TITLES AVAILABLE:

Technical Analysis System
Sophisticated charting and technical analysis system for serious investors. Charting and analyzing past history of a stock, TAS can help pinpoint trends & patterns and predict a stock's future. Enter data from the keyboard or from online financial services. **C-64 $59.95**

Personal Portfolio Manager
Complete protfolio 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**

PowerPlan
One of the most powerful spreadsheets with integraded 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 & charts. **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**

COBOL Compiler for the C-64	$39.95
Ada Compiler for the C-64	$39.95
VideoBasic Language for the C-64	$39.95

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 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.

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).

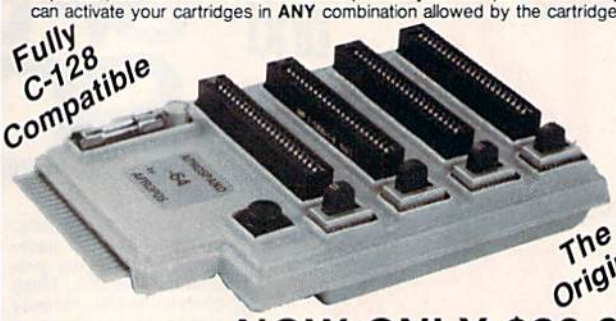
For telephone demo, additional information, or prompt service for credit card orders,

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)

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.



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	$299.95
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

APROTEK 1071-A Avenida Acaso, Camarillo, CA 93010

CA Res. Add 6% Tax. Listed are cash prices. VS & MC Add 3%

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.



SOME HISTORIC BREAKTHROUGHS DON'T TAKE AS MUCH EXPLAINING AS COMPUSERVE.

But then, some historic breakthroughs could only take you from the cave to the tar pits and back again.

CompuServe, on the other hand, makes a considerably more civilized contribution to life.

It turns the personal computer into something useful.

CompuServe is an information service. Just subscribe, and 24 hours a day, 7 days a week, a universe of information, entertainment and communications is at your service.

A few of the hundreds of things you can do with CompuServe:

COMMUNICATE

Easyplex™ Electronic Mail puts friends, relatives and business associates in constant, convenient touch.

CB Simulator lets thousands of enthusiastic subscribers "chatter away" on 72 different channels.

Over 100 Forums welcome you to join their online "discussions." They're for everyone from computer owners and gourmet cooks to physicians and game players.

Bulletin Boards let you "post" messages where thousands will see them.

HAVE FUN

Our full range of games includes "You Guessed It!," the first online TV-style game show played for real prizes; MegaWars III, the ultimate in interactive excitement; board; parlor; sports and educational games.

SHOP

THE ELECTRONIC MALL™ gives you 'round the clock shopping for name brand goods and services at discount prices from nationally known stores and businesses.

SAVE ON TRIPS

TWA Travelshopper℠ lets you scan schedules and fares, find the best bargains and order tickets online.

A to Z Travel/News Service provides latest travel news plus complete information on over 20,000 hotels worldwide.

MAKE PHI BETA KAPPA

Grolier's Academic American Encyclopedia's Electronic Edition is a complete, constantly updated general reference encyclopedia.

The College Board, operated by the College Entrance Examination Board, helps you prepare for the SAT, choose a college and get financial aid.

BE INFORMED

The AP News Wire (covering all 50 states and the nation), the Washington Post, USA TODAY Update and business and trade publications are constantly available. And our electronic clipping service lets us find, clip and file specific news for reading at your convenience.

INVEST WISELY

Comprehensive Investment Help includes complete statistics on over 10,000 NYSE, AMEX and OTC securities. Historic trading statistics on over 50,000 stocks, bonds, funds, issues and options. Five years of daily commodity quotes. Standard & Poor's. Value Line. And over a dozen other investment tools.

Site II provides demographic and sales potential information by state, county and zip code for the entire country.

And now for the pleasant surprise.

Although CompuServe makes the most of any computer, it's a remarkable value. You get low start-up costs, low usage charges and local-phone-call access in most major metropolitan areas.

Here's how to use CompuServe.

CompuServe is "menu-driven," so beginners can simply read the lists of options on their screens and then type in their selections.

Experts can just type in "GO" followed by the abbreviation for whatever topic they're after.

In case of confusion, typing "H" for help brings immediate instructions.

And you can ask general questions either online through our free Feedback service or by phoning our Customer Service Department.

How to subscribe.

To access CompuServe, you'll need a CompuServe Subscription Kit; a computer, terminal or communicating word processor; a modem and in some cases, easy-to-use communications software.

With your Subscription Kit, you'll receive a $25 usage credit, a complete hardcover Users Guide, your own exclusive user ID number and preliminary password, and a subscription to CompuServe's monthly magazine, *Online Today*.

Subscription Kits are available in computer stores, electronic equipment outlets, retail stores and catalogs. You can also subscribe with materials you'll find packed right in with many computers and modems sold today.

Make a move of historic proportions. Subscribe to CompuServe today.

To receive our free informative brochure or to order direct, call or write:

CompuServe®

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

800-848-8199
In Ohio, call 614-457-0802

EasyPlex and ELECTRONIC MALL are trademarks of CompuServe, Incorporated. Travelshopper is a service mark of TWA.

An H & R Block Company

Circle 64 on Reader Service card.

Please Send Me The Following Back Issues of ReRUN:

☐ **Buy Both Vol. I and Vol. II*—SAVE $5**
☐ Cassettes $17.94 ☐ 2 Disks $37.94

☐ **Spring Edition*** —Includes: + Tax Records 64, + CalcAid, °Quatro, and + Fly The Grand Canyon. (Runs on C-64, VIC-20, and/or C-128. Separate media for C-64 and VIC-20. Please specify.)

☐ **GAMEPAK**—Features never-before-published games: Ski, + Hassle-Castle, and + Lava Pit, Plus, **RUN** favorites like Find The Word, and Tag. (Runs on C-64/C-128.)

☐ **Summer Edition**—Includes: Sound Effects, + Joystick Artist, + Play Ball, and Money Manager. (Runs on C-64, C-128.)

☐ **Fall Edition**—Includes: Home Run Derby, Turtle Graphics, Big Letters, Function Keys, Test Maker, Flynn's Gold, + Disk Doctor, and more! (Runs on C-64, C-128.)

☐ **Productivity Pak Disk** + —Includes: Home Finance Aid, Basic 4.5, Datafile, DF Mail, DF Report, DF Print, DF Calc, Run Term, Run It Write, Disk Master, Graphmaker, Memo, Screen Print (programs run on C-64/C-128 in 64 Mode only)

☐ **Winter Edition**—Includes: Perfect Typist, Pay the Bills, UltraQuiz, Perfect Pitch, Make Music, Source Reader, Source Print, Brainstorming, + Songfest, + Joy to the World, + Adeste Fideles, + Spirited Sprites, and more! (programs run on C-64/C-128 in 64 Mode only)

+ Available on disk only.
° Available on C-64 version only.
Disks contain more programs than cassettes.
* Separate version available for VIC-20

☐ C-64 ☐ VIC-20

☐ Cassette $11.47 each

☐ Disk $21.47 each

☐ Payment enclosed ☐ AE ☐ Visa ☐ MC

Card # _____

Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Prices include postage and handling.
Please allow 4-6 weeks for delivery.
US funds on US banks only. 5-86SI

80 Pine St. • Peterborough, NH 03458

If Your ReRUN Library Is Incomplete,



Fill In The Blanks!

Missing any of these hot selling back issues of ReRUN?

- **Volume I**
- **Volume II**
- **Spring Edition**
- **Gamepak**
- **Summer Edition**
- **Fall Edition**
- **Productivity Pak**
- **Winter Edition**

It's not too late to catch up! While quantities last, you can get every **ReRUN** published. Enjoy the most popular RUN programs on cassette or disk! It's as easy as filling out the coupon, or calling **1-800-258-5473**. In NH, dial 1-924-9471.

Easy Data Entry

By JIM ALLEN

Are you fed up with fiddling with those irksome Data statements? It's time to take the tedium out of data entry.

While typing in line after line of numeric Data statements, your fingers spend most of their time on the top row of keys, except when typing in the word DATA and commas. This machine language program, Comma Generator, changes the space bar into a comma generator, making it easy to type in commas, and uses the back-arrow key (←) to type in the word DATA.

Once you start typing in Data statements, you won't have to move your fingers off the top row of keys until you are through. This program works only for Data statements that don't contain spaces.

Using the Program

First type in Listing 1, the Basic loader program. Be sure to save it before running it, as the program erases itself after it has run. Once it's been run, the Comma Generator program is ready to be called upon.

When you enter a program with a great number of Data statements, load and run the Comma Generator program first. This way, when you're ready to enter Data statements, you won't have to save and reload the program on which you're working.

When you are ready to enter numeric or alphanumeric data (without any spaces), type: SYS679 and hit the return key. Thereafter, when you press the space bar, a comma will appear on the screen, and when you press the back-arrow key (←), the word DATA will print on the screen.

To disable the utility, hit the run/stop and the restore keys simultaneously. You can reenable the program with SYS679 without rerunning the Basic loader.

How It Works

The SYS command transfers control of the microprocessor to memory location 679 ($02A7 hex). The instructions at this location modify the hardware interrupt request (IRQ) vector and then return control to Basic.

The new IRQ vector sends the interrupt request to the machine language program at memory location 692 ($02B4 hex), to see if you are pressing the keys you want to modify. When it encounters either the space bar or the back-arrow key, that key's normal function is erased (that is, the cursor moves left), and the comma or the word DATA is added over the normal character. After that, program operation continues with the IRQ at memory location 59953 ($EA31). R

Address all author correspondence to Jim Allen, 941 Papaya Place, Brea, CA 92621.

Listing 1. *Basic loader for Comma Generator program.*

```
11Ø REM{7 SPACEs}COMMA GENERATOR    :REM*236
12Ø REM{5 SPACEs}VERSION 1.2 5/18/84
                                    :REM*23Ø
13Ø REM{8 SPACEs}BY JIM ALLEN       :REM*196
15Ø A=679-1                         :REM*21Ø
16Ø A=A+1                           :REM*242
17Ø READ D:IF D=Ø THEN 19Ø          :REM*126
18Ø POKE A,D:GOTO 16Ø                :REM*22
19Ø PRINT CHR$(147)TAB(8Ø)"{CTRL 9}SYS679{C
    TRL Ø} TO ENABLE                :REM*96
2ØØ NEW                             :REM*82
21Ø DATA 12Ø, 169, 18Ø, 141, 2Ø, 3 :REM*118
22Ø DATA 169, 2, 141, 21, 3, 88     :REM*166
23Ø DATA 96, 165, 197, 2Ø1, 6Ø, 24Ø:REM*22Ø
24Ø DATA 17, 162, 17, 142, 185, 2   :REM*34
25Ø DATA 2Ø1, 57, 24Ø, 29, 162, 29  :REM*1ØØ
26Ø DATA 142, 194, 2, 76, 49, 234   :REM*157
27Ø DATA 169, 14, 141, 185, 2, 169  :REM*171
28Ø DATA 157, 141, 119, 2, 169, 44   :REM*71
29Ø DATA 141, 12Ø, 2, 169, 2, 133    :REM*19
3ØØ DATA 198, 2Ø8, 232, 169, 5, 141 :REM*23
31Ø DATA 194, 2, 169, 157, 141, 119:REM*2Ø1
32Ø DATA 2, 162, 5, 189, 25Ø, 2     :REM*235
33Ø DATA 157, 119, 2, 2Ø2, 2Ø8, 247:REM*153
34Ø DATA 169, 5, 133, 198, 2Ø8, 2Ø5  :REM*37
35Ø DATA 68, 65, 84, 65, Ø           :REM*77
```

RUN It Right

C-64; C-128 (in C-64 mode)

Digit Fidget

By MICHAEL BROUSSARD and JIM BORDEN

Are you sick of multi-digit decimals? Isn't it time your dollars and cents made sense? Here's a program that uses string functions to format numeric output.

This article discusses a technique for sprucing up numeric output with just a little extra programming. It also provides a general-purpose subroutine that, when incorporated into your own programs, allows you to do powerful number formatting. Consider the following program statement:

```
100 PRINT "THE COST WAS $";C
```

If the value of the variable C is 12.347, the above statement will print:

```
THE COST WAS $ 12.347
```

This format may be acceptable for most applications, but if you are as obsessed by neatness and order as I am, you'll prefer seeing the output like this:

```
THE COST WAS $12.35
```

In the second example, notice that there's no space between the dollar sign and the number, and that the fraction has been rounded to the nearest cent. The trick is to take the numeric value in C (12.347) and convert it to a string value that looks the way you want it to look ("$12.35"). Once you have built such a string (called S$, for example), you can get the output you want with the statement:

```
100 PRINT "THE COST IS ";S$
```

S$ must be built in stages. The obvious first step is to start off with a dollar sign:

```
10 S$="$"
```

Next, you want to isolate the dollar part of C (the 12 of the 12.347). This can be done with the statement:

```
15 D=INT(C)
```

Now you have the dollar amount stored in the variable D. Converting it to a string is easy enough:

```
20 D$=STR$(D)
```

The STR$ built-in function converts a number to a string, but the result contains a leading blank if the number is positive, a minus sign if it is negative. If you assume your program will handle only positive dollar amounts, you don't want the extra space, so you can discard it when you add the dollar amount to your output string:

```
25 S$=S$+MID$(D$, 2)
```

The above statement means, "take the rest of D$, starting at the second character (this skips the leading blank), and add it to the end of S$." S$ now contains the string "$12". The next step is to add the decimal point:

```
30 S$=S$+"."
```

Now S$ contains "$12." and it is time to worry about the cents part. The assignment statement:

```
35 N=C-D
```

means "subtract the dollars (D) from the cost (C) and put the result in the variable N." With respect to the example, subtracting the dollars (12) from the cost (12.347) leaves the cents (.347) in N. You are interested in working with a whole number of cents, so you must multiply the fraction stored in N by 100. (In the example, multiplying .347 by 100 gives you 34.7 cents.) To round to the nearest cent, add half a cent and use the INT function to discard any fraction. You can accomplish all this with the statement:

```
40 N=INT((N*100)+.5)
```

This leaves you with the value 35 (cents) in N, which you can then convert to a string:

```
45 N$=STR$(N)
```

The last step is to append the cents to the end of S$:

```
50 S$=S$+MID$(N$, 2)
```

You had to go through a lot of program steps, but S$ now contains the string "$12.35".

RUN It Right

C-64; C-128 (in C-64 or C-128 mode)

Toll Free Order Line

1-800-387-3208

PRO·LINE SOFTWARE

SERIOUS SOFTWARE

WORDPRO 128™ All applicable features of the previous WordPro Series programs.
PLUS: Fully proportional printing...with character and word spacing capability. Multiple disk drives...up to four CBM™, MSD™, or Indus GT™ drives 500 lines of text per file... 80 colums wide. Alternating headers, footers, pages and margin offsets. Selectable double column output. Supports more than 50 different matrix and letter quality printers. An OOPS! buffer...for easy proof reading. Access to all available special characters on your printer. Display of those special characters on the screen. Local and Global options. 80 column text entry and video output. 160 column graphic page display...for easy formatting. Automatic file name storage. $69.95

WORDPRO 64 the first of the completely new generation of word processing programs for Commodore computers. WORDPRO 64 is all you've ever dreamed of in a word processor. You'll be able to view an entire 160 column page on a single 40 column screen, scroll sideways, output in columnar form, pick your own screen and text colour, and configure the program to your own unique requirements – and words won't break at the end of a screen line. You won't believe what else Steve has put in WORDPRO 64, like single pass double column output! Easy to use and easy to define Special Characters. Margin offset for double side printing and 100% proportional spacing capability! Available now. $49.95

C POWER is a fully implemented Kernihan and Ritchie version of the "C" language for the Commodore 64. Written by Brian Hilchie, our new C Power package includes a C SHELL command interpreter, EDITOR, SYNTAX CHECKING EDITOR, COMPILER, LINKER, MATH LIBRARY, STANDARD LIBRARY, and SYSTEM LIBRARY. C POWER compiles directly to native 6510 machine code, and does not require the extra overhead of some competing C Compilers that compile to "P" code or use some other intermediate step. C POWER is a serious cookie. $99.95

SPELLPRO 64 is a new and sophisticated state-of-the-art spell checking program by Jim Butterfield and Pro-Line Software for the WordPro Series of word processing programs. SpellPro's "Butterfield Basic" dictionary may be expanded to check up to 50,000 words, and SpellPro's ease of use is second to none. Anyone familiar with WordPro will be able to use SpellPro instantly. SpellPro 64 can be used with a Commodore 1541 or compatible disk drive and a Commodore or suitably interfaced ASCII printer (works with Speedscript). $49.95

PROFILE 64 is the latest creation of Steve Punter, the originator of the WordPro Series of word processors. As with WordPro, Steve has made ProFile the most easily learned data base yet. Anyone familiar with WordPro will find the family resemblance comforting and will have ProFile off and running right out of the box. ProFile can cram as many as 4000 records on just one CBM 1541 format diskette, print as many mailing labels across a page as the printer can handle and can print out reports with multi-line headers and automatic page numbers. ProFile is the first easy-to-use data base program worthy of the Pro-Line name. For the Commodore 1541 or compatible disk drive and a Commodore or suitably interfaced ASCII printer. $49.95

POWER 64 is ready to delight and amaze a new generation of programmers on the Commodore 64 machine. If you like Brad Templeton's POWER programmer's utility on other Commodore computers, you'll love the extra features Brad was able to implement in the new POWER 64, a BASIC programmer's toolkit. Jim Butterfield wrote the book and Brad Templeton the program. For the Commodore 64 equipped with a Commodore 1541 disk drive. Includes MorePower free. $49.95

CASHBOX 64 by Howard Rotenburg brings point of sale Inventory control to your Commodore 64 in an easy to learn program that any Salesperson can operate. Cashbox handles both cash and credit cards by name. Inventory is automatically adjusted by each sale. Inventory reports can be printed by ITEM or SUPPLIER, including wholesale/retail costs, reorder levels, and stock on hand and on order. Access is password controlled for security. Sales reports can be printed with daily, weekly, and monthly totals. Personnel reports will list all of your personnel with important information including salaries, starting dates, social insurance and more. It will also report sales and returns by employee, permitting you to assess performance. $49.95

PAL 64 is the very first truly sophisticated machine language assembler available for the new Commodore 64 computer. PAL 64, Brad Templeton's "Personal Assembly Language," a machine language toolkit, is a natural for the 64 and works particularly well in conjunction with POWER 64. Some of the best 65XX programmers in the world are already in love with PAL 64 (they must be, because without exception they all refused to give up their PAL 64 assembler after testing it). PAL 64 comes complete with a finely detailed manual by Brad Templeton. Your PAL 64 is waiting for you now at your Pro-Line Software dealer. $49.95

CADPIC 64 is a sophisticated Commodore 64 drawing and printing program that includes many exceptional features: automatic shapes include parallelogram and ellipse; multi-colour brush patterns that you can design yourself; save all or just portion of picture; and text mode including Commodore graphics. Help-menus are available, but stay quietly out of sight while you draw – even when you change colours or shapes. Printout options include black and white prints, colour separation prints, and tapestry/needlework charts. Suitable printers include: MPS801, MPP1361, 8023P, Commodore 1525, hi-res Epson and Gemini. Finally, your CADPIC pictures can be loaded from BASIC making them easy to include in your own programs. $49.95

HIGH PRODUCTIVITY...for your 1541!
The NEW GT4 'HI-PRODUCTIVITY' Cartridge from PRO-LINE turns your old, slow 1541 disk drive into a fully functioned, super fast, state-of-the-art SUPER DRIVE. NO INSTALLATION...simply plug the GT4 Cartridge into your Commodore 64's cartridge slot. FAST load...FAST save...FAST directory... FAST single disk backup FAST dual disk backup... FAST header...FAST...FAST...FAST!!! NEW, added 'BASIC 4.0' commands allow the luxury and convenience of Commodore DISK BASIC, such as: HEADER, DIRECTORY, CATALOG, COLLECT, BACKUP, RENAME, SCRATCH, DLOAD, DSAVE, DOPEN, DCLOSE, and RECORD No. NEW, added 'EXTRA' commands like DVERIFY, DSTAT, OFF, DISABLE and RESET... $29.95

DEALERS CALL US AND JOIN THE TEAM!

Toll Free Order Line

1-800-387-3208

PRO·LINE SOFTWARE

755 The Queensway East, Unit 9, Mississauga, Ontario, Canada L4Y 4C5 . Phone 416-273-6350

In the above example, each part of the conversion, from number to formatted string, was illustrated with a separate program statement so that each step would be easier to understand. The following short program is a more compact version of the same algorithm.

```
5 INPUT "INPUT AN EXAMPLE COST";C
10 S$ = "$" + MID$(STR$(INT(C)), 2) + "."
15 N$ = MID$(STR$(INT(((C - INT(C))
   *100) + .5)), 2)
20 IF LEN(N$) = 1 THEN N$ = "0" + N$
25 S$ = S$ + N$
30 PRINT "THE COST WAS ";S$ : END
```

Line 20 of the above sample program takes care of those instances when the cents part of the cost is less than 10. When that happens, insert an extra 0 so that the cents string is two characters long.

Numeric Editing

The rest of this article discusses a subroutine you can use in your own programs to make editing numbers a snap. It is more flexible than the sort of program shown above, and it's easy to use.

You must put the value to be edited in a variable called PN. Next, you set the string variable PM$ to a mask, or format, describing how you want the output to look (a complete discussion of masks, along with examples, appears below).

Once these two variables are set, you invoke the subroutine with a Gosub statement. The edited result will be stored in the variable PR$. That's all there is to it! Let's look at an example.

Suppose you wish to print the value of a variable called X, with five places to the left of the decimal and three places to the right. The following program fragment shows how it would be done.

```
100 PN = X : REM INIT SUBROUTINE
    VARIABLE
110 PM$ = "#####.###" : REM SET MASK
120 GOSUB 50000 : REM CALL
    SUBROUTINE
130 PRINT "THE RESULT IS ";PR$
```

In an edit mask, the symbol # stands for a digit. The example mask shows five digits, then the decimal point, then three more digits. If you run the above program with X equal to 123.4, the resulting string, PR$, will contain 123.400 with two blank spaces to the left of the first digit.

Notice that there are two blanks at the beginning of the result, since the input value (123.4) has only three digits to the left of the decimal, whereas the mask specifies five before the decimal.

Also notice that the edit subroutine pads the right of the decimal with zeros. If there are more digits to the right of the decimal than are provided in the mask, the result is rounded. If there are more digits to the left than are provided in the mask, an error occurs. In case of an error, the result will contain question marks in place of the number that is too big, and the subroutine variable PE will be set to −1 so the program can check for an error. (If no error occurs, PE is set to 0.)

Below are some examples. The PN column shows the input value, while the PM$ column shows the mask. The PR$ column shows what the result will be after invoking the subroutine with the given PN and PM$ values.

PN	PM$	PR$
1.23	#####.###	" 1.230"
123.4578	#####.###	" 123.458"
0.235	#####.###	" 0.235"
12345	#####.###	"12345.000"
123456	#####.###	"?????.###"

In all of the examples above, padding on the left, if necessary, is done with blanks. This is the default, but you can specify a different pad character in the mask. You do this by putting the special character ">" in the mask and following it immediately with the character you want to use for padding. Here are some examples:

PN	PM$	PR$
1.23	>*####.##	"***1.23"
12.4578	>0####.##	"0012.46"
0.235	>-####.##	"---0.24"
1234	>*####.##	"1234.00"

Notice that in the last example above, a pad character of "*" is specified, but the result doesn't show any asterisks. This is because the input value fits the mask perfectly and no padding is necessary.

If you specify a dollar sign ("$") as the pad character, it is handled in a special way. The dollar sign will "float" to the position right before the number portion of the result, and the left will be padded with blanks. Here are some examples:

PN	PM$	PR$
1.23	>$####.##	" $1.23"
12.4578	>$####.##	" $12.46"
0.235	>$####.##	" $0.24"
1234	>$####.##	"1234.00"

Again, in the last example, notice that the input value fits the mask perfectly, and the pad character ("$") does not appear in the result.

There are a few other things you should know about masks. When a mask does not specify a decimal point, the value of PN will be rounded to the nearest whole number in the resulting PR$. A numeric variable with more than nine digits to the left of the decimal is so large that Basic stores it in scientific notation, and it can't be edited by the subroutine.

Finally, you may include other miscellaneous characters in the mask. If they appear before or after the part of the mask that describes how the number will look (the part made up of #s), they are simply copied into the output string. Inside the numeric part of the mask (left of the decimal), they are included as part of the output value or are replaced by the pad character. Study the examples below.

PN	PM$	PR$
−27.7823	>0######	"−00028"
−27.7823	>*######	"***−28"
0.7823	#.#####	"0.78230"
1234.56	$>*###,###.##	"$**1,234.56"
4.56	$>*###,###.##	"$******4.56"
4.56	DM >0###.##	"DM 004.56"
421879966	###-##-####	"421-87-9966"
60983	>0##/##/##	"06/09/83"

In the accompanying program listing, lines 5–60 are a short "driver" program, provided so that you can try out the subroutine.

The subroutine itself begins at line 50000 and has been carefully written so that all the variables it uses have two-character names, all starting with the letter P. As long as you avoid variable names of this form, you can use the subroutine without worrying about inadvertently affecting your other program variables. Have fun!

Digit Fidget and the C-128

Although Digit Fidget will work fine on the C-128, Basic 7.0 offers the Print Using command to make formatting numbers very easy. The entire Digit Fidget subroutine can be replaced by only one line! However, the syntax (or structure) of the format string is a bit different. Let's first look at how you set up the command in Basic 7.0. (See pp. 280–283 of the system guide if you have a C-128.)

The syntax is:

```
PRINT USING "format string";list
```

The format string is the string used to form the result. You must use quotation marks (or a string variable) for the format string. A semicolon then separates the format section from the list of items to print. If more than

Lyco Computer Marketing & Consultants



SAVE ON THESE IN STOCK PRINTERS



1091 . . . . . $228

DIGITAL DEVICES
16K BUFFER 75
32K BUFFER 89
64K BUFFER 125

SEIKOSHA
SP-1000UC (C-64) ... 169
SP-1000A Centronics . 185

CORONA
LP300 Laser Printer 2686
200361 Toner Cartridge 89

C. ITOH
Prowriter 8510 sp+ ... Call
15505 sp+ ..... Call
Printmaster ..... Call

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

CITIZEN
MSP-10 255
MSP-15 355
MSP-20 337
MSP-25 495

OKIDATA
Okimate 10 179
Okimate 20 ..... CALL
182 214
192 348
193 563
84P 645

BROTHER
HR-15XL-P 359
HR-15XL-S 359
HR-35P 839
HR-35S 839
2024L-P 949
M1009-P 189

JUKI
Juki 6100 344
RS232 Serial Board 55
6100 Tractor 119
6100 Sheet Feeder 209
Juki 6300 757

LEGEND
880 188
1080 ..... Call
1380 258
1385 289
808 148

DIABLO
D25 549
630 API 1599
630 ECS 1759
D 80 1F 2395
P 32 CQ1 699
P 38 1749
C 150 999
DX-35 (NEW) ..... CALL
AP-80 ..... CALL

SG-10 . . . . $205

PANASONIC
109 228
3131 (NEW) 264
1092 325
3151 409
1080 (NEW) 209
1592 (NEW) 439

SILVER REED
EXP400 249
EXP500 295
EXP550 399
EXP770 749

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

TOSHIBA
P1340 469
P351+ 1149
P341P 969
P341S 999
351 Sheet Feeder 529

MONITORS

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

TEKNIKA
MJ-10 Composite 179
MJ-22 RGB 255

TAXAN
115 12" Greeen Composite ... CALL
116 12" Amber Composite ... CALL
121 12" Green TTL 135
122 12" Amber TTL 145
220 14" Color Composite 259
410 12" RGB Hi Res IBM 329
420 12" RGB Super Hi IBM 409
440 12" RGB Ultra Hi Res 555
Tilt Stand 35

PRINCETON GRAPHICS
MAX-12 Amber 165
HX-12 RGB 465
SR-12 RGB 595

PANASONIC
DT1300D 13" RGB/Composite ... 247
DTM140 14" RGB/Composite ... 329
DTH103 10" RGB Hi Res 395
DTS101 10" Composite 175
DT1000G 10" RGB 166
TX12H3P 12" Color 419
TR120M1PA 12" Green 109
TR120MBPA 12" Amber 109
TR122M9P 12" Green IBM 148
TR122MYP 12" Amber IBM 148

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

NEC
JB-1260 Green 95
JB-1201 Green 135
JC 1215 Color 235
JC 1216 RGB 375
JC 1460 Color 265

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

MODEMS

HAYES
Smartmodem 300 133
Smartmodem 1200 377
Smartmodem 1200B 347
Smartmodem 2400 598
Micromodem IIE 135

TELE LEARNING
Total Telecommunications (C-64) 29.95
AP-250 (300 Baud Apple) 69.95
IB-250 (300 Baud IBM) ... 69.95

ANCHOR
Volksmodem 55
Volksmodem 12 166

RACAL-VADIC
2400PC 549
2400PA 799
2400V 559
1200PC 329
300V 205
300PC 199

DRIVES

INDUS
Indus GT Atari 195
GT Commodore 209

MSD
SD1 Drive (C-64) 229
SD2 Drive (C-64) 469

COMTEL
Enhancer 2000 (c-64) 179

DISKETTES

DENNISON
ELEPHANT 5¼" SSSD ... 11.99
ELEPHANT 5¼" SSDD ... 12.99
ELEPHANT 5¼" DSDD ... 14.99
PREMIUM 5¼" SSDD ... 13.99
PREMIUM 5¼" DSDD ... 15.99

VERBATIM
5¼" SSDD 13.99
5¼" DSDD 19.99

BONUS
5¼" SSDD 8.99
5¼" DSDD 12.99

COMMODORE
C-128 NEW ..... CALL
1571 Drive ..... CALL
1572 Drive ..... CALL
1902 Monitor ..... CALL
1670 Modem ..... CALL
C-64 Computer ..... CALL
1541 Drive 189
MPS801 Printer ..... LOW
1702 Monitor 199
Simon's Basic 24.75
Assembler 64 ..... 34.75

SSI (C-64)
Colonial Conquest 24.75
Wings of War 24.75
Computer Ambush 34.75
Field of Fire 24.75
Fighter Command 36.75
Kampfgruppe 36.75
Mech Brigade 36.75
Market Garden 29.75
Six Gun Shootout 24.75
Computer Baseball 24.75
Computer Quarterback ... 24.75
Imperium Galactum 24.75

BRODERBUND
The Print Shop 28.75
Graphics Library 18.75
Graphics Library II 19.75
Graphics Library III 19.95
Karateka 19.75
Castles Dr. Creep 19.75
Bank St. Writer 32.75
Loderunner 20.75
Mask of the Sun 24.75
Spelunker 19.75
Serpent's Star 24.75
Whistler's Brother 18.75

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
Hellcat Ace 18.75

SUB LOGIC (C-64)
Flight Simulator II ... 32.75
Night Mission Pinball 20.75

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.

PUDEF	FORMAT STRING	NUMBER	RESULT
"0"	"######"	-27.7823	"000-28"
"*"	"######"	-27.7823	"***-28"
" "	"#.#####"	.7823	"0.78230"
"*"	"$###,###.##"	1234.56	"$**1,234.56"
"*"	"$###,###.##"	4.56	"$******4.56"
"0"	"DM ###.##"	4.56	"DM 004.56"
" -"	"###,##,####"	421879966	"421-87-9966"
"0/"	"##,##,##"	60983	"06/09/83"

Table 1. *The last set of Digit Fidget numbers in Basic 7.0 format.*

one item is in the list, separate them with commas.

Here are some examples:

```
PRINT USING "####";123
PRINT USING X$;12.5
? USING "###.##";A,B,C
```

Notice that the last example uses the question mark to abbreviate the word PRINT—this works fine and is the general syntax. Now let's look at each of the format characters that make up the format field.

The following symbols are used in Basic 7.0 format strings:

Used for one digit in field.
+ Used to force a sign (+ or −) in the field.
− This will force a leading space or minus sign in the field.
. Used to position the decimal point.
, Used to add commas (9,153).
$ Used for a floating dollar sign.
↑↑↑↑ Used to force scientific notation.
= Used to center a string within a field.
> Used to right-justify a string in a field.

The # character defines the width of a field. For example,

```
PRINT USING "####";123
```

would print the string " 123" (without the quotation marks). If more digits than # characters are used, no numbers will appear, since they would exceed the width of the field. Instead, asterisks will replace the number signs (in this example, ****). Remember that the field width determines the maximum width for *all* characters (digits and others).

You may use the + or − sign anywhere in the format string. Doing so forces that sign to be added to the number. This sign will *not* float within the number. The position of the sign in the format string is where it will appear in the final number. Here are some examples (with the result printed to the right to save space):

```
? USING "-###";15          -15
? USING "+####";11.2       +11
```

The "." character just reserves a place for the decimal point. A syntax error will result if more than one decimal point is included in a format string.

The comma character can be used to print numbers in easy-to-read form. For example,

```
? USING "##,###.##";12596.745
```

would print 12,596.75, with the comma inserted as shown in the format field.

The dollar sign floats if used within the format field. It will be placed before the first digit. A bug in the Print Using command will cause a leading comma to be printed if the floating dollar is used. For example,

```
PRINT USING "#$#,###";999
```

prints $,999. A dollar sign placed before the first # will print the $ where it is shown in the format field; thus,

```
PRINT USING "Total = $#,###";999
```

will print Total = $ 999.

The four up-arrow symbols will force the result to be printed in scientific notation. Use enough # characters to get the number of digits you want. For example,

```
PRINT USING "###↑↑↑↑";123456
```

would print 123E+03.

To change the default characters of filler (space), comma, decimal point or dollar sign, use the Basic 7.0 keyword PUDEF. Simply insert in the proper position the new character you want to use. If you want to print a minus sign instead of the comma, type PUDEF" -". You must fill all character positions up to the one you wish to change (here, the space *must* be included). If you want to print the British pound instead of the dollar sign, type PUDEF" ,.£". Any changes you make with PUDEF will remain until another PUDEF change is made.

See Table 1 for the last set of Digit Fidget numbers in Basic 7.0 format. (Use the PUDEF, if required, before the Print Using command.)

You should note that if you redefine characters with PUDEF, you must use the original format character—that is, a pound, comma, period or dollar sign. If these are outside the #s, they will not be replaced. (In that case, they are text, so you can print exactly what you want.)

You now have a format subroutine for the C-64 and a powerful keyword for the C-128. Enjoy them in your programs. R

Address C-64 questions to Michael Broussard, 13136 Lazy Glen Court, Herndon, VA 22071; address C-128 questions to Jim Borden, Borden Software, 641 Adams Road, Carlisle, PA 17013.

Listing 1. *Number formatting program for the C-64 or C-128.*

```
5 PRINT"{SHFT CLR}":PRINT:PRINT"TYPE 'END'
  INSTEAD OF A MASK TO END"          :REM*197
7 PRINT"PROGRAM."                    :REM*229
10 PRINT:PRINT"SURROUND MASK WITH QUOTES IF
   IT"                               :REM*22
15 PRINT"CONTAINS COMMAS.":PRINT:PRINT
                                     :REM*7
20 INPUT"INPUT MASK";PM$:IFPM$="END"THEN EN
   D                                 :REM*150
25 INPUT "VALUE TO BE EDITED";PN     :REM*15
30 GOSUB50000                        :REM*44
35 REM CHECK FOR ERROR FROM SUBROUTINE
                                     :REM*49
40 IFPE THEN PRINT "ERROR!"          :REM*24
60 PRINT"RESULT: ";CHR$(34);PR$;CHR$(34);".
   ":GOTO20                          :REM*242
49997 REM                            :REM*78
49998 REM----------------------------
                                     :REM*19
49999 REM NUMBER FORMATTING SUBROUTINE
                                     :REM*64
```

Listing 1 continued.

```
5ØØØØ PL=LEN(PM$):PE=Ø:PR$="":PC=Ø:PP$=" ":
      PF=Ø:PI=1:PS=Ø:PX=PN              :REM*55
5ØØØ5 PL$="":IF PX<ØTHENPS=1:PX=ABS(PX)
                                        :REM*118
5ØØ1Ø IF PI>PLTHENRETURN                :REM*151
5ØØ15 PT$=MID$(PM$,PI,1):IFPT$<>"#"THEN5Ø14
      Ø                                 :REM*14
5ØØ17 IFPI>1ANDPF=ØTHENIFMID$(PM$,PI-1,1)="
      ."THENPF=PF+1                     :REM*1ØØ
5ØØ2Ø PL$=PL$+PT$:PI=PI+1:IFPT$="#"THENPC=P
      C+1                               :REM*71
5ØØ25 IF PI>PL THEN5ØØ35                :REM*14
5ØØ3Ø PT$=MID$(PM$,PI,1):IF (PT$<>"."ANDPF=
      Ø)OR PT$="#" THEN 5ØØ2Ø           :REM*1
5ØØ35 PF=PF+1:IFPF>1THEN5Ø12Ø           :REM*2ØØ
5ØØ4Ø IFPI<=PLTHENIFMID$(PM$,PI,1)="."THEN5
      ØØ45                              :REM*147
5ØØ42 PX=PX+.5:PF=2                     :REM*43
5ØØ45 PT$=STR$(INT(PX)):PT$=MID$(PT$,2)
                                        :REM*3Ø
5ØØ5Ø P1=LEN(PT$)+PS:IFPC>=P1 THEN5ØØ6Ø
                                        :REM*13
5ØØ55 PE=-1:PT$="??????????????????????":PF
      =2:PI=PI-1                        :REM*13Ø
5ØØ6Ø PK=LEN(PL$):PJ=LEN(PT$)           :REM*119
5ØØ65 IF MID$(PL$,PK,1)<>"#"THEN5ØØ8Ø
                                        :REM*196
5ØØ7Ø PL$=LEFT$(PL$,PK-1)+MID$(PT$,PJ,1)+MI
      D$(PL$,PK+1):PJ=PJ-1              :REM*159
5ØØ75 IFPJ=ØTHEN5ØØ82                   :REM*36
5ØØ8Ø PK=PK-1:IFPK>ØTHEN5ØØ65           :REM*89
5ØØ82 IF PSANDPE=ØANDPP$<>"Ø"THENPL$=LEFT$(
      PL$,PK-2)+"-"+MID$(PL$,PK):PK=PK-1
                                        :REM*75
5ØØ85 IFPP$="$"ANDPK>1THENPL$=LEFT$(PL$,PK-
      2)+"$"+MID$(PL$,PK):PP$=" ":PK=PK-1
                                        :REM*48
5ØØ9Ø IFPP$<>"Ø"ORPK<2THEN5Ø11Ø         :REM*231
5ØØ95 FORPJ=1TOPK:PT$=MID$(PL$,PJ,1):IFPT$=
      "#"THENPT$=PP$                    :REM*172
5ØØ97 IFPSANDPP$="Ø"THENPT$="-":PS=Ø:REM*42
5Ø1Ø5 PL$=LEFT$(PL$,PJ-1)+PT$+MID$(PL$,PJ+1
      ):NEXT:PK=Ø                       :REM*134
5Ø11Ø IFPK>1THENPL$=MID$(PL$,PK):FORPJ=1TOP
      K-1:PL$=PP$+PL$:NEXT              :REM*87
5Ø115 PR$=PR$+PL$:GOTO5Ø135             :REM*22Ø
5Ø12Ø PT=PX-INT(PX):PT=INT(PT*1Ø{UP ARROW}P
      C+.5):PT$=MID$(STR$(PT),2)        :REM*51
5Ø125 P1=PC-LEN(PT$):IFP1>ØTHENFORP2=1TOP1:
      PT$="Ø"+PT$:NEXT                  :REM*1Ø8
5Ø13Ø PR$=PR$+PT$                       :REM*223
5Ø135 PT$=MID$(PM$,PI,1):PC=Ø           :REM*184
5Ø14Ø IFPT$<>">"THEN5Ø15Ø               :REM*177
5Ø145 PI=PI+1:IFPI<=PLTHENPP$=MID$(PM$,PI,1
      ):GOTO5Ø155                       :REM*48
5Ø15Ø IFPE=ØTHENPR$=PR$+PT$             :REM*53
5Ø155 PI=PI+1:IFPF>1THENPR$=PR$+MID$(PM$,PI
      ):RETURN                          :REM*16
5Ø16Ø GOTO5ØØ1Ø                         :REM*241
```


commodore

COMPUTER PRODUCTS AT . . .
COMPUTER CREATIONS

Call TOLL FREE for Software Prices Not Listed!!!

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

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

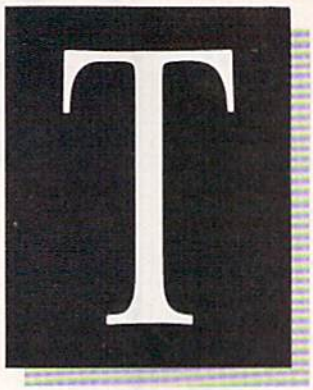
5¼"	Black Generic Bulk		Colored Generic Bulk	
BULK	SS/DD	DS/DD	SS/DD	DS/DD
20-69	.69 ea.	.89 ea.	.79 ea.	.99 ea.
70+	.59 ea.	.79 ea.	.69 ea.	.89 ea.

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.



By ROBERT SIMS

Telecomputing Workshop is a monthly column directed to the needs of RUN *readers who are using, or intend to use, their Commodore computer for telecommunications. This month, we'll cover a wide range of topics, including Runterm Plus, the 1660 and downloading.*

I have some experience with machine language programming and I would like to make some changes to Runterm Plus, such as adding an automatic dialing routine and increasing the size of the capture buffer. Would you give me some hints on how I can modify the program? (I have the Supermon machine language monitor.) Also, can I get the source code to look at?

Carl Williams
Stamps, AR

First, for novices, a machine language monitor like Supermon is a program that allows you to load a machine language program, so you can look at the hexadecimal code and make changes directly to it. An assembler, on the other hand, translates assembly language mnemonics, or source code, into machine code.

Using a monitor to modify a machine language program is almost an impossible mission. All programs reserve certain areas of memory to contain variables, buffers, and so on. It's very difficult to tell, just by looking at the machine code, where these areas are; therefore, it's easy to mess up the program by locating your new code in a reserved area. Also, adding even a single byte into the middle of the code can cause all the following commands to address the wrong areas of memory. If that happens, you have a real mess.

To modify a program without going insane, your best bet is to obtain the source code, make your changes, then reassemble the entire program.

Runterm Plus was assembled using several dozen routines that I have written over the past three years. I have arranged with the QuantumLink network to put that source code, along with source code for my bulletin board systems, into the Telecommunications databases in the Commodore Information Network.

The source files containing terminal routines begin with BOZT; the bulletin board files begin with BOZB. Feel free to download these source files and use them for reference to modify Runterm Plus or to build your own terminal program or bulletin board system.

I noticed in your April column that you referred to "old" and "new" versions of the Commodore 1660 modem. How do I tell which version I have, and what's the difference between the two?

William Deavors
Colorado Springs, CO

There are two ways to tell which version you have. First, if the manual includes a section describing how to change the modem's circuits for a C-64, then you have the new version. Also, you can look at the modem itself. Turn your 1660 over and look at the back, where it plugs into the computer. If you see a small section of exposed circuit board (about ⅛ inch), then you have the new version.

The main difference between the two versions is that the new one allows a programmer to detect a carrier signal directly from location 56577 in memory, and the old version does not. Also, the new version has improved circuitry that makes the modem completely compatible with the C-64.

If you have an old version of the 1660 and want to upgrade it, you should take it to your local Commodore service center—check with Commodore customer service in West Chester, Pennsylvania, for the nearest service center.

I have owned a modem for three months now, using it mostly to call bulletin boards in my area. Recently, I heard about Viewtron from a friend and tried to log on using the terminal program that came with my modem. Is there some reason why a terminal program will work with bulletin boards, but not work with a national network?

Ann Miller
Pontiac, MI

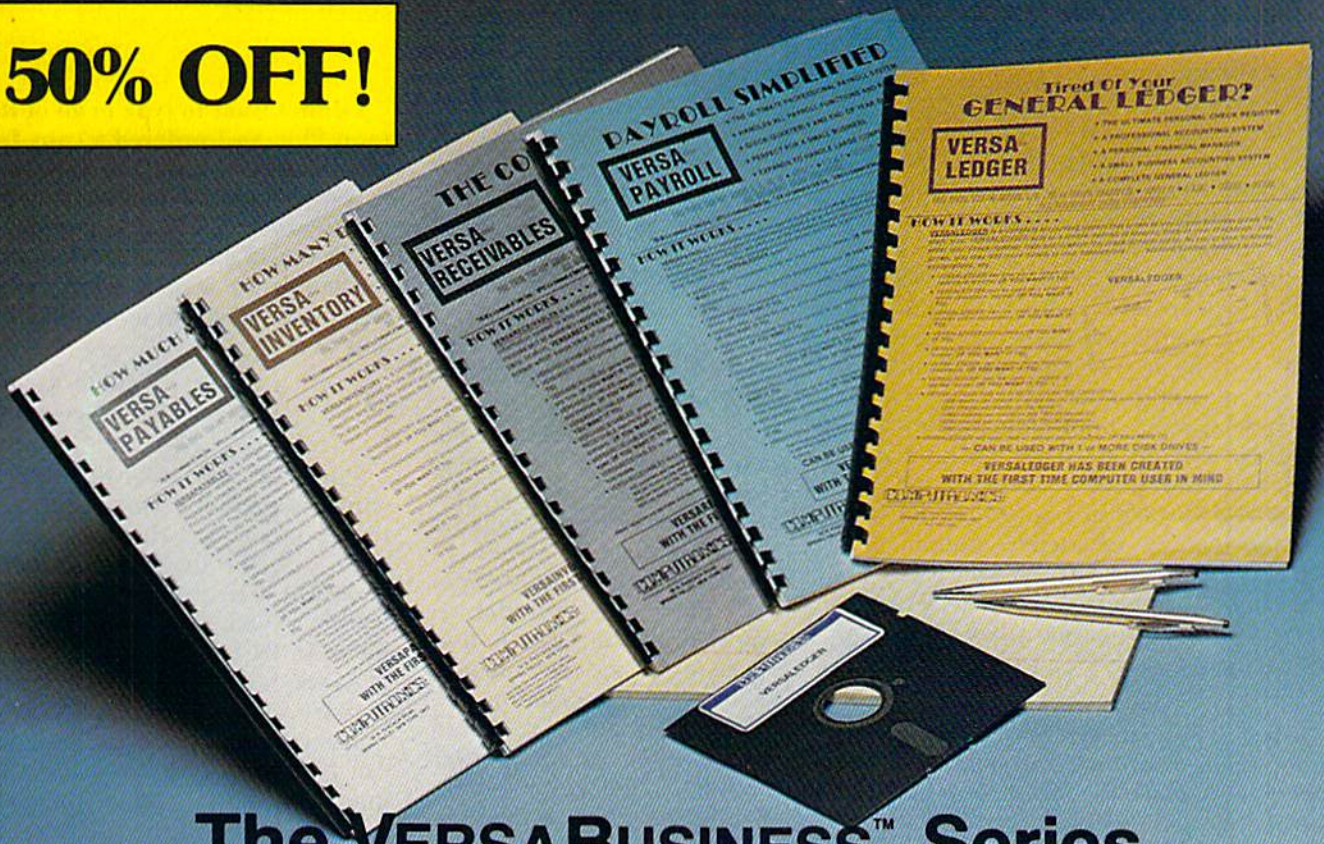
Basically, there are two types of online services: those that work with generic terminal programs and those that require a special, or *dedicated* program.

The first type of service includes most local bulletin boards and networks such as CompuServe, The Source and Delphi. These services will

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.

communicate with any terminal program that uses standard ASCII.

Viewtron, along with Quantum-Link, PlayNet, and bulletin boards using Punter protocols, belong in the second category of services. To access these, you must use a special terminal program supplied by the service.

The reason for this difference is that CompuServe and other services of the first type essentially treat all computer brands alike, sending them all the same codes. But Viewtron and others of the second type send special signals, which are specific for each computer or involve non-standard codes that a generic terminal program would not understand.

These special codes allow the integrated systems to send machine-specific color and graphics, and otherwise to take advantage of the unique features of each computer. All services of the second type provide their customers with the necessary terminal programs when they subscribe.

After typing in Runterm Plus in nine separate sittings, I used a copy program to move the incomplete file to another disk and used my original copy as a backup. I ran the program between sessions, but I just got some garbage on the screen; then the screen cleared, displaying the Ready prompt and the blinking cursor. Is there a bug in the program?

Hironobu Ozaki
East Lansing, MI

It's not a good idea to copy an incomplete file with any program other than ML Perfect Typist, since the copy program may change the file in some unpredictable way.

A better method would be to use ML Perfect Typist to load the incomplete file from one disk, then use Perfect Typist again to save it as an incomplete file to another disk. You will get the effect you describe if the computer tries to execute a zero byte (Break command), which tells it to clear the screen and display the Ready prompt.

Your problem has to do with the fact that Runterm Plus does not load like a Basic program. What probably happened is that during your copy process, the program was loaded into the start-of-Basic memory (location 2049) with

```
LOAD"RUNTERM PLUS",8
```

instead of

```
LOAD"RUNTERM PLUS",8,1
```

which will load the program into memory starting at location 2594, where the program must begin if it is to work properly.

What is a capture buffer and how does it work?

William Jefferson
San Francisco, CA

First, a buffer is any block of computer memory in which data is temporarily stored. Most terminal programs have a capture buffer, ranging from 3000 up to 40,000 bytes, in which you can store data as it comes in over the modem. This buffer remains empty until you open it, usually by pressing a key combination described in the documentation.

Incoming information is stored until you close the capture buffer (with another special key combination) and direct the terminal program to save the buffered information to disk, again by pressing a special key combination.

Most people use capture buffers to save information that otherwise would be lost as soon as you read it, such as conference conversations or bulletin board messages. After the on-line session is over, you have a permanent record that you can refer to at your leisure.

I am using a Total Telecommunications (Telelearning) package. The supplied terminal program dials from the keyboard; before dialing, it opens the phone line. How do I use your program with my modem to open the phone line?

Manh Huu Vu
Hamilton, Ontario
Canada

Runterm Plus doesn't have an automatic dialing routine, so you must use the telephone to dial the number. The procedure is to load and run the program with the Data/Voice switch set to Voice. Then dial the number you want. When you hear the other computer's carrier signal, move the switch to Data.

I didn't want to type in all of Runterm Plus, so I ordered a copy from you. However, I am not able to tell if you sent me the complete code or only Part 1. I am not getting the selections of different services as described in the article. What I'm getting is the copyright notice with your address.

Weldon Amerine
Newton, CT

The disk you received from me contains the full machine code. Since the program was divided into two parts, and the first part did not include the file transfer and network features, you don't see the main menu in Part 1.

At the beginning of Part 2 in the January issue, there are a series of Pokes that set up the program so it can be loaded just like a Basic program. The last Poke in this series activates Part 2 of the program. You must enter this last Poke in order to see the main menu and to use all the features of the program, whether you typed in the program or received a disk copy from me.

I am new to telecommunications and am learning a lot from your column. However, I don't really understand what downloading is or how to do it. I talked to some guys at my user's group, and they said programs have to be translated before you send them and then translated back before you can use them. Can you explain?

Jack Slovik
Pittsburgh, PA

Downloading is the process of having a remote computer transmit to your computer's disk drive a file containing either text or a program. Uploading is the opposite. Unfortunately, it's not a straightforward process.

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 gBASE, 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-45 Money Minder
C-46 Personal File Keeper
C-47 Personal Investment Manager
C-48 Family Tree
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
7124 Shady Oak Road
Eden Prairie, MN 55344

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 program(s) you wish to order and return this order form along with your check, money order or VISA/MasterCard information to: Firstline Software, 7124 Shady Oak Rd., Eden Prairie, MN 55344.

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____

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

5-86

What you described as translating and retranslating files is sort of outdated; things aren't that primitive anymore. In the early days of telecomputing, the technology was concerned only with sending text—the characters you see on a regular typewriter. These characters were represented by numeric codes, and any code that didn't represent a character was used as a control code, to format the data flow between computers.

Program commands, too, were numeric codes to the computer, and some of those program codes were the same as the formatting codes that computers used to transfer files.

This meant that before you could transmit a program through the modem, it had to be converted into character codes so the computer wouldn't confuse program commands with formatting codes. The person receiving the program would then have to retranslate it back into program codes before he could use it.

Programmers were understandably dissatisfied with all this data manipulation, and several procedures were developed to simplify and automate file transfers. Because each individual solves problems in a different way, we now have several transfer protocols that do more or less the same thing.

On some systems, such as CompuServe, you have a choice of several protocols. The system will let you choose the type of download, and you choose the one that's compatible with your terminal program. Look at your terminal program documentation to see which transfer protocol it uses.

If the remote system uses dedicated terminal software, as do Quantum-Link and Viewtron, then you don't have to concern yourself with protocols; the system takes care of all that.

In any case, when you download a file, you should be sure that your disk has enough room to store the complete file that you're about to receive. Also, you should store the file using a filename that isn't already used on the disk. The download process will automatically take the file from the remote computer and store it on your disk, ready to use.

The best way to become proficient at downloading is to study the documentation for your favorite network or bulletin board and try it repeatedly on short files from the download databases. Initially, you may want to use empty disks, so you won't corrupt any useful files if something disastrous happens.

And if you can't figure out the download method for one network or bulletin board, try other systems. The number of on-line services is growing rapidly, and quality and ease of use vary widely. Shop around. R

Address all correspondence regarding this column to: Robert Sims, Telecomputing Workshop, c/o RUN *Magazine, 80 Pine St., Peterborough, NH 03458.*

MOVING?

SUBSCRIPTION PROBLEM?

Get help with your subscription by calling our new toll free number:

1-800-227-5782*

between 9 a.m. and 5 p.m. EST, Monday–Friday.

If possible, please have your mailing label in front of you as well as your cancelled check or credit card statement if you are having problems with payment

If moving, please give both your old address and new address.

Circle 84 on Reader Service card.



Use your **Commodore 64** to improve your performance at the track! These fine programs for **Thoroughbreds, Harness Horses** and **Greyhounds** combine the power of your computer with the savvy of a veteran handicapper. Spend a few minutes entering data, and The Handicapper will rank the horses or dogs in each race. All the information you need is readily available from the Thoroughbred Racing Form, harness or greyhound track program. We even provide a diagram that shows you where to find it!

Horse racing factors include speed, class, past performance, post position, stretch gain, beaten favorite, jockey or driver's record, weight (for thoroughbreds) and parked-out signs (for trotters). **Greyhound factors** include speed, past performance, class, favorite box, kennel record, breaking tendencies, beaten favorite.

Instructions and wagering guide included. **Thoroughbred, Harness or Greyhound Handicapper,** only $34.95 each on tape or disk. Any two, just $54.95. All three only $74.95.

MasterCard

Federal Hill Software
8134 Scotts Level Rd.
Baltimore, MD 21208

VISA®

Toll Free (Orders Only) 800-245-6228
For Information Call 301-521-4886

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 near-letter-quality print. **emphasized** *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 $59.00** **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

Circle 15 on Reader Service card.

Commodore Software Sale

ORDER TODAY!

Name _____

Address _____

City _____ State _____ Zip _____

Visa/Mastercard No. _____

Exp. Date _____ Phone (_____) _____

(T) Tape, (C) Cartridge, (D) Disk.

GAMES

Accolade

5950 HARDBALL (D)	$29.95	$18.95
5952 LAW OF THE WEST (D)	29.95	18.95
5954 FIGHT NIGHT (D)	29.95	18.95
5956 PSI 5 TRADING CO. (D)	29.95	18.95
5958 THE DAM BUSTERS (D)	29.95	18.95

Activision

0757 RIVER RAID (D)	$39.95	$18.95
0761 PITFALL II — LOST CAVERNS (D)	39.95	18.95
0900 SPACE SHUTTLE (D)	37.95	18.95
0932 ON FIELD FOOTBALL (D)	39.95	18.95
0936 ON COURT TENNIS (D)	39.95	18.95
0940 GHOSTBUSTERS (D)	39.95	22.95
3580 GREAT AMERICAN RD. RACE (D)	29.95	20.95
3582 MASTER OF THE LAMPS (D)	29.95	20.95
3584 COUNTDOWN/SHUTDOWN (D)	29.95	20.95
3588 MINDSHADOW (D)	29.95	20.95
3590 STAR LEAGUE BASEBALL (D)	29.95	20.95
3592 ALCAZAR (D)	29.95	20.95
5196 LITTLE PEOPLE PROJECT (D)	34.95	24.95
5198 FAST TRACKS (D)	34.95	20.95

Broderbund

2900 MASK OF THE SUN (D)	$39.95	$23.95
2901 OPERATION WHIRLWIND (D)	39.95	22.95
2903 LODE RUNNER (D)	34.95	19.95
2904 THE CASTLES OF DR. CREEP (D)	29.95	18.95
2906 WHISTLERS BROTHER (D)	29.95	18.95
3039 STEALTH (D)	29.95	22.95
3041 RAID ON BUNGELING BAY (D)	29.95	18.50
2905 KARATEKA (D)	29.95	23.95
3038 CHAMPION LODE RUNNER (D)	34.95	26.95
5158 BANK STREET WRITER (D)	49.95	32.95
5330 BANK STREET SPELLER (D)	49.95	32.95
5332 BANK STREET FILER (D)	49.95	32.95
5334 BANK STREET MAILER (D)	49.95	32.95

Datasoft

3025 BRUCE LEE (D)	$34.95	$18.95
3026 PAC-MAN (D)	34.95	18.00
3027 MIGHTY CONAN (D)	34.95	18.00
3028 MR DO! (D)	34.95	18.95
3029 DIG DUG (D)	34.95	18.95
3032 POLE POSITION (D)	34.95	18.95
5216 ALTERNATE REALITY	39.95	25.95
5218 THE GOONIES (D)	29.95	18.95
5220 ZORRO (D)	29.95	18.95

Electronic Arts

3830 DR. J & LARRY BIRD (D)	$29.95	$23.95
3832 FINANCIAL COOKBOOK (D)	39.95	27.95
3834 MAIL ORDER MONSTERS (D)	34.95	22.95
3840 THE SEVEN CITIES OF GOLD (D)	29.95	23.95
3842 SKY FOX (D)	29.95	23.95
5176 CARRIERS AT WAR (D)	42.95	32.95
5178 REACH FOR THE STARS II (D)	37.95	28.95
5180 HEART OF AFRICA (D)	29.95	23.95
5182 MOVIE MAKER (D)	29.95	23.95
5184 EUROPE ABLAZE (D)	42.95	34.95
5186 M.U.L.E. (D)	19.95	16.95
5188 MURDER ON ZINDERNEUF (D)	19.95	16.95
5190 MUSIC CONSTRUCTION SET (D)	19.95	16.95
5192 PINBALL CONSTRUCTION SET (D)	19.95	16.95
5194 RACING CONSTRUCTION SET (D)	29.95	22.95

Epyx

0337 WORLD'S GREAT FOOTBALL (D)	$39.95	$23.95
0338 WINTER GAMES (D)	39.95	20.95
0339 THE EIDOLON (D)	39.95	20.95
0340 KORONIS RIFT (D)	39.95	20.95
0360 JET COMBAT SIMULATION (D)	39.95	20.95
0364 SUMMER OLYMPIC GAMES (D)	39.95	18.95
0365 WORLD'S GREAT BASEBALL (D)	34.95	20.95
0382 SUMMER OLYMPIC GAMES II (D)	39.95	20.95
0750 PITSTOP II (D)	39.95	22.95
2046 IMPOSSIBLE MISSION (D)	34.95	16.95
2066 ROBOTS OF DAWN (D)	39.95	15.95
2070 BARBIE (D)	39.95	18.95
2074 G.I. JOE (D)	39.95	18.95
2085 BREAKDANCE (D)	39.95	16.95
2305 SCRABBLE (D)	39.95	24.95
3004 CHIPWITS (D)	34.95	15.95
3005 BALLBLAZER (D)	29.95	24.95
3006 RESCUE ON FRACTALUS! (D)	29.95	20.95

Strategic Simulations, Inc.

2995 RDF 1985 (D)	$34.95	$20.95
2996 COMBAT LEADER (D)	39.95	23.95
2997 GEOPOLITIQUE (D)	39.95	24.95
2998 BALTIC 1985 (D)	34.95	20.95
3008 RINGSIDE SEAT (D)	39.95	23.95
3009 THE COSMIC BALANCE (D)	39.95	23.95
3010 IMPERIUM GALACTUM (D)	39.95	23.95
3011 CARTELS AND CUTTHROATS (D)	39.95	23.95
3012 RAILS WEST (D)	39.95	26.95
3013 TIGERS IN THE SNOW (D)	39.95	23.95
3014 PROFESSIONAL TOUR GOLF (D)	39.95	23.95
3015 50 MISSION CRUSH (D)	39.95	23.95
3016 PRESIDENT ELECT (D)	39.95	23.95
3017 BROADSIDES (D)	39.95	24.95
3018 COMPUTER QUARTERBACK (D)	39.95	24.95
3020 COMPUTER AMBUSH (D)	59.95	37.95
3021 COMPUTER BASEBALL (D)	39.95	23.95
3030 KNIGHTS IN THE DESERT (D)	39.95	23.95
3031 FIELD OF FIRE (D)	39.95	23.95

Suncom

3876 PARTY QUIZ (D)	$49.95	$14.95
3880 GENERAL EDITION (D)	39.95	14.95
3882 GENERAL EDITION III	39.95	14.95
3884 SPORTS EDITION (D)	39.95	14.95
3886 EDUCATION EDITION (D)	39.95	14.95
3888 BIBLE EDITION (D)	39.95	14.95

BUSINESS

Codewriter

0129 FILEWRITER (D)	$39.95	$29.95
0706 REPORTWRITER (D)	39.95	29.95
0707 ADVENTUREWRITER (D)	49.95	39.95
0708 ELF (D)	39.95	29.95
0709 DIALOG (D)	49.95	39.95
0784 MENUWRITER (D)	39.95	29.95
2550 SPEEDWRITER (D)	49.95	39.95
2551 HOME INTEGRATOR (D)	29.95	19.95

Softsync

5930 ACCOUNTANT, INC. (D)	$99.95	$64.95
5932 PERSONAL ACCOUNTANT (D)	34.95	26.95
5934 MODEL DIET (D)	29.95	23.95
5936 TRIO (D)	49.95	45.95
5938 KID PRO QUO (D)	29.95	23.95
5940 DESK MANAGER (D)	39.95	28.95

Timeworks

0176 INVENTORY MANAGE (D)	$69.95	$38.95
0180 ACCOUNTS RECEIVABLE/ INVOICING (D)	69.00	38.95
0182 ACCOUNTS PAYABLE/ CHECKWRITING (D)	69.00	38.95
0184 PAYROLL MANAGEMENT (D)	69.00	38.95
0188 GENERAL LEDGER (D)	69.00	38.95
0207 ELECTRONIC CHECKBOOK (D& T)	29.95	19.95
0231 MONEY MANAGER (D&T)	29.95	19.95
0235 DATA MANAGER (D&T)	29.95	19.95
0928 EVELYN WOOD SPEED READ (D)	69.96	32.95
3743 SYLVIA PORTER (D)	59.95	38.95

C128 Software From Timeworks

5022 WORD WRITER/ SPELL CHECKER (D)	$69.96	$59.95
5024 DATA MANAGER II (D)	69.96	49.95
5026 SWIFTCALC WITH SIDEWAYS (D)	69.96	49.95

Phone Orders

CALL 8 to 8 C.S.T. - M-F

312-382-5244

EDUCATION

American Educational Computer

2482 ELEM. SCIENCE FACTS (D)	$29.95	$14.95
2492 VOCABULARY WORD BUILD (D)	29.95	14.95
2493 GRAMMAR WORD SKILLS (D)	29.95	14.95
2494 WORLD GEOGRAPHY FACTS (D)	29.95	14.95
2495 SPANISH VOCAB. SKILLS (D)	29.95	14.95
2496 FRENCH VOCAB. SKILLS (D)	29.95	14.95
2497 WORLD HISTORY (D)	29.95	14.95
2498 U.S. HISTORY FACTS (D)	29.95	14.95
2499 BIOLOGY FACTS (D)	29.95	14.95
2519 U.S. GEOGRAPHY FACTS (D)	29.95	14.95
2520 U.S. GOVERNMENT FACTS (D)	29.95	14.95
2521 AEC SPELLING (D)	39.95	24.95
3745 PHONICS (D)	39.95	24.95
3747 LEARN TO READ (D)	39.95	24.95
3749 READING COMPRENSION (D)	39.95	24.95

Designware

0824 GRAMMAR EXAMINER (D)	$39.95	$24.95
0828 SPELLAKAZAM (D)	34.95	19.95
0832 STATES & TRAITS (D)	44.95	27.95
0836 SPELLICOPTER (D)	39.95	24.95
0840 CREATURE CREATOR (D)	34.95	19.95
0844 TRAP-A-ZOID (D)	39.95	25.95
2518 THE BODY TRANSPARENT (D)	44.95	27.95
2517 EUROPEAN NATIONS & LOCATIONS (D)	44.95	27.95
2062 MATH MAZE (D)	39.95	26.95
5100 ALGEBRA I (D)	39.95	28.95
5102 REMEMBER (D)	69.96	49.95
5104 WEBSTER'S NUMBERS (D)	39.95	28.95
5105 SPELLING & READ PRIMER (D)	39.95	24.95
5106 ALGEBRA 2 (D)	39.95	28.95
5107 ALGEBRA 3 (D)	39.95	28.95

Mindscape

5108 KEYBOARD CADET (D)	39.95	25.95
5110 BANK STREET MUSIC WRITER (D)	39.95	25.95
5112 CROSSWORD MAGIC (D)	49.95	29.95
5114 THE PERFECT SCORE (D)	69.96	45.95
5116 COLORME/RAINBOW BRITE (D)	34.95	18.95
5118 THE HALLEY PROJECT (D)	39.95	25.95
5120 INDIANA JONES IN THE LOST KINGDOM (D)	29.95	18.95
5122 BANK STREET STORYBOOK (D)	39.95	25.95
5910 THE DOLPHIN'S RUNE (D)	29.95	18.95
5912 THE LUSCHER PROFILE (D)	39.95	25.95
5914 QUAKE MINUS ONE (D)	29.95	18.95
5916 THE LORDS OF MIDNIGHT (D)	29.95	18.95
5918 SHADOWFIRE (D)	29.95	18.95

Weekly Reader

2511 STICKYBEAR BOP (D)	$34.95	$19.95
2512 STICKYBEAR NUMBERS (D)	34.95	19.95
2513 STICKYBEAR BASKETBOUNCE (D)	34.95	19.95
2514 STICKYBEAR OPPOSITES (D)	34.95	19.95
2515 STICKYBEAR ABC (D)	34.95	19.95
2516 STICKYBEAR SHAPES (D)	34.95	19.95
2600 PIC BUILDER (D)	29.95	19.95
5126 STICKYBEAR SPELLGRABBER (D)	29.95	19.95
5128 STICKYBEAR TOWN BUILDER (D)	29.95	19.95
5130 STICKYBEAR MATH (D)	29.95	19.95

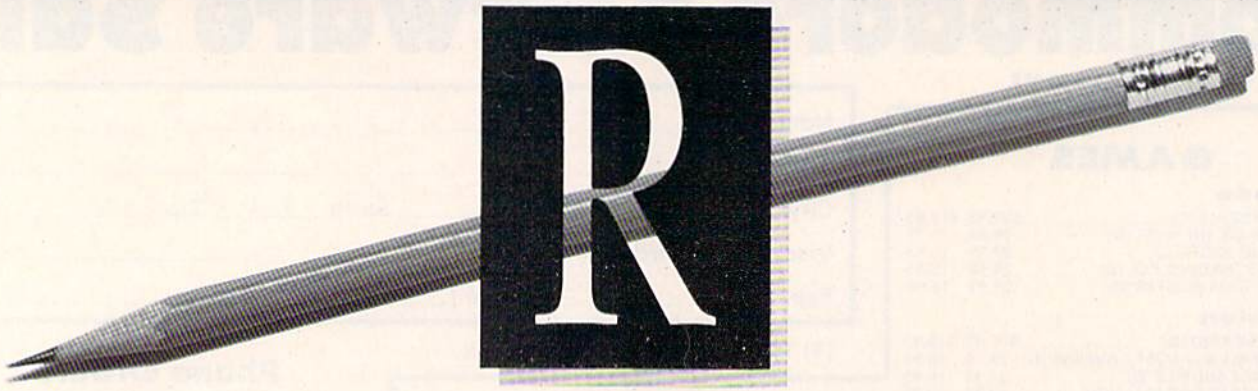
Add $3.00 for shipping, handling and insurance. Illinois residents please add 6¼% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. 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. No. C.O.D. to Canada, APO-FPO

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order



By MARGARET MORABITO

Educators are now bringing computers into fine arts departments. See how one college and one middle school are using C-64s in music courses and for administrative work.

In the 1970s, educators used the microcomputer primarily for teaching technically oriented computer science and engineering courses. Since then, the use of the microcomputer in education has broadened to the point where its impact is now felt in a wide range of non-technical areas.

Most microcomputers have features that make them useful in a variety of subjects, such as language arts, social studies, mathematics, history and foreign language study, to name a few. As long as the computer can handle text displays and some graphics, it can adequately handle software created for many of these courses.

In certain subjects, software requirements are more demanding. Educators in the creative and fine arts, for example, are gradually realizing the computer's potential to create graphics design and to produce sound. Music instruction, in particular, is an area in which computers are becoming more active.

From simple sound recognition to multi-voiced composition, the music curriculum demands special features from a computer, such as the ability to produce monophonic and polyphonic sounds, to handle high-resolution graphics and to operate attached MIDI instruments. Teachers are discovering that the C-64 is effectively designed to fill these requirements for music department course work.

The C-64 has a built-in sound synthesizer (the SID chip), which is capable of producing multi-voiced sounds, with up to three voices simultaneously. For large-scale sound output, you may attach external amplifiers and speakers to this computer, or you can use the speaker built into your video monitor. The C-64 also handles high- and low-resolution color graphics.

Furthermore, if you want to attach MIDI instruments to your C-64, for the study and production of more intricate musical arrangements and electronic sound, you may do so by purchasing a MIDI interface. Due to their low price, the built-in sound and graphics capabilities and the wealth of music software available for them, the C-64 and the C-128 are logical choices for computer-assisted instruction in music.

College Music Department

For the music department of Augustana College, in Sioux Falls, South Dakota, the C-64 has become a sound and multifaceted investment. It is used for music instruction in those courses that currently rely on drill and practice, and it has been a time-saver with administrative chores.

Two years ago, when the college created computer labs in each of its classroom buildings, Professor Walter May, Chairman of the Music Department, began to get familiar with the C-64. At that time, May knew nothing about computers nor how they could help him in his work, but, through the encouragement of the college administration and guidance from his son at home, he began to learn how to use the 64.

Says May, "I began to realize how useful it would be, not only for computer-assisted music instruction, but also in my administrative role as department chairman."

C-64 in the Music Curriculum

May uses C-64s in a music laboratory for his music fundamentals courses. At the beginning of the semester, he introduces the C-64 to his class, demonstrating how to use the system and its software. From then on, students use the music lab for regular assignments and practice.

The computer is specifically used for teaching the major and minor scales, all the major and minor key signatures, all the intervals and their inversions, and four types of triads and their inversions. It is also used for ear-training in general.

The computer "saves a lot of class time that used to be taken up with this kind of drill," relates May. "Now the students can do this on their own time and as often as they wish." Furthermore, the students enjoy the interaction with the computers. May has been able to document students' progress from drill to drill and claims that this computer-assisted instruction is effective.

The Software Involved

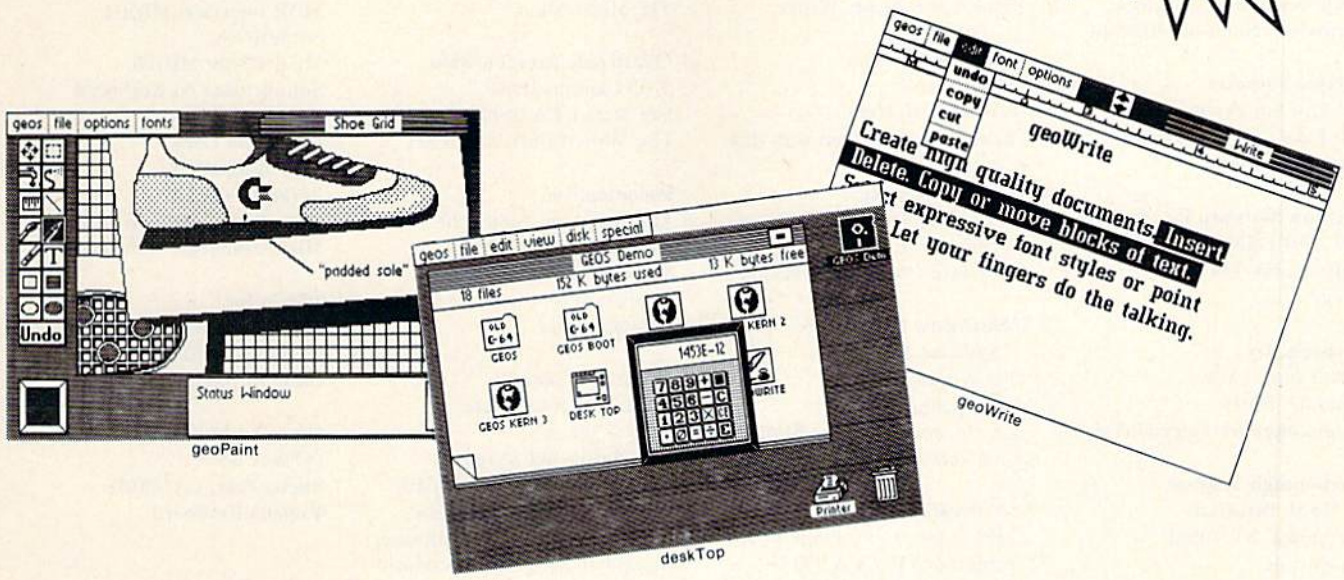
The music fundamentals class is for beginning music students who are

Circle 134 on Reader Service card.

GEOS™...

The fastest, easiest, most powerful way to use your C64!

NEW!



Graphic Environment Operating System

GEOS brings the power of a graphic interface to your C64. Icons, pull down menus and windows make creating and managing information easier than ever.

All your file handling is done on the **GEOS deskTop**. Load in any disk and view its contents as icons. If you like, sort the files alphabetically by name, or by the last time you modified them. It's up to you.

Want to edit a file? Copy or move it to another disk? Print or Delete it? Simply point at the icon or filename and then select a menu function.

File access is also dramatically improved. Seconds after selecting the icon on the **deskTop**, your GEOS application will be loaded and you'll be ready to work. That's because the integrated **diskTurbo** software improves 1541 disk drive performance 5 to 7 times (on both reads and writes!)

The high performance doesn't stop there. GEOS also includes two integrated applications. **geoPaint** is a full featured, easy to use graphic editor. Produce any number of high quality graphic images using the 14 different graphic tools and shapes. Paint or fill in 32 different patterns. Zoom in for pixel editing or display a preview of the full page. Add titles or snappy captions in different fonts, styles, or point sizes.

geoWrite is an easy to use, graphics based word processor. Insert, copy, move, or delete. Choose from five different fonts in several different styles and point sizes. Bring in a picture from geoPaint, if you like. Best of all, what you see on the screen is what you'll get in the final output. Compose, arrange and re-arrange for that picture perfect presentation.

There's also a few desk accessories, for that little extra help when and where you need it. Available from any **GEOS** application, they include an alarm clock, a notepad, a four function calculator, and photo and text albums (for collecting pictures and phrases to paste into other applications).

GEOS is the beginning of a "whole new world" of products for the C64. Watch for new applications.

$59.95

ORDER NOW!

800-443-0100 x234

GEOS Diskette includes deskTop, diskTurbo, geoPaint, and geoWrite $59.95. CA residents add 6.5% tax. ($4.50 US/7.50 Foreign shipping and handling.) US Funds only.

☐ Check or Money Order ☐ VISA ☐ Mastercard

Acct # _____ Exp. Date _____

Name _____

Address _____

City, State, Zip _____

Signature _____

Send to: Berkeley Softworks
Order Processing
PO Box 57135
Hayward, CA 94545

Allow 4-6 weeks for delivery

Commodore 64 and C64 are trademarks of Commodore Electronics, Ltd. GEOS, GEOS Desktop, geoPaint, geoWrite, diskTurbo, and Berkeley Softworks are trademarks of Berkeley Softworks.

***MECC**
3490 Lexington Ave. North
St. Paul, MN 55112
Pitch; Scales and Chords; Terms and Notation; Rhythm

***Access Software**
925 East 900 South
Salt Lake City, UT 84105
Master Composer

Artworx Software Co., Inc.
150 North Main St.
Fairport, NY 14450
Allegro

***Cyberia, Inc.**
2330 Lincoln Way
Ames, IA 50010
Commodore 64 Tutorial, Vol. 2

Scarborough Systems
25 North Broadway
Tarrytown, NY 10591
Songwriter

***Mindscape, Inc.**
3444 Dundee Road
Northbrook, IL 60062
Bank Street Music Writer

***Tech Sketch, Inc.**
26 Just Road
Fairfield, NJ 07006
Music Port Keyboard with disk

Valhala Software
205 E. Hazelhurst
Ferndale, MI 48220
Keyboard Chord/Scale Master

***Electronic Courseware Systems, Inc.**
309 Windsor Road
Champaign, IL 61820
Ear Challenger; Music Room; Clef Notes; Listen

***Activision, Inc.**
2350 Bayshore Frontage Road
Mountain View, CA 94043
The Music Studio

Broderbund Software
17 Paul Drive
San Rafael, CA 94903
The Music Shop

***Electronic Arts Software**
2755 Campus Drive
San Mateo, CA 94403
The Music Construction Set

Melodian, Inc.
115 Broadway, Suite 1202
New York, NY 10006
Melodian Keyboard with Concert Master software; RhythmMaster

***Sight and Sound Music Software, Inc.**
3200 S. 166th St.
New Berlin, WI 53151
Incredible Musical Keyboard; 3001 Sound Odyssey; Music Processor; Kawasaki Synthesizer; Computer Song Albums; Music Video Kit; Kawasaki Rhythm Rocker

Passport Music Software
625 Miramontes St.
Half Moon Bay, CA 94019
MIDI interface; MIDI/4 Soundware; MIDI/4 Plus; MIDI/8; Soundchaser 64 Keyboard

Waveform Corp.
1912 Bonita Way
Berkeley, CA 94704
ColorTone Keyboard with disk; MIDI connector with disk

***Casio Inc.**
15 Gardner Road
Fairfield, NJ 07006
Casio Keyboard

***Yamaha International/Corp.**
PO Box 6600
Buena Park, CA 90620
Yamaha Keyboard

Table 1. *List of music software, keyboards and MIDI equipment for the C-64. Asterisks indicate the manufacturers of products mentioned in this column.*

considering becoming music majors, but who never received training in the rudiments of music prior to attending college. This training uses several software packages published by MECC (Minnesota Educational Computing Consortium): Pitch, Scales and Chords, Terms and Notation, and Rhythm. The goal is to remedy students' deficiencies in basic music concepts, so that they can enter the regular theory course sequence with others who have had previous training.

The Pitch program is used because it offers useful drills for learning to recognize intervals and conceptualize pitches. There are four modules in this program, and it's used more than the other three from MECC because of its slant toward college-level students. The other programs are used only in select cases, as they're intended for more elementary-level students.

May also relies on software from Electronic Courseware Systems, Inc. He has purchased four programs from this firm: Ear Challenger, a game involving tonal memory; Music Room, a tuning exercise involving the matching of pitches; Clef Notes, a drill program for learning the alto and tenor clefs; and Listen, a review of intervals, triads and seventh chords.

He uses Clef Notes in his advanced theory class, which requires the writing of musical scores using treble, alto, tenor and bass clefs. The other programs are used in the music fundamentals course.

For those classes requiring a lot of factual knowledge of the music associated with particular composers, styles, periods and countries, May creates his own study materials. He uses Commodore's Easy Quiz and Easy Lessons to make multiple-choice study aids, which are used by students as they review for tests.

Additional Uses of the C-64

For May, the C-64's value goes beyond the music lab. To keep track of students' grades in each course, May uses a program called Master Grades, from Midwest Software. He's able to keep one year's grades on a single disk, providing a quick determination of current grade averages and a printed summary of grades at any time.

One of his most valued applications is Spinnaker Software's Better Working Spreadsheet, which keeps the current and comprehensive student records that he needs for his duties as academic advisor. He sets up the spreadsheet so that he can easily show a student his or her current status in the degree program and demonstrate the effect of improved performance in certain areas. At the end of an advising session, he gives each student a printout of his or her record.

May also uses Midwest Software's The Bottom Line to handle several large budgets. Business correspondence is done with Easy Script and a Silver Reed letter-quality printer. When planning trips for the college, May uses a program called Roadsearch Plus (Columbia Software) to pin down the details of the trip.

Meeting the needs of both music in-

BACK ISSUES

January 1985—Create Your Own Games. How to select the right printer. Valuable disk tips for beginners.

February 1985—Joysticks: which ones to buy and how to use them in your own programs. Learn how to start a Commodore user's group. Fly the Grand Canyon with your VIC.

March 1985—Shape Up with Your C-64: reviews of fitness and nutrition programs. Mini-Calc spreadsheet and Money Manager programs. Word processors reviewed.

April 1985—First installment of assembly language series. Easy-to-use scroll subroutine. Simon's Basic. Build your own computer sanctuary.

May 1985—First-hand look at the new C-128. Keep track of your electricity expenses. Introducing a new series on telecommunications. Datafile Update.

June 1985—Making music on the C-64. Comparative review of the C-128. Prescriptions for your disks problems. Turn your C-64's eight function keys into 12.

July 1985—High Performance Turtle. Datafile Fast Print. Adjust your drive's motor speed. Align your disk drive. Basic 4.5.

August 1985—Two articles on the 1541 disk drive. PlayNet and PeopleLink. Byte-Size Compiler. C-64 Screen Formatter.

September 1985—Meet the Amiga. Interview with Commodore's Manager of Educational Marketing. Reviews of SAT Programs. *RUN*'s checksum program.

October 1985—Hi-res drawing program. Sprite editor. E-Mail Terminal. Combine creative designs with serious applications and text.

November 1985—Print both low- and high-resolution screens. Datafile Restructure Utility. Hardware Buyer's Guide. Eliminate your Data statement errors. Create your own tailored wedge.

December 1985—Comparative review of popular modems. Part 1 of a professional-quality terminal program. Machine language checksum program. C-128 checksum program. Datafile Structure Utility. Software Buyer's Guide, Part 1.

RUN

Each month RUN also brings you regular columns, reviews, programs and tutorials to help you get the most enjoyment and use out of your Commodore system.

Each back issue costs $3.50 plus $1 for shipping and handling. On orders of 10 or more back issues, there is a flat $7.50 shipping and handling fee. Quantities are limited and we cannot guarantee that all back issues are available. Send your orders to *RUN*, Attn: Back Issue Orders, 80 Pine St., Peterborough, N.H. 03458.

Circle 66 on Reader Service card.

FREE SHIPPING*

SOFTWARE DIMENSIONS

WE WILL MATCH ANY PRICE ADVERTISED IN THIS ISSUE

Calls originating outside Colorado **1-800-826-2447** Pacific time zone may call 6 am-8 pm

Calls originating inside Colorado **1-800-222-0697** Eastern time zone may call 9 am-11 pm

7830-A North Academy Blvd., Colorado Springs, CO 80918

COMMODORE

BUSINESS	
Superbase 64	$51.96
Back To Basic GL	61.75
Back to Basic GL, AR, AP	126.75
Data Manager II	32.46
Swiftcalc With Sideways	45.46
Electronic Checkbook	16.21
Sylvia Porter Financial Planner	38.96
Better Working Spreadsheet	32.46
EDUCATION	
Body Transparent	$29.21
Basket Bounce	19.46
Blazing Paddles	22.72
Charlie Brown's ABC's	19.46
Build A Book	25.96
Kids On Keys	19.46
Kidwriter	17.52
Mastertype	25.96
Rhymes & Riddles	13.62
SAT Algebra	25.96
SAT Practice Tests	12.96
Snooper Troops #1	17.52
Snooper Troops #2	17.52
Spell It	32.46
Spellagraph	25.96
Spellakazam	19.46
Word Challenger	12.96
Reader Rabbit	25.96
Moptown Parade	25.96
Math Blaster	32.46
Word Attack	32.46
Stickybear ABC's	19.46
Stickybear Numbers	19.46
Stickybear Opposites	19.46
Typing Tutor III	25.96
Creature Creator	19.46
Grammar Examiner	29.21
Mission Algebra	29.21
Spellicopter	25.96
Addition Magician	22.71
Speed Reader II	45.47
Peanuts Maze Marathon	19.46
Snoopy's Writer	25.96
Alphabet Zoo	19.46
Facemaker	13.62
Kindercomp	13.62
Story Machine	16.22
Trains	17.52
Agent U.S.A.	19.47
Turtle Tracks	19.47
Stickybear Bop	19.47
Stickybear Spellgrabber	19.47
GAMES	
Cutthroats	$25.96
Deadline	32.47
Donald Duck's Playground	25.96
Enchanter	22.72
Expedition Amazon	19.47
F-15 Strike Eagle	22.72
Flight Simulator II	32.47
Ghostbusters	22.72
Adventure Construction Set	25.96
Hitchhiker's Guide	22.72
Realm of Impossibility	16.22
Infidel	29.22
Kennedy Approach	22.72
Lode Runner	22.72
Mickey's Space Adventure	25.96
One-On-One	25.96
Pinball Construction Set	16.22
Sorcerer	25.96
Skyfox	21.42
Stellar 7	19.47
Suspect	29.22
Tycoon	19.47
Ultima II	38.97
Ultima III	38.97
Ultima IV	38.97
Winnie The Pooh	25.96
Wishbringer	22.72
Witness	22.72
Zork I	25.96
Zork II	25.96
Zork III	25.96
Planetfall	22.73
Seastalker	22.72
Suspended	29.22
Archon	16.22
Archon II Adept	21.42
Carriers At War	32.47
Europe Ablaze	32.47
Mail Order Monster	21.42
Music Constructor Set	16.22
Racing Destruction	21.42
Reach For The Stars	29.22
Seven Cities of Gold	21.42
Software Golden Oldies	19.47
The Eidolon	26.00
Impossible Mission	22.75
Jet Combat Simulator	19.47
Rescue On The Fractalus	25.96
Summer Games	26.00
Summer Games II	25.96
Winter Games	26.00
World's Greatest Baseball	22.75
World's Greatest Football	26.00
Acro Jet	22.72
Silent Service	22.72
Solo Flight	22.72
Crusade In Europe	25.96
Decision In The Desert	25.96
Micro League Baseball	25.96
Jet	32.47
Hacker	19.47
Millionaire	19.47
HOME	
Print Shop	$29.22
Graphic Lib. #1	16.22
Graphic Lib. #2	16.22
Bank Street Writer	32.47
Homeword	31.85
Paperclip	38.97
Paperclip With Spellchecker	51.97
Print Shop Paper Pack	12.97
Home Accountant	48.72
SuperScript/128	64.97
PFS File	51.97
Microsoft Multiplan	40.63
Homeword With Speller	45.47
Homeword Speller	22.72
Home Inventory	12.97
Mail List	12.97
PROGRAMMING LANGUAGE	
Logo	48.07
Simon's Basic	32.47
Kyan Pascal	45.47
UTILITIES	
Copy II 64	23.00
Fast Load	26.00
Magic Paintbrush	22.72
Picture Builder	25.96
Shapes & Fonts	13.00
Graphics Magician	25.96
Master Modem	38.97

Call For Daily Specials

Call Toll Free to place your order Monday–Saturday

- Free UPS ground shipping on orders of $40 and up. For two day air shipment add $7. Next day air add $10.
- Free Air Service on Orders Over $300.
- VISA MASTERCARD & AMERICAN EXPRESS
- For C.O.D.'s add 2% – minimal service charge is $3.
- Company & school administration purchase orders accepted upon approval
- Personal & company checks will delay shipping 2 weeks
- Prices & availabilities subject to change without notice.
- We do not guarantee machine compatibility

ALL SALES FINAL

Customer Service (303) 599-5935



Photo 1. Eighth grade students at LaVenture Middle School explore the world of electronic music through the C-64.

struction and administrative tasks, the C-64 helps in all areas of Professor May's work.

Middle School Music Project

The LaVenture Middle School in Mount Vernon, Washington, is also using C-64s in its music department, but with a slightly different focus: electronic music. The school has a long history of music education and has taught a unit on electronic music for 15 years. Harry Weldon, the Music Coordinator and a 25-year veteran music teacher, is currently piloting a new project involving music and computers with the eighth-grade students.

Weldon feels that the computer can be integrated into the entire music curriculum. He has found it well-suited for teaching basic music skills, composition, pitch recognition and ear training, as well as for drill and practice.

The goal of the school's music program is to broaden the students' perspective to include a knowledge of many different areas of music. "Electronic music provides an excellent way to do this," states Weldon. "Computers are 'in' with the students, and they have an eager interest to see how they may be used."

Weldon uses a wide range of music software in combination with traditional tools, such as tape recorders and audio-visual aids, to spark the interest of his students and to lead them from the basics through more advanced electronic music concepts.

An Overview of Weldon's Course

Weldon begins the course by introducing his students to the sounds of electronic music. They listen to and analyze the Electric Light Parade, from Walt Disney Productions, as well as Dripsody. Out of this experience, he makes the point that the composer of electronic music can use the computer to do his work more easily and rapidly.

To develop basic concepts about sound and music, the class first experiments with a variety of sounds and noises produced by tuning forks and instruments, and then with electronically produced sounds. A program called 3001: A Sound Odyssey, from Sight and Sound, provides the students with an introduction to the concepts of electronic music, as well as tutorials and hands-on sessions for studying each of the properties of sound: pitch, duration, volume and tone color. Another program used for this is the Commodore 64 Tutorial, Volume 2, from Cyberia, Inc.

In the beginning, all of the course work is done in class using one computer and multiple screens. According to Weldon, "The RF output of the C-64 makes this very easy to set up." Only after the students have a good working background of music concepts and the computer do they move into the school's electronic music lab.

As the course proceeds, the class learns about synthesizers and their capabilities. This is where the computer is used extensively for hands-on training. The class uses Music Port (Tech Sketch), The Incredible Musical Keyboard (Sight and Sound) and both the Yamaha and Casio keyboards.

Eventually, students are introduced to composition programs including 3001 and Kawasaki Synthesizer (Sight and Sound), The Music Construction Set (Electronic Arts), Master Composer (Access Software), Bank Street Music Writer (Mindscape) and The Music Studio (Activision).

The success of the school's electronic music program is due partly to the popularity of the C-64 and C-128. Most students have these computers at home and thus can easily follow up on their classwork. They can also contribute to the school's lab by bringing in their own joysticks and other peripherals. Although this school could choose from a variety of computers, it chose the C-64 to begin the project, partly because so many students were already familiar with the C-64 but mainly, as Weldon says, "because of the outstanding features of the SID chip."

Thank You

Walter May and Harry Weldon are taking important steps by introducing computers into their courses. Their experiences can provide a clearer path for others who want to learn more about how to integrate

the computer into the areas of music instruction and administrative work. I'd like to thank both of these educators for so readily contributing their experiences and time to this installment of The Resource Center.

I welcome responses from those of you who are using C-64s, VIC-20s or C-128s for educational purposes.

Tips from Teachers

In response to the February Resource Center on networking, some educators wrote offering tips about how to overcome lockup problems when employing multiuser switches.

L. Benado, of Russell Sage Junior High School in Forest Hills, NY, writes, "The problem of lockup is a major one. All too often a student will lose many hours of work because his program will not save. Many times two students' programs become intermixed, and the saved program is worthless. We knew this was a problem we had to live with, but that didn't make the student feel any better when it happened. Lockup could happen at any time, not just when more than one computer was accessing a peripheral simultaneously. A solution that sometimes works is to disconnect the power cord from the VIC Switch and then reconnect it."

Curt Cardine, from the Winchester Elementary School in Winchester, NH, offered this advice: "*RUN*'s 1985 Special Issue published a Magic trick that works extremely well with a networking error. By typing

```
POKE 144,0
```

and pressing the return key, most Device Not Present errors can be cleared up. Sometimes the students have to enter this Poke number twice before it works, but it usually works well. Another trick is to turn the printer off and on again; this resets the switch." R

If you are using Commodore computers for educational purposes (at home or in 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 you're involved in, the grade level or age of your students, software that has been effective and any other information you feel like including. Send letters to:

Margaret Morabito
c/o The Resource Center
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).

Circle 132 on Reader Service card.



NEW UPDATED DISK NIBBLER VERSION 2.1

FOR COMMODORE 64 and 128 (in 64 mode)

- Copies 70 new 1985 disks not copied by the original ULTRABYTE DISK NIBBLER
- Copies 30 more disks than NIBBLER V2.0
- Copies 99 + % of protected software

NIBBLER V2.1 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

(Dual drive Nibblers are not quite as powerful)

$ 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 V2.1 for $20.00 plus $4.00 shipping. Owners of V2.0 may have their disk updated to V2.1 by returning the original V2.0 disk with $10.00 plus $4.00 shipping. Foreign add $2.00. No COD's on updates

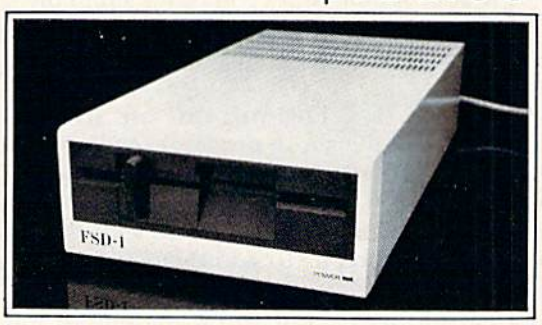
To order, write or call 24 hr. order line
For information, write. Phone for orders only

ULTRABYTE (818) 796 - 0576
P.O. Box 789 LaCanada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED

Circle 156 on Reader Service card.

Commodore Compatible and only $139.00



FSD-1 5¼" Disk Drive

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.

Special Features

- Full 6 month warranty.
- Slim line construction (low profile).
- All metal vented chassis.
- Solid state power supply.
- Dual serial port with chaining option.
- 5¼ inch industry standard format.
- Positive lever lock (eliminates "pop out" problem).

To order call toll free 1-800-356-5178

Visa and Mastercard are welcome. Allow $5.00 shipping and handling. Or mail your order with check or money order to:

ECI

Emerald Components Inc.
541 Willamette Street
Eugene OR 97401
Tel. 503-683-1154

From p. 10.

A large bulletin board display reminds children of the mnemonic and assures safe powering procedures in our computer lab.

Elaine Buckshaw
Holbrook, NY

$2E9 Line-editing tips—When changing Basic program lines, here are some things to keep in mind.

1. As long as the cursor is on the altered line when you press the return key, the line will be entered into the program. You needn't move the cursor to the end of the line.

2. You can duplicate a line in the program by listing it, typing a new line number over the old one, then pressing return. The new line number will be added to the program, and the old one will remain as it was.

3. Before you press the return key, you can easily discard your changes by pressing shifted return or by moving the cursor off the line in question. The line will remain in memory in its uncorrected state.

4. If you want to replace one line with another while retaining the option of restoring the original line, insert a REM statement in the original line, just after its number. Then give the replacement a line number that is a small offset of the original. You can later undo your work by removing the REM and deleting the second line.

5. If you want to move a group of lines from one program to another, load the first program and list the lines you want to move on the screen. Then, without disrupting the screen, load the second program, move the cursor to each of the listed lines and press the return key. The first program's lines will be added to the second program. If the line numbers interfere with those in the second program, you can change them before pressing the return key.

6. If you have a C-128, you can use its two-screen capability to make the above process even better. List the desired lines to the 80-column screen, then use ESC X to return to 40-column mode. The lines will stay on the 80-column screen no matter what you do with the program or the 40-column screen. To add them to your program at any time, use ESC X to move to 80-column mode, then put your cursor on each line you wish to move and press the return key.

J. C. Vollmer
Prior Lake, MN

$2EA Keyboard lock/unlock—Sometimes, usually when garbage has been printed to the screen, the shifted Commodore key won't switch your computer between Text and Graphics modes. (Naturally this always happens when you're in the mode you don't want to be in.)

You can correct the situation by holding down the CTRL key and pressing I. This is equivalent to printing a CHR$(9), the character that unlocks the mode switch. You can lock the mode as well, by pressing CTRL-H, which is the same as printing CHR$(8).

Scott Duncan
Superior, NE

$2EB C-64 screen blanking—When the C-64's screen is blanked, the border color temporarily covers the entire face of the monitor, and processing speed increases slightly. The real screen is still active and can be printed to or Peeked in the normal way. You can even use it for dynamic keyboard activities, and no observer will see what's going on.

To blank the screen, you can enter:

```
POKE 53265,PEEK(53265) AND 239
```

To return it to normal, just enter:

```
POKE 53265,PEEK(53265) OR 16
```

Location 53265 is also used to enable bit map graphics, extended background color mode and several other exotic modes. If your program doesn't use any of them, the Pokes become much simpler. To blank the screen, use:

```
POKE 53265,11
```

To return it to normal, use:

```
POKE 53265,27
```

Since very few programs use the exotic graphics modes, these simpler Pokes will almost always work.

Sue Dohnim
Apenna, ME

$2EC C-64 text-color change—This has been needed for years. It instantaneously changes the color of all text already printed on the screen.

```
50 POKE 648,224 : POKE 53281,A : PRINT " {COLOR A}
   {SHFT CLR} "
60 POKE 648,4 : POKE 53281,B : PRINT " {COLOR C} "
```

A is the Poke value for the color you want the text to become. Color A is that color's corresponding key; B is the Poke value for the screen color you want when the routine is finished; and C is the key for the text color you want active at that time.

The routine works with all known ROM versions and with the C-128 in C-64 mode. It resets the screen line links, which may occasionally cause minor troubles. The overall effect may be more pleasing if you blank the screen while the routine is being executed.

Louis F. Sander
Pittsburgh, PA

$2ED Improving background color changes—Many C-64 programs let you select the background color of your screen. But when you change it to the character color, you cannot see the printed text. This subroutine avoids the problem, taking advantage of the fact that white letters show up well on all colors except white. When the subroutine is called, the background color advances by 1. The cursor color remains white, unless the background is white. In that case, the cursor turns black. When the background changes again, the cursor returns to white.

A demonstration routine is included to illustrate the system. When used in conjunction with the above text color change routine, this subroutine can ensure that preexisting text never becomes invisible.

```
3Ø REM BACKGROUND CHANGE DEMO ROUTINE
4Ø PRINT"PRESS A KEY TO CHANGE COLORS{CRSR
   DN}"
5Ø GETA$:IFA$=""THEN5Ø
6Ø GOSUB11Ø : REM CHANGE BKGD COLOR
7Ø POKE53281,BC:POKE646,CC:PRINT"BKGD";BC,"
   CHAR";CC
8Ø GOTO5Ø
9Ø :
1ØØ REM BACKGROUND CHANGE SUBROUTINE
11Ø BC=PEEK(53281)AND15:CC=PEEK(646)
12Ø BC=(BC+1)AND15:CC=1AND(CC<>BC)
13Ø RETURN
```

Dee Plume
Nome, AK

$2EE Filename extensions—Do you wonder why some people end filenames with a period and three letters? Music filenames, for example, commonly end in .MUS, while files for downloading often have names ending in .IMG, or something similar.

The practice is common in computers using disk operating systems like CP/M and IBM's PC-DOS. Filenames in these operating systems are limited to eight characters, compared to Commodore's 16. In addition to its name, such a file can have an optional "extension" of up to three characters, separated from the filename by a period.

When the operating system lists such a file in a directory, it uses spaces to pad the filename to eight characters, then it prints another space and the extension. When searching for files, it treats the extensions as different from the filenames, so you can, for example, search for all files whose extension is BAS. This feature makes it useful to group similar files by giving them similar extensions, and this is the practice that is sometimes carried over into Commodore work.

But in Commodore's DOS, of course, there's no such thing as a separate extension. You can't search on it, and, because of the 16-character limit for filenames, you don't really need it. In fact, if you want to emulate such an extension, it's best to put it at the *beginning* of the filename, where it can be searched for by using the wild-card characters.

So, if you're tempted to tack a period and three letters onto the end of your filenames, try to resist the temptation. If you *can't* resist it, try putting them up front where you can use them.

Lucy S. Terrier
Alton, IL

Circle 254 on Reader Service card.

Software Discounters of America

SD 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		Fast Load Partner (D)	$23	Homework Helper	Call
Basic 128	Call	Koronis Rift (D)	$25	Monster Voyage (R)	$9
Super C 128	Call	Multiplan 64 or 128	$39	Story Machine (R)	$9
Super Pascal 128	Call	Summer Games II (D)	$25	**SPRINGBOARD**	
ACCESS		The Eidolon (D)	$25	Graphics Expander for Print Shop (D)	$25
Beach Head 2 (D)	$24	Winter Games (D)	$25	Newsroom (D)	$33
Leader Board Golf (D)	$25	**GAMESTAR**		N.R. Clip Art #1 (D)	$19
Mach 5 (R)	$23	On-Field Football (D)	$19	N.R. Clip Art #2 (D)	$25
Mach 128 (R)	$33	Star-Rank Boxing (D)	$19	Stickers (D)	$23
ACCOLADE		**HAYDEN**		**SSI**	
Dambusters (D)	$19	Sargon 3 (D)	$33	Battalion Commander (D)	$25
Fight Night (D)	$19	**INFOCOM**		Battle Group (D)	$37
Hardball (D)	$19	Ballyhoo (D)	$25	Colonial Conquest (D)	$25
PSI-5 Trading Co. (D)	$19	Cut Throats (D)	$23	Computer Ambush (D)	$37
ACTIVISION		Enchanter (D)	$23	Computer QB (D)	$25
Alter Ego-Male (D)	$33	Hitchhiker's Guide to the Galaxy (D)	$23	Field of Fire (D)	$25
Gary Kitchen's Gamemaker (D)	$25	Invisiclues	Call	Gemstone Warrior (D)	$23
Hacker (D)	$19	Planetfall (D)	$23	Kampfgruppe (D)	$37
Road Race (D)	$19	Spellbreaker (D)	$29	NAM (D)	$25
ARTWORX		Wishbringer (D)	$23	Phantasie (D)	$25
Bridge 4.0 (D)	$16	Zork 1 (D)	$23	Phantasie 2 (D)	$25
International Hockey (D)	$19	Zork 2 or 3 (D)	$25	Questron (D)	$25
Strip Poker (D)	$21	**KOALA**		Rings of Zilfin (D)	$25
Data Disk #1 female	$16	Light Pen w/Painter (D)	$35	Wizards Crown (D)	$25
Data Disk #2 male	$16	Muppet Learning Keys (D)	$29.95	**SUBLOGIC**	
Data Disk #3 female	$16	Touch Tablet w/ Painter (D)	$39	Flight Simulator 2 (D)	$32
AVALON HILL		Koala Printer (D)	$16	Jet (D)	$29
Super Bowl Sunday (D)	$21	**LEARNING COMPANY**		Scenery Disks	Call
S.B.S. Champs Disk	$14	All Titles Available	Call	**TIMEWORKS**	
Tournament Golf (D)	$19	**MASTERTRONIC**		Data Manager 2 (D)	$33
BATTERIES INCLUDED		5-A-Side Soccer (D)	$9	Data Manager (128)	$43
Consultant 64 or 128	$39	The Slugger (D)	$9	Evelyn Wood Dynamic Reader (D)	$33
Paperclip w/Spell 64 or 128	$49	**MICROLEAGUE**		Partner 128	$39
BERKELEY SOFTWORKS		Baseball (D)	$25	Sideways 64 or 128	$19
Geos (D)	$39	General Manager (D)	$25	Swiftcalc/ Sideways (128)	$43
BRODERBUND		1985 Team Disk	$16	Sylvia Porter's Personal Financial Planner (D)	$39
Print Shop (D)	$26	**MINDSCAPE**		Sylvia Porter's Personal Fin. Planner 128	$43
P.S. Companion (D)	$25	Color Me: The Computer Coloring Kit (D)	$19	Wordwriter w/ 85,000 Speller (D)	$33
P.S. Graphics Library #1 #2 or #3 (D)	$16 Ea.	Halley Project (D)	$19	Wordwriter w/85,000 Speller (128)	$43
CARDCO		Lords of Midnight (D)	$16	**TRONIX**	
Freeze Frame (R)	$33	Perfect Score SAT (D)	$44	S.A.M. (D)	$39
G-Wiz Pr. Interface	$47	Quake Minus One (D)	$16	**UNISON WORLD**	
S'More (R)	$47	Shadowfire (D)	$16	Art Gallery 1 (D)	$16
CBS		**MISC.**		Print Master (D)	$23
Argos Expedition (D)	$9	Book of Adv. Games 2	$16	**ACCESSORIES**	
Dr. Seuss (D)	$9	CSM 1541 Align. Kit (D)	$29	Bonus SS, DD	$6.99 Bx
Ernie's Big Splash (D)	$9	Copy 2 (D)	$23	Bonus DS, DD	$7.99 Bx
Grover's Animal Adv. (D)	$9	Firebird Elite (D)	$19	Compuserve Starter Kit	$19
Mastering the SAT (D)	$44	Gato (D)	$19	Datashare Printer Int. w/Graphics	$33
Math Mileage (D)	$9	Karate Champ (D)	$23	Disk Case (Holds 50)	$9
Success w/Algebra	Call	Kung Fu Master (D)	$23	Disk Drive Cleaner	$9
Success w/Math	Call	Snapshot 64 (R)	Call	Dow Jones News Retrieval Kit (5 hrs.)	$14
Weather Tamers (D)	$9	Spy vs. Spy 2 (D)	$19	Total Auto Answer/ Auto Dial Modem w/Software	$24.88
DATASOFT		Superbase 64 (D)	$47	Sakata 13" Color Composite Monitor for C64 w/cable	$149
Alternate Reality (D)	$25	Superbase 128	$59	Wico Bat Handle	$17
Bruce Lee (D)	$19	Superscript 128	$47	Wico Boss	$12
Never Ending Story (D)	$19	Vizastar 128	Call	Universal Printer Stand	$16
The Goonies (D)	$19	Vizawrite 128	Call		
DAVIDSON		**ORIGIN**			
Math Blaster (D)	$33	Ultima 3 (D)	$34		
Word Attack (D)	$33	Ultima 4 (D)	$39		
ELECTRONIC ARTS		**PROFESSIONAL**			
Adv. Const. Set (D)		Fleet System 2 64 or 128	$39		
Archon II: Adept (D)		Fleet System 3 (128)	$49		
Heart of Africa (D)		**SCARBOROUGH**			
Movie Maker (D)		Build A Book (D)	$17		
Music Const. Set (D)		Mastertype (D)	$23		
One-on-One (D)		Net Worth (D)	$44		
Pinball Const. Set (D)		**SIMON & SCHUSTER**			
Seven Cities Gold (D)		Great Int'l Airplane Construction Kit (D)	$19		
Skyfox (D)		Star Trek-The Kobayashi Alternative (D)	$26		
Super Boulder Dash (D)		Typing Tutor 3 (D)	$26		
Touchdown Football (D)		**SPINNAKER**			
Prices too low to advertise!!	Call	Adventure Creator (R)	$9		
EPYX		Alphabet Zoo (R)	$9		
Fast Load (R)	$23	Cosmic Combat (R)	$9		

MODEM OWNERS: Have you seen our online catalog of over 700 software titles for Commodore, Atari & Apple Computers? It's on Compuserve's Electronic Mall—Just type GO SDA and shopping for software will never be the same again!

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**—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.

From p. 38.

Listing 1 continued.

```
2Ø49 DATA36,76,Ø,Ø,56,73,255,1Ø5    :REM*1Ø3
2Ø5Ø DATAØ,96,32,246,36,24,165,25Ø :REM*16Ø
2Ø51 DATA1Ø5,8Ø,133,25Ø,144,2,23Ø,251
                                    :REM*1Ø1
2Ø52 DATA96,32,1Ø,37,56,165,25Ø,233 :REM*7Ø
2Ø53 DATA8Ø,133,25Ø,176,2,198,251,96
                                    :REM*241
2Ø54 DATA32,231,36,14,223,49,144,11 :REM*88
2Ø55 DATA46,223,49,165,25Ø,2Ø8,2,198 :REM*1
2Ø56 DATA251,198,25Ø,96,32,216,36,78:REM*96
2Ø57 DATA223,49,144,9,11Ø,223,49,23Ø
                                    :REM*171
2Ø58 DATA25Ø,2Ø8,2,23Ø,251,96,1Ø,7 :REM*12Ø
2Ø59 DATA246,213,1Ø,228,246,243,216,7:REM*5
2Ø6Ø DATA216,213,231,228,231,243,37,37
                                    :REM*184
2Ø61 DATA36,36,37,36,36,36,36,37    :REM*121
2Ø62 DATA36,36,36,36,36,36,Ø        :REM*2Ø8
2Ø7Ø BSAVE"P.ULTRAPLOT",BØ,P9Ø35 TO P9529
                                    :REM*3Ø
3ØØØ FORZ=1416ØTO15228:READY:POKEZ,Y:NEXT
                                    :REM*199
3ØØ1 DATA32,128,3,32,9,136,142,7    :REM*18
3ØØ2 DATA5Ø,32,15,136,165,22,141,81:REM*2Ø5
3ØØ3 DATA59,165,23,141,82,59,32,15  :REM*94
3ØØ4 DATA136,165,22,141,83,59,165,23:REM*29
3ØØ5 DATA141,84,59,32,15,136,165,22 :REM*96
3ØØ6 DATA141,85,59,165,23,141,86,59:REM*123
3ØØ7 DATA32,15,136,165,22,141,87,59:REM*1Ø4
3ØØ8 DATA165,23,141,88,59,162,Ø,142:REM*179
3ØØ9 DATA75,59,142,76,59,142,79,59 :REM*216
3Ø1Ø DATA142,8Ø,59,142,74,59,232,142:REM*23
3Ø11 DATA78,59,169,1Ø4,141,77,59,169
                                    :REM*17Ø
3Ø12 DATA8,141,73,59,32,247,55,2Ø8 :REM*255
3Ø13 DATA82,32,15,136,165,22,141,75 :REM*72
3Ø14 DATA59,165,23,141,76,59,32,247:REM*231
3Ø15 DATA55,2Ø8,64,32,15,136,165,22 :REM*86
3Ø16 DATA141,77,59,165,23,141,78,59 :REM*11
3Ø17 DATA32,247,55,2Ø8,46,32,15,136 :REM*7Ø
3Ø18 DATA165,22,141,79,59,165,23,141
                                    :REM*231
3Ø19 DATA8Ø,59,32,247,55,2Ø8,28,32 :REM*1Ø2
3Ø2Ø DATA15,136,165,22,141,73,59,165:REM*17
3Ø21 DATA23,141,74,59,24,144,12,162:REM*21Ø
3Ø22 DATAØ,169,61,16Ø,Ø,32,116,255 :REM*121
3Ø23 DATA2Ø1,44,96,172,75,59,173,76 :REM*24
3Ø24 DATA59,32,89,59,162,239,16Ø,58:REM*229
3Ø25 DATA32,1Ø2,175,162,224,16Ø,58,32
                                    :REM*196
3Ø26 DATA1Ø2,175,172,77,59,173,78,59
                                    :REM*119
3Ø27 DATA32,89,59,162,244,16Ø,58,32 :REM*14
3Ø28 DATA1Ø2,175,172,73,59,173,74,59
                                    :REM*1Ø1
3Ø29 DATA32,89,59,162,249,16Ø,58,32 :REM*36
3Ø3Ø DATA1Ø2,175,172,79,59,173,8Ø,59:REM*95
3Ø31 DATA32,89,59,162,254,16Ø,58,32 :REM*2Ø
3Ø32 DATA1Ø2,175,169,254,16Ø,58,32,99:REM*5
3Ø33 DATA175,32,63,175,162,3,16Ø,59:REM*2Ø8
3Ø34 DATA32,1Ø2,175,169,254,16Ø,58,32
                                    :REM*237
3Ø35 DATA99,175,32,66,175,162,8,16Ø :REM*52
3Ø36 DATA59,32,1Ø2,175,169,Ø,141,213
                                    :REM*189
3Ø37 DATA58,172,85,59,173,86,59,32  :REM*32
3Ø38 DATA3,175,162,13,16Ø,59,32,1Ø2:REM*121
3Ø39 DATA175,172,87,59,173,88,59,32 :REM*58
3Ø4Ø DATA3,175,162,18,16Ø,59,32,1Ø2:REM*189
3Ø41 DATA175,172,81,59,173,82,59,32 :REM*9Ø
3Ø42 DATA3,175,162,23,16Ø,59,32,1Ø2:REM*157
3Ø43 DATA175,172,83,59,173,84,59,32:REM*254
3Ø44 DATA3,175,162,28,16Ø,59,32,1Ø2:REM*225
3Ø45 DATA175,169,244,16Ø,58,32,93,175
                                    :REM*146
3Ø46 DATA169,239,16Ø,58,32,99,175,32
                                    :REM*183
3Ø47 DATA21,175,32,1Ø8,175,169,249,16Ø
                                    :REM*238
3Ø48 DATA58,32,99,175,32,39,175,32 :REM*173
3Ø49 DATAØ,175,165,1Ø3,73,255,141,222
                                    :REM*3Ø
3Ø5Ø DATA58,165,1Ø2,73,255,141,223,58:REM*9
3Ø51 DATA238,222,58,2Ø8,3,238,223,58:REM*34
3Ø52 DATA169,224,16Ø,58,32,99,175,32
                                    :REM*177
3Ø53 DATA63,175,169,13,16Ø,59,32,93 :REM*88
3Ø54 DATA175,32,33,175,162,33,16Ø,59
                                    :REM*2Ø7
3Ø55 DATA32,1Ø2,175,169,224,16Ø,58,32
                                    :REM*234
3Ø56 DATA99,175,32,66,175,169,18,16Ø:REM*71
3Ø57 DATA59,32,93,175,32,33,175,162:REM*138
3Ø58 DATA38,16Ø,59,32,1Ø2,175,169,38:REM*65
3Ø59 DATA16Ø,59,32,99,175,169,8,16Ø  :REM*2
3Ø6Ø DATA59,32,93,175,32,33,175,162:REM*141
3Ø61 DATA48,16Ø,59,32,1Ø2,175,169,33
                                    :REM*17Ø
3Ø62 DATA16Ø,59,32,99,175,169,3,16Ø  :REM*1
3Ø63 DATA59,32,93,175,32,33,175,162:REM*144
3Ø64 DATA53,16Ø,59,32,1Ø2,175,169,48:REM*23
3Ø65 DATA16Ø,59,32,99,175,169,53,16Ø:REM*62
3Ø66 DATA59,32,93,175,32,21,175,162:REM*1Ø7
3Ø67 DATA43,16Ø,59,32,1Ø2,175,169,33:REM*96
3Ø68 DATA16Ø,59,32,99,175,169,8,16Ø :REM*11
3Ø69 DATA59,32,93,175,32,33,175,162:REM*15Ø
3Ø7Ø DATA48,16Ø,59,32,1Ø2,175,169,38:REM*85
3Ø71 DATA16Ø,59,32,99,175,169,3,16Ø :REM*1Ø
3Ø72 DATA59,32,93,175,32,33,175,169 :REM*1Ø
3Ø73 DATA48,16Ø,59,32,93,175,32,27 :REM*197
3Ø74 DATA175,162,38,16Ø,59,32,1Ø2,175
                                    :REM*174
3Ø75 DATA162,4,189,43,59,157,33,59 :REM*197
3Ø76 DATA2Ø2,16,247,169,23,16Ø,59,32
                                    :REM*2Ø8
3Ø77 DATA99,175,169,33,16Ø,59,32,93:REM*1Ø5
3Ø78 DATA175,32,27,175,162,229,16Ø,58
                                    :REM*76
3Ø79 DATA32,1Ø2,175,169,28,16Ø,59,32:REM*19
3Ø8Ø DATA93,175,169,38,16Ø,59,32,99:REM*238
3Ø81 DATA175,32,21,175,162,234,16Ø,58
                                    :REM*221
3Ø82 DATA32,1Ø2,175,173,213,58,24Ø,74
                                    :REM*48
3Ø83 DATA173,214,58,174,215,58,141,196
                                    :REM*241
3Ø84 DATA49,142,197,49,173,216,58,174
                                    :REM*88
3Ø85 DATA217,58,141,198,49,142,199,49
                                    :REM*221
3Ø86 DATA169,229,16Ø,58,32,99,175,32
                                    :REM*222
3Ø87 DATA116,59,14Ø,2ØØ,49,14Ø,214,58
                                    :REM*245
3Ø88 DATA141,2Ø1,49,141,215,58,169,234
                                    :REM*23Ø
3Ø89 DATA16Ø,58,32,99,175,32,116,59:REM*129
3Ø9Ø DATA14Ø,2Ø2,49,14Ø,216,58,141,2Ø3
                                    :REM*8Ø
3Ø91 DATA49,141,217,58,32,75,35,56  :REM*31
3Ø92 DATA176,47,238,213,58,169,229,16Ø
                                    :REM*28
3Ø93 DATA58,32,99,175,32,116,59,14Ø :REM*89
3Ø94 DATA214,58,14Ø,218,58,141,215,58
                                    :REM*2Ø6
3Ø95 DATA141,219,58,169,234,16Ø,58,32
                                    :REM*179
3Ø96 DATA99,175,32,116,59,14Ø,22Ø,58
                                    :REM*23Ø
```

→

Listing 1 continued.

```
3Ø97 DATA14Ø,216,58,141,217,58,141,221
                                        :REM*233
3Ø98 DATA58,173,222,58,2Ø8,3,2Ø6,223
                                        :REM*146
3Ø99 DATA58,2Ø6,222,58,173,222,58,2Ø8
                                        :REM*75
31ØØ DATA5,173,223,58,24Ø,27,169,224
                                        :REM*172
31Ø1 DATA16Ø,58,32,93,175,169,249,16Ø
                                        :REM*1Ø1
31Ø2 DATA58,32,99,175,32,27,175,162:REM*248
31Ø3 DATA224,16Ø,58,32,1Ø2,175,76,232
                                        :REM*19
31Ø4 DATA56,173,75,59,2Ø8,7Ø,173,76:REM*242
31Ø5 DATA59,2Ø8,65,169,1Ø4,77,77,59:REM*215
31Ø6 DATA2Ø8,58,169,1,77,78,59,2Ø8  :REM*24
31Ø7 DATA51,173,214,58,174,215,58,141
                                        :REM*51
31Ø8 DATA196,49,142,197,49,173,216,58
                                        :REM*2ØØ
31Ø9 DATA174,217,58,141,198,49,142,199
                                        :REM*225
311Ø DATA49,173,218,58,174,219,58,141
                                        :REM*24Ø
3111 DATA2ØØ,49,142,2Ø1,49,173,22Ø,58
                                        :REM*13
3112 DATA174,221,58,141,2Ø2,49,142,2Ø3
                                        :REM*16
3113 DATA49,32,75,35,96,Ø,Ø,Ø       :REM*125
3114 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*232
3115 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*233
3116 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*234
3117 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*235
3118 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*236
3119 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*237
312Ø DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*238
3121 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*239
3122 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*24Ø
3123 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*241
3124 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*242
3125 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*243
3126 DATAØ,Ø,131,73,15,218,162,13Ø  :REM*96
3127 DATAØ,Ø,Ø,Ø,128,Ø,Ø,Ø         :REM*147
3128 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø           :REM*246
3129 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø           :REM*247
313Ø DATAØ,32,3,175,32,1Ø8,175,16Ø :REM*178
3131 DATA1Ø4,169,1,32,3,175,32,39  :REM*249
3132 DATA175,169,58,16Ø,59,32,93,175
                                        :REM*246
3133 DATA32,33,175,96,32,Ø,175,164 :REM*197
3134 DATA1Ø3,165,1Ø2,96,Ø            :REM*1Ø
314Ø BSAVE"P.UHCIRCLE",BØ,P1416Ø TO P15228
                                        :REM*188
4ØØØ FORZ=12992TO14158:READY:POKEZ,Y:NEXT
                                        :REM*2Ø7
4ØØ1 DATA32,128,3,32,15,136,165,22 :REM*1Ø6
4ØØ2 DATA141,38,55,165,23,141,39,55:REM*133
4ØØ3 DATA32,9,136,142,37,55,32,9   :REM*2Ø8
4ØØ4 DATA136,142,4Ø,55,32,81,51,2Ø8:REM*169
4ØØ5 DATA66,32,9,136,142,5Ø,55,32  :REM*12Ø
4ØØ6 DATA81,51,2Ø8,6Ø,32,9,136,142 :REM*147
4ØØ7 DATA51,55,32,81,51,2Ø8,62,32  :REM*22Ø
4ØØ8 DATA9,136,142,52,55,32,9,136  :REM*193
4ØØ9 DATA142,53,55,32,81,51,2Ø8,52 :REM*124
4Ø1Ø DATA32,9,136,142,54,55,32,9   :REM*211
4Ø11 DATA136,142,55,55,32,9,136,142:REM*12Ø
4Ø12 DATA56,55,32,9,136,142,57,55  :REM*243
4Ø13 DATA76,93,51,169,255,141,5Ø,55 :REM*98
4Ø14 DATA173,5Ø,55,16Ø,7,153,5Ø,55 :REM*163
4Ø15 DATA136,2Ø8,25Ø,24Ø,4Ø,16Ø,1,162
                                        :REM*196
4Ø16 DATA3,32,7Ø,51,16Ø,3,162,7    :REM*143
4Ø17 DATA32,7Ø,51,76,93,51,185,5Ø  :REM*1Ø2
4Ø18 DATA55,157,5Ø,55,2Ø2,136,16,246
                                        :REM*175
4Ø19 DATA96,162,Ø,169,61,16Ø,Ø,32  :REM*144
4Ø2Ø DATA116,255,2Ø1,44,96,173,Ø,255
                                        :REM*199
4Ø21 DATA41,254,141,Ø,255,169,Ø,141:REM*244
4Ø22 DATA58,55,141,59,55,141,6Ø,55 :REM*149
4Ø23 DATA141,61,55,169,Ø,133,158,169
                                        :REM*122
4Ø24 DATA224,133,159,169,255,133,174,169
                                        :REM*75
4Ø25 DATA253,133,175,32,1Ø8,54,144,1
                                        :REM*132
4Ø26 DATA96,173,37,55,141,62,55,169:REM*249
4Ø27 DATA255,141,63,55,141,64,55,32 :REM*68
4Ø28 DATA166,53,32,195,53,173,38,55:REM*223
4Ø29 DATA2Ø1,127,2Ø8,7,173,39,55,2Ø1
                                        :REM*1Ø8
4Ø3Ø DATA2,24Ø,24,238,38,55,2Ø8,3  :REM*227
4Ø31 DATA238,39,55,32,1Ø8,54,144,229
                                        :REM*166
4Ø32 DATA173,38,55,2Ø8,3,2Ø6,39,55 :REM*121
4Ø33 DATA2Ø6,38,55,169,Ø,141,35,55 :REM*226
4Ø34 DATA141,36,55,173,38,55,32,35  :REM*73
4Ø35 DATA54,173,39,55,32,35,54,173  :REM*82
4Ø36 DATA37,55,24Ø,91,2Ø6,37,55,32   :REM*3
4Ø37 DATA1Ø8,54,176,75,173,35,55,2Ø8
                                        :REM*248
4Ø38 DATA75,173,38,55,32,166,53,173 :REM*37
4Ø39 DATA39,55,32,166,53,173,37,55  :REM*3Ø
4Ø4Ø DATA32,166,53,174,63,55,2Ø2,236:REM*19
4Ø41 DATA37,55,24Ø,26,174,58,55,2Ø8 :REM*32
4Ø42 DATA21,32,85,54,141,45,55,32    :REM*77
4Ø43 DATA85,54,32,195,53,173,45,55  :REM*42
4Ø44 DATA32,195,53,238,58,55,173,63:REM*171
4Ø45 DATA55,141,64,55,173,37,55,141 :REM*58
4Ø46 DATA63,55,238,35,55,2Ø8,5,169 :REM*173
4Ø47 DATAØ,141,35,55,238,37,55,173 :REM*184
4Ø48 DATA37,55,2Ø1,199,176,95,238,37
                                        :REM*115
4Ø49 DATA55,32,1Ø8,54,176,79,173,36 :REM*9Ø
4Ø5Ø DATA55,2Ø8,79,174,62,55,232,236
                                        :REM*211
4Ø51 DATA37,55,24Ø,5,174,58,55,24Ø  :REM*4Ø
4Ø52 DATA8,174,64,55,236,62,55,2Ø8  :REM*19
4Ø53 DATA23,32,85,54,141,45,55,32  :REM*12Ø
4Ø54 DATA85,54,32,195,53,173,45,55  :REM*53
4Ø55 DATA32,195,53,162,1,142,58,55 :REM*178
4Ø56 DATA173,37,55,141,62,55,173,38:REM*1Ø3
4Ø57 DATA55,32,166,53,173,39,55,32 :REM*126
4Ø58 DATA166,53,173,37,55,32,166,53:REM*151
4Ø59 DATA238,36,55,2Ø8,5,169,Ø,141  :REM*16
4Ø6Ø DATA36,55,2Ø6,37,55,32,149,54 :REM*117
4Ø61 DATA173,38,55,2Ø8,5,173,39,55 :REM*162
4Ø62 DATA24Ø,27,173,38,55,2Ø8,3,2Ø6  :REM*1
4Ø63 DATA39,55,2Ø6,38,55,32,1Ø8,54 :REM*228
4Ø64 DATA176,3,76,215,51,238,38,55 :REM*179
4Ø65 DATA2Ø8,3,238,39,55,174,58,55 :REM*116
4Ø66 DATA24Ø,25,173,38,55,32,195,53:REM*2Ø3
4Ø67 DATA173,39,55,32,195,53,173,37:REM*12Ø
4Ø68 DATA55,32,195,53,162,Ø,142,58 :REM*169
4Ø69 DATA55,24Ø,18,173,38,55,32,35 :REM*254
4Ø7Ø DATA54,173,39,55,32,35,54,173 :REM*117
4Ø71 DATA37,55,32,35,54,173,59,55  :REM*212
4Ø72 DATA2Ø1,1Ø,144,3,32,2,54,32    :REM*253
4Ø73 DATA183,53,141,37,55,141,62,55 :REM*36
4Ø74 DATA2Ø1,255,24Ø,15,32,183,53,141
                                        :REM*223
4Ø75 DATA39,55,32,183,53,141,38,55  :REM*82
4Ø76 DATA76,157,51,173,59,55,24Ø,6 :REM*195
4Ø77 DATA32,2,54,24,144,245,32,21Ø :REM*14Ø
4Ø78 DATA53,141,37,55,2Ø1,255,2Ø8,1:REM*127
4Ø79 DATA96,32,21Ø,53,141,47,55,32  :REM*66
4Ø8Ø DATA21Ø,53,141,46,55,32,21Ø,53:REM*161
4Ø81 DATA141,45,55,32,21Ø,53,141,44 :REM*62
4Ø82 DATA55,32,79,53,76,38,53,173  :REM*141
4Ø83 DATA37,55,41,7,141,48,55,173  :REM*25Ø
```

→

Listing 1 continued.

```
4084 DATA44,55,41,7,141,49,55,173  :REM*219
4085 DATA45,55,141,39,55,173,44,55 :REM*206
4086 DATA141,38,55,172,48,55,185,50:REM*255
4087 DATA55,172,49,55,57,26,55,208  :REM*58
4088 DATA3,32,142,54,206,49,55,16  :REM*147
4089 DATA5,169,7,141,49,55,173,44  :REM*250
4090 DATA55,208,3,206,45,55,206,44  :REM*65
4091 DATA55,173,45,55,48,15,205,47 :REM*202
4092 DATA55,144,10,208,194,173,44,55:REM*41
4093 DATA205,46,55,176,186,96,141,76 :REM*2
4094 DATA55,169,174,32,224,53,165,174
                                    :REM*231
4095 DATA208,2,198,175,198,174,96,230
                                    :REM*214
4096 DATA174,208,2,230,175,169,174,32
                                    :REM*124
4097 DATA244,53,96,141,76,55,169,158
                                    :REM*129
4098 DATA32,224,53,230,158,208,2,230:REM*80
4099 DATA159,96,165,158,208,2,198,159:REM*7
4100 DATA198,158,169,158,32,244,53,96
                                    :REM*174
4101 DATA142,77,55,162,0,160,0,141 :REM*185
4102 DATA185,2,173,76,55,32,119,255 :REM*30
4103 DATA174,77,55,96,142,77,55,162:REM*217
4104 DATA0,160,0,32,116,255,174,77 :REM*126
4105 DATA55,96,32,60,54,141,44,55  :REM*255
4106 DATA32,60,54,141,45,55,32,60  :REM*230
4107 DATA54,141,46,55,32,60,54,141 :REM*175
4108 DATA47,55,32,60,54,141,37,55  :REM*216
4109 DATA76,79,53,238,59,55,172,61  :REM*91
4110 DATA55,153,65,55,238,61,55,172:REM*170
4111 DATA61,55,192,11,144,5,160,0    :REM*5
4112 DATA140,61,55,96,206,59,55,172:REM*222
4113 DATA60,55,185,65,55,238,60,55 :REM*163
4114 DATA172,60,55,192,11,144,5,160:REM*108
4115 DATA0,140,60,55,96,206,59,55   :REM*51
4116 DATA206,61,55,172,61,55,16,5   :REM*76
4117 DATA160,10,140,61,55,172,61,55 :REM*23
4118 DATA185,65,55,96,32,215,54,141:REM*234
4119 DATA34,55,173,38,55,41,7,170  :REM*161
4120 DATA189,26,55,45,34,55,240,7   :REM*36
4121 DATA173,40,55,240,7,56,96,173  :REM*65
4122 DATA40,55,240,249,24,96,173,40:REM*148
4123 DATA55,240,13,208,5,173,40,55  :REM*79
4124 DATA208,6,169,0,141,41,55,44  :REM*106
4125 DATA169,1,141,41,55,32,215,54  :REM*67
4126 DATA141,34,55,173,38,55,41,7  :REM*138
4127 DATA170,189,26,55,174,41,55,240
                                    :REM*133
4128 DATA5,13,34,55,208,5,73,255    :REM*140
4129 DATA45,34,55,141,34,55,162,18 :REM*177
4130 DATA173,43,55,172,42,55,32,145 :REM*70
4131 DATA48,173,34,55,76,172,48,174:REM*171
4132 DATA37,55,160,0,169,80,32,28    :REM*12
4133 DATA49,173,39,55,141,34,55,138:REM*101
4134 DATA72,173,38,55,78,34,55,106  :REM*26
4135 DATA78,34,55,106,78,34,55,106  :REM*29
4136 DATA174,34,55,141,34,55,104,24:REM*136
4137 DATA109,34,55,141,42,55,152,105:REM*21
4138 DATA0,141,43,55,162,18,173,43 :REM*116
4139 DATA55,172,42,55,32,145,48,76 :REM*109
4140 DATA161,48,128,64,32,16,8,4   :REM*110
4141 DATA2,1,0,0,0,0,0,0             :REM*31
4142 DATA0,0,0,0,0,0,0,0,0          :REM*240
4143 DATA0,0,0,0,0,0,0,0,0          :REM*241
4144 DATA0,0,0,0,0,0,0,0,0          :REM*242
4145 DATA0,0,0,0,0,0,0,0,0          :REM*243
4146 DATA0,0,0,0,0,0,0,0            :REM*104
4150 BSAVE"P.PATTERN.FILL",B0,P12992 TO P14
     158                            :REM*246
5000 FORZ=15232TO15276:READY:POKEZ,Y:NEXT
                                    :REM*165
5001 DATA32,201,255,169,0,32,210,255
                                    :REM*242
5002 DATA169,0,32,210,255,169,16,32 :REM*41
5003 DATA210,255,173,48,50,32,210,255
                                    :REM*214
5004 DATA96,32,198,255,32,207,255,32
                                    :REM*129
5005 DATA207,255,32,207,255,32,207,255
                                     :REM*68
5006 DATA141,48,50,96,5             :REM*115
5010 BSAVE"P.L/S.K",B0,P15232 TO P15276
                                    :REM*43
6000 FORZ=15616TO15804:READY:POKEZ,Y:NEXT
                                    :REM*151
6001 DATA32,128,3,32,9,136,224,5    :REM*112
6002 DATA176,109,202,142,173,61,189,184
                                    :REM*107
6003 DATA61,141,168,61,32,9,136,142 :REM*78
6004 DATA131,61,169,0,141,0,255,141 :REM*89
6005 DATA178,61,141,179,61,32,127,61:REM*86
6006 DATA162,25,142,175,61,32,143,61
                                    :REM*135
6007 DATA174,173,61,189,180,61,141,176
                                    :REM*72
6008 DATA61,162,80,142,177,61,162,18:REM*63
6009 DATA173,179,61,172,178,61,32,145
                                    :REM*16
6010 DATA48,32,161,48,32,210,255,206:REM*83
6011 DATA177,61,208,245,206,174,61,16
                                    :REM*62
6012 DATA20,174,173,61,142,174,61,24
                                    :REM*183
6013 DATA173,178,61,105,80,141,178,61
                                    :REM*48
6014 DATA144,3,238,179,61,206,176,61
                                    :REM*253
6015 DATA208,199,206,175,61,208,182,32
                                    :REM*42
6016 DATA204,255,169,4,76,195,255,162
                                    :REM*31
6017 DATA4,138,160,5,32,186,255,32  :REM*26
6018 DATA192,255,162,4,76,201,255,162
                                    :REM*115
6019 DATA0,189,159,61,8,41,127,32    :REM*38
6020 DATA210,255,232,40,16,243,96,27
                                    :REM*141
6021 DATA71,49,54,48,59,56,48,59    :REM*142
6022 DATA50,59,50,27,218,0,0,0      :REM*113
6023 DATA0,0,0,0,8,16,24,32         :REM*172
6024 DATA49,50,51,52,255            :REM*235
6030 BSAVE"OLIVETTI",B0,P15616 TO P15804
                                    :REM*223
7000 FORZ=15616TO15940:READY:POKEZ,Y:NEXT
                                    :REM*163
7001 DATA32,128,3,32,9,136,202,142  :REM*54
7002 DATA54,62,189,56,62,141,55,62 :REM*191
7003 DATA189,60,62,141,38,62,32,9  :REM*244
7004 DATA136,142,191,61,173,0,255,41
                                    :REM*129
7005 DATA254,141,0,255,32,183,61,162
                                    :REM*132
7006 DATA0,142,41,62,142,42,62,162  :REM*85
7007 DATA80,142,40,62,173,41,62,72 :REM*152
7008 DATA173,42,62,72,32,204,61,173 :REM*25
7009 DATA41,62,72,173,42,62,72,32  :REM*244
7010 DATA244,61,32,226,61,104,141,42
                                    :REM*237
7011 DATA62,104,168,200,208,3,238,42:REM*30
7012 DATA62,140,41,62,206,40,62,208:REM*241
7013 DATA222,172,54,62,185,64,62,160
                                    :REM*152
7014 DATA80,140,46,62,160,0,140,47  :REM*55
7015 DATA62,74,176,9,14,46,62,46    :REM*86
7016 DATA47,62,24,144,244,104,168,104
                                    :REM*103
7017 DATA24,109,46,62,141,41,62,152:REM*254
```

→

Listing 1 continued.

```
7Ø18 DATA1Ø9,47,62,141,42,62,2Ø6,38:REM*239
7Ø19 DATA62,2Ø8,156,32,2Ø4,255,169,4
                                    :REM*188
7Ø2Ø DATA32,195,255,96,142,44,62,14Ø
                                    :REM*127
7Ø21 DATA45,62,162,18,173,45,62,172:REM*2Ø2
7Ø22 DATA44,62,32,145,48,32,161,48 :REM*129
7Ø23 DATA174,44,62,172,45,62,96,169:REM*188
7Ø24 DATAØ,133,183,162,4,138,16Ø,5 :REM*159
7Ø25 DATA32,186,255,32,192,255,162,4:REM*58
7Ø26 DATA32,2Ø1,255,96,162,Ø,189,218:REM*47
7Ø27 DATA61,32,21Ø,255,232,224,8,2Ø8:REM*26
7Ø28 DATA245,96,13,1Ø,27,49,27,75   :REM*89
7Ø29 DATA128,2,16Ø,8,162,7,3Ø,46    :REM*19Ø
7Ø3Ø DATA62,1Ø6,2Ø2,16,249,32,21Ø,255
                                    :REM*11
7Ø31 DATA136,2Ø8,241,96,174,54,62,189
                                    :REM*168
7Ø32 DATA64,62,141,39,62,172,42,62 :REM*225
7Ø33 DATA174,41,62,32,156,61,72,138:REM*126
7Ø34 DATA24,1Ø5,8Ø,144,1,2ØØ,17Ø,2Ø6
                                    :REM*133
7Ø35 DATA39,62,2Ø8,239,162,7,172,55 :REM*16
7Ø36 DATA62,1Ø4,157,46,62,2Ø2,48,5  :REM*15
7Ø37 DATA136,2Ø8,247,24Ø,241,96,Ø,Ø :REM*3Ø
7Ø38 DATAØ,Ø,Ø,Ø,Ø,Ø,Ø,Ø            :REM*75
7Ø39 DATAØ,Ø,Ø,Ø,Ø,Ø,1,Ø           :REM*2Ø4
7Ø4Ø DATA1,2,4,8,25,5Ø,1ØØ,2ØØ      :REM*123
7Ø41 DATA8,4,2,1,255                :REM*164
7Ø5Ø BSAVE "SPIRIT8Ø",BØ,P15616 TO P1594Ø
                                    :REM*129
7Ø6Ø POKE15837,49:POKE15839,76      :REM*35
7Ø7Ø BSAVE "EPSON",BØ,P15616 TO P1594Ø
                                    :REM*141
8ØØØ PRINT"{CRSR DN}ALL DONE!"      :REM*163
```

Listing 2. *MAKE UH V1.1*

```
1Ø GRAPHIC1,1:GRAPHIC5              :REM*44
2Ø PRINT"{SHFT CLR}{CRSR DN} MAKING NEW ULT
   RA HIRES V1.1"                   :REM*194
3Ø BLOAD"ULTRA HIRES",BØ,P7168      :REM*25Ø
4Ø BLOAD"P.PATTERN.FILL",BØ,P12992   :REM*2
5Ø BLOAD"P.UHCIRCLE",BØ,P1416Ø      :REM*25Ø
6Ø BLOAD"P.ULTRA.K",BØ,P1536Ø       :REM*25Ø
7Ø BLOAD"P.ULTRAPLOT",BØ,P9Ø35      :REM*216
8Ø BLOAD"P.L/S.K",BØ,P15232         :REM*58
9Ø PRINT"{CRSR DN}ENTER DESIRED PRINTER DRI
   VER"                             :REM*152
1ØØ PRINT"1=OLIVETTI PR23ØØ{2 SPACEs}2=EPSO
   N{2 SPACEs}3=SPIRIT 8Ø"          :REM*194
11Ø GETKEY A$                       :REM*92
12Ø IF A$="1"THEN BLOAD"OLIVETTI",BØ,P15616
   :GOTO16Ø                         :REM*154
13Ø IF A$="2"THEN BLOAD"EPSON",BØ,P15616:GO
   TO16Ø                            :REM*224
135 IF A$="3"THEN BLOAD"SPIRIT8Ø",BØ,P15616
   :GOTO16Ø                         :REM*191
14Ø GOTO11Ø                         :REM*86
16Ø POKE8513,Ø:POKE8514,6Ø          :REM*2Ø
17Ø POKE98ØØ,57:POKE98Ø1,37:POKE9852,57:POK
   E9853,37:POKE9964,57:POKE9965,37:REM*92
18Ø POKE8799,192                    :REM*64
19Ø POKE86Ø2,Ø:POKE86Ø3,61          :REM*146
2ØØ POKE11822,128:POKE11823,59:POKE11887,15
   3:POKE11888,59                   :REM*1Ø
21Ø POKE12236,197:POKE12237,6Ø      :REM*116
22Ø FOR T=12421 TO 12432:READ A:POKE T,A:NE
   XT                               :REM*2Ø6
23Ø DATA 32,87,65,76,82,85,83,79,7Ø,84,32,3
   2                                :REM*2Ø6
24Ø RENAME "ULTRA HIRES" TO "ULTRA HIRES.OL
   D"                               :REM*248
25Ø BSAVE"ULTRA HIRES",BØ,P7168 TO P16383
                                    :REM*216
26Ø PRINT"{2 CRSR DNs}DONE!"        :REM*217
27Ø END                             :REM*17
```

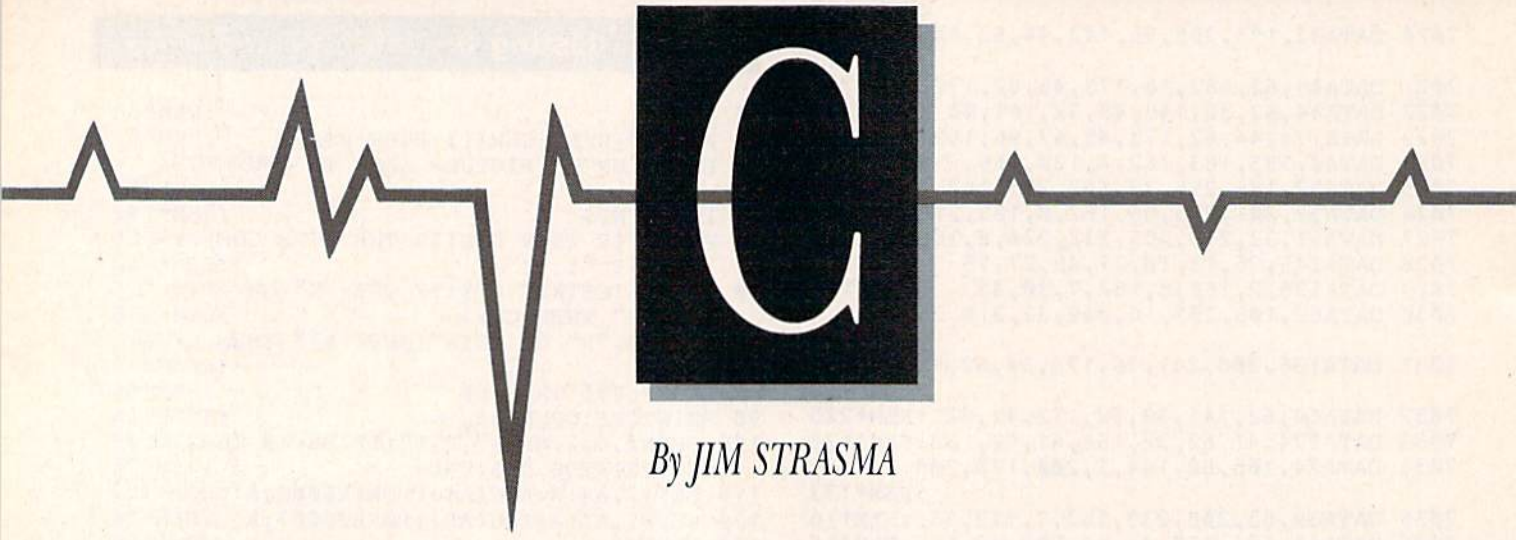
Listing 3. *UH.PIC CONVERT*

```
1Ø FAST                             :REM*48
2Ø PRINT"{SHFT CLR}{2 CRSR DNs}"    :REM*62
3Ø PRINT"ENTER PICTURE NAME TO CONVERT";
                                    :REM*6
4Ø INPUT NF$                        :REM*152
5Ø PRINT"{2 CRSR DNs}IS THE FILE COMPRESSED
   (Y/N)? ";                        :REM*162
6Ø CF=255:GETKEY CF$:IF CF$="Y" OR CF$= "{S
   HFT Y}" THEN CF=1                :REM*138
7Ø IF CF$="N" OR CF$="{SHFT N}" THEN CF=Ø
                                    :REM*216
8Ø IF CF=255 THEN 6Ø                :REM*88
9Ø PRINTCF$:OPEN1,8,15              :REM*166
1ØØ OPEN2,8,2,NF$+",P,R":IF DS<>Ø THEN CLOS
   E2:PRINTDS,DS$:END               :REM*78
11Ø GET#2,A$:A=ASC(A$):POKE2ØØØ2,A :REM*192
12Ø GET#2,A$:A=ASC(A$):POKE2ØØØ3,A  :REM*1Ø
13Ø CLOSE2                          :REM*15Ø
14Ø BLOAD ""+NF$,BØ,P2ØØØ4          :REM*66
15Ø EF=PEEK(174)+PEEK(175)*256      :REM*158
16Ø IF DS<>Ø THEN PRINT DS,DS$:END  :REM*2Ø
17Ø NF$=LEFT$(NF$,12)+".NEW":PRINT"{2 CRSR
   DNs}WRITING ";NF$;" ..."         :REM*46
18Ø POKE2ØØØ,16:POKE2ØØ1,CF         :REM*174
19Ø BSAVE ""+NF$,BØ,P2ØØØØ TO PØ+EF:REM*212
2ØØ CLOSE1:PRINT"ALL DONE!":END     :REM*146
```


Circle 192 on Reader Service card.



COMMODORE CLINIC



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 61455-6100

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: *Will* RUN *support the Amiga with articles and type-in programs like they are providing for the C-64 and C-128?*

Pete Hendler
Lillington, NC

A: CW Communications, the company that sponsors *RUN*, also publishes a magazine especially for Amiga owners, called *AmigaWorld*, headed by veteran *RUN* staffers. This gives proper coverage to the new machine, while allowing *RUN* to focus on the C-64 and C-128. We expect many *RUN* subscribers will enjoy both magazines.

Q: *Is it true that software companies are creating new products that cannot be loaded by the Indus GT disk drive because these disks contain codes meant to prevent duplication?*

Alan Ludwig
Staten Island, NY

A: Yes, it's true, although that wasn't the companies' intent. In trying to prevent even skilled programmers from duplicating their disks, several companies have used non-standard disk commands dependent on the precise ROM in the Commodore 1541. Some of these programs won't even run on Commodore's 1571 drive, let alone on Commodore-compatible drives like the Indus.

The only solution is not to buy copy-protected programs you can't return. Personally, I go a step further and don't buy copy-protected programs at all. That allows me to use any disk drive I like.

Q: *It's logical that an 80-column card uses twice the memory on the C-64. Can products that expand Basic memory help this, and will the result be 100% compatible with programs?*

Darren Cohen
Huntington Beach, CA

A: Yes, memory-mapped 80-column displays do require more memory than 40-column equivalents, typically 2K of RAM instead of 1K. (Since 80-column cards for the C-64 are monochrome, color RAM needs are unchanged.) However, you will probably notice a loss of more Basic memory than this. The Batteries Included BI-80, for example, also uses some memory for added Basic commands.

Unfortunately, current expanded-memory products are not able to expand Basic memory while at the same time guaranteeing 100% compatibility with other programs, let alone an 80-column card.

If you need both an 80-column display and added memory, you might be happiest trading up to a C-128, which already contains those features.

Q: *Can used ribbons be reinked if they are otherwise in good shape? I have a Tally Spirit 80 printer.*

James David
Bloomington, MN

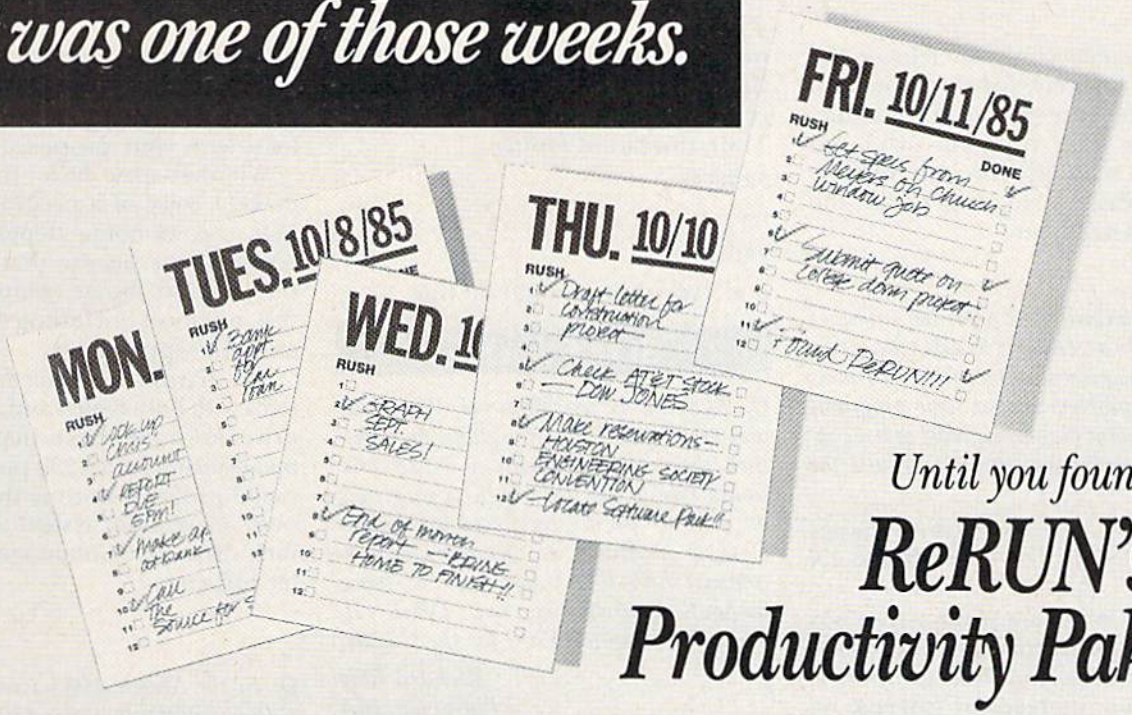
A: Yes, they can. Computer Friends (Suite 10, 6415 SW Canyon Court, Portland, OR 97225; 503-297-2321) is one supplier of the special inks and reinking machines needed. They have recently announced universal models that work on most printers, including yours.

Q: *Why must there be a hole in the side of a disk in order for the disk drive to be able to write? Are the holes not put on commercial disks as a protection from pirates?*

Pete Talwar
New City, NY

A: Properly used, the hole is both a way of making sure the disk is put into the disk drive correctly and a way of telling the hardware in the drive whether or not the disk may be altered. On the 1541, a light sensor on the side of the drive mechanism notices whether or not the disk may be altered. By simply covering the hole with the foil tabs packed with most disks, or even with a strip of opaque tape, you can protect an important disk from being accidentally changed.

It was one of those weeks.



Until you found ReRUN's Productivity Pak

Monday, you needed to locate an important account and type a 10 page report.

Tuesday, you had to adjust the family budget because the bank adjusted your mortgage.

Wednesday, a client needed graphics for a last-minute presentation.

By ***Thursday***, you were wishing you'd had one software package that could have handled everything.

Get Vital Information In Seconds!

Now, you and your C-64 or C-128 can pull all the loose ends together with *ReRUN's Productivity Pak*—a disk full of ready-to-run home applications. Sensational programs from *RUN* magazine, plus several *never-before-published programs*. Word processing, database management, home finance, spreadsheet calculating, telecommunications and more—everything on one disk for your most important computing tasks.

File It, Find It!

The *Productivity Pak* features ***RUN***'s highly-acclaimed and *completely updated* **"DATAFILE"** series (including DFCalc!)—a practical database management system by Mike Konshak that's been a proven winner with *RUN* readers:

"Outstanding! This program is probably the best I have found in any magazine, and is already at use in my business applications as well as my personal library."—David Rice
Sterling, IL

Put Your Commodore to Work

You'll also tap into such *never-before published programs* as **"HOME FINANCE AID"**—watch your Commodore determine your mortgage loan payments, or calculate the future value of your investments!

Plus, you'll get **"BASIC 4.5"**, a programming utility that makes your C-64 more productive. It includes commands for sprite graphics and animation, as well as improved disk handling.

The *Productivity Pak* includes a booklet with complete documentation and loading instructions. Easy to use, easy to order.

Don't let another week go by without it. Simply return the coupon with payment today, or call ☎**1-800-258-5473.** (In NH, dial 1-924-9471.)

Programs will run on C-64 and C-128 (in 64 mode) disk only.
*Commodore 64 and 128 are registered trademarks of Commodore Business Machines, Inc.

YES. ***I want better productivity at home and at work.***
Please send me the ***ReRUN Productivity Pak*** disk:
☐ Payment enclosed ($21.47) ☐ AE ☐ Visa ☐ MC

Card # Exp. Date

Signature

Name

Address

City State Zip

ReRUN, 80 Pine St., Peterborough, NH 03458 **5-86P**

Find the right program for every job

Commercial companies leave the holes off entirely, for the same reason—to be sure you won't accidentally alter their program disks. Do not cut a write-protect hole in such disks unless you no longer want the programs on them.

Q: I have a Cardprint A printer interface connected to an Olivetti Praxis typewriter, with a typewriter interface from Williams Labs. My problem is that some programs require several blank linefeeds, and I cannot get these on my printer. What's the secret?

Larry Thomas
Hooks, TX

A: I used to have a printer that was nearly identical to yours, and I had the same problem. The solution is not to send linefeeds or carriage returns by themselves. Instead, send a single space followed by a carriage return (and linefeed, if needed). Thus, instead of typing

```
PRINT#4
```

try

```
PRINT#4," "
```

and everything should be fine.

SOFTWARE

Q: At work, we use DBase II, WordStar, and other such CP/M programs on eight-inch disks. I just bought a C-128 and would love to use some of these programs on it. Since we are registered purchasers of these programs, is there any way to convert them so I could work at home without repurchasing, say, DBase II, which is listing for $700 for the C-128?

Richard Ellis
Plainville, MA

A: I agree that $700 for DBase II on the C-128 is utterly ridiculous, but there are hardware and legal problems with your proposed solution.

Whether you have the right to make a copy of a program for business use at home depends on the terms of the license that came with the program. Some companies allow this, but most (including Ashton-Tate and Micropro) don't.

The hardware problem is that systems with both 8-inch and 5¼-inch disk drives are quite scarce. In practice, this means using an RS-232 port and a terminal program to copy the programs onto a computer system that uses 5¼-inch disks in a Commodore-compatible format.

Q: In the March 1985 issue of RUN, *I noticed information about a church package for the 64. That is what I need. Did it materialize?*

Rev. Philip Heinze
Niagara Falls, Ontario
Canada

A: Yes, it did. It's called the Electric Evangelist, is used by about 200 churches and is now available for $39.95 from its three authors, Ken Bedell, Larry Woolard and myself, at PO Box 6100, Macomb, IL 61455.

Q: I am very interested in artificial intelligence. Unfortunately, I have been unable to locate the Commodore LISP or PROLOG I need for such programming.

I'm told that about five years ago OWL-LISP was on the market in Britain for the Pet computer. Perhaps you could provide me with the address of a computer club in Britain that I could pursue for information.

Nic Barker
Walla Walla, WA

A: The club best able to help you there is ICPUG. Its chairman and contact for technical queries is Mike Todd (27 Nursery Gardens, Lodgefield, Welwyn Garden City, Herts, AL7 1SF, England). For membership information, contact Jack Cohen (30 Brancaster Road, Newbury Park, Ilford, Essex, IG2 7EP, England).

Circle 177 on Reader Service card.

IS IT POSSIBLE TO MAKE THE BEST ANY BETTER?!



NEW! CPM-128 Mode

And it still has:

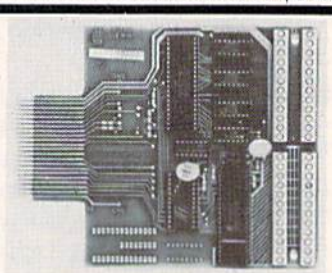
- Built-in Self Test with Status Report
- Microprocessor controlled emulation of Commodore printers for compatability with popular software
- Standard 4K Buffer
- Optional Transparent Mode
- External switch selectable Commodore graphics mode for Epson, Star Micronics, C. Itoh Prowriter, Okidata, Seikosha, Banana, BMC, Panasonic, Mannesman-Talley, Think Jet & others.

★ ★ ★ ★ ★ ★ ★ ★

NEW INTRODUCTORY SALE!
PRICE $89.00

Universal Input/Output Board for C-64 & C-128

- 16 Channel 8-bit A/D converter with 100 microsecond sampling time.
- 1 D/A output
- 16 high voltage/high current discrete output
- 1 EPROM socket
- Use multiple boards for additional channels up to 6 boards



MW-611 ..... $225.00

Dealer Inquiries invited

Micro World Computers, Inc. (303) 987-9531
3333 S. Wadsworth Blvd. #C105
Lakewood, CO 80227

VISA | MasterCard | MICRO R&D INCORPORATED

Circle 60 on Reader Service card.

DELUXE RS232 INTERFACE



- COMPATIBLE WITH ALL STANDARD RS232 EQUIPMENT
- SUPPORTS ALL NEEDED PINS (2 thru 8, 12, 20, & 22)
- INCLUDES 3 FOOT CABLE AT NO EXTRA CHARGE
- BASIC TERMINAL ROUTINE INCLUDED
- RECOMMENDED BY COMMODORE & BROTHER
- EASY TO USE
- SUGGESTED LIST ONLY $49.95

NEW FOR RS232 PRINTERS!!!

The RS232 Printer Interface is an accessory which allows you to connect your RS232 Printer to the Commodore Serial Bus. Supports 300, 600, 1200, 2400 and more! This is the only interface available which gives you maximum software compatibility! Suggested list only **$79.95**

See your local dealer or
CALL (206) 236-2983
DEALERS CALL US!

Omnitronix
P.O. BOX 43-DEPT.R -MERCER IS., WA 98040

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

SUNRISE SOFTWARE

8901 NW 26 ST
SUNRISE, FL 33322

MUST LIQUIDATE
Letter Quality, Daisy Wheel
COMPUTER PRINTER
AT BELOW DEALER COST!

FACTORY NEW! FIRST QUALITY!



- Letter Quality, Daisy Wheel
- Can be interfaced with virtually all computer systems including IBM, Apple and Commodore, with the addition of a printer interface (not included).

Manufacturer's closeout of excess inventory is the reason for this liquidation. Add this **letter quality** printer to your present computer system at a fraction of normal cost. This printer uses standard 96 character printwheel and easy-load ribbon cartridge. Quiet operation. Uni- and bi-directional printing of fully formed upper and lower case letters, numerals, symbols at 18 cps. ASCII character codes. 10, 12 or 15 characters per inch or proportional spacing. Line feed spacing of 1/48" minimum. Friction feed. Takes 13" maximum paper width. Prints 12" wide. Four-position impression control. Produces original and four lightweight copies. Approx. 21 lbs. 19½" x 14½" x 5". 110V AC.

One Year Limited Factory Warranty!

Mfr. List Price $550.00

Liquidation Price Now At $169

Item H-1184-4919-007 Ship, handling: $9.00

Credit card customers can order by phone, 24 hours a day, 7 days a week.

Toll-Free: 1-800-328-0609

Your check is welcome! No delays in orders paid by check.

Sales outside continental U.S. are subject to special conditions. Please call or write to inquire.

C.O.M.B. Direct Marketing Corp. **Item H-1184**
14605 28th Ave. N./Minneapolis, MN 55441-3397

Send ___ **TOWA Letter Quality Printer(s)** Item H-1184-4919-007 at $169 each plus $9 each for shipping, handling. (Minnesota residents add 6% sales tax. Allow 3-4 weeks for delivery. 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: ☐ MasterCard® ☐ VISA®

Acct. No. _____ Exp. ____/____

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____

State _____ ZIP _____

Phone ( ) _____

Sign Here _____

C.O.M.B. Direct Marketing Corp.
Authorized Liquidator
14605 28th Avenue North
Minneapolis, Minnesota 55441-3397

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 151 on Reader Service card.

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!

PROGRAMMING

Q: When I make a mistake and press the delete key, the error erases on the screen, but still prints out on paper. Is there another command I have to use?

Darlene Davis
Fairfield, CA

A: I can think of two common causes for this problem. First, many new programmers forget to press the return key after correcting a Basic program line on the screen. Until you press return on that line, the correction will not become part of your program.

Another common cause is a program that accepts all keystrokes, including delete, as part of its input. The resulting data appears all right on the screen, because the deletion works normally there, but can't work on most printers. Even if your printer can back up one space, it can't erase characters it has already printed.

In this case, the solution is to modify the Get loop used to accept input data in your program. Add an If statement to make the Get loop notice the delete key; then, instead of adding the delete to the growing string of characters, have the loop reassign the string to all but the string's own last character, using a subroutine similar to this:

```
10 A$=""
15 L=LEN(A$)
20 IF L > 254 THEN 65
25 GET G$
30 PRINT G$;
35 IF G$ <> CHR$(20) THEN 50
40 IF L THEN A$=LEFT$(A$, L-1)
45 GOTO 15
50 IF G$=CHR$(13) THEN 65
55 A$=A$+G$
60 GOTO 15
65 RETURN
```

Q: The VIC-20 allows easy placement of characters anywhere on the screen from within a program, by Poking row and column locations with the following:

POKE 214,ROW
POKE 211,COL

What are the comparable locations on the 64?

J. Grove
Chicago, IL

A: Those locations, like most others in the first three pages of memory, are the same on the C-64 as on the VIC-20. Just follow the same two Pokes with a simple Print statement, to be sure all screen variables are properly updated, and remember that both row and column counts start with zero.

Q: On my C-64, I found two Pokes I call pagers:

POKE 53265,85:REM EVERY DIRECTION
POKE 53265,95:REM DOWN

The screen's text section is reduced, and, on some sides of the screen, the cursor is cut off. Am I really paging? I'm seven years old.

Joshua Shagam
Albuquerque, NM

A: Since you uncovered this effect at age seven, I asked my nine-year-old son to help find the answer. Here's what we found out for you.

Bits 0–2 of memory location 53265 control fine-scrolling of the screen, allowing a user to move text on the screen vertically one row of pixels at a time, rather than the usual full character at a time (eight rows of pixels).

Bit 3 of that same location selects either a 24- or 25-line display. By selecting 24 lines, you can create a line of text without making it immediately visible, thereby helping to preserve the illusion of smooth-scrolling beyond the eight-pixel range provided by the VIC II chip.

Your first Poke selects a 24-line display, with a vertical offset of five rows of pixels. The second Poke selects a 25-line display, with a seven-row vertical offset. Just be sure to leave the high-order four bits alone, as they have other uses.

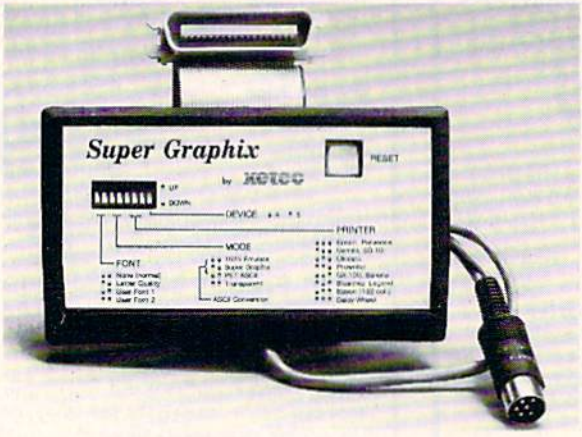
Here is a sample routine for playing with this effect:

```
10 B3=8:REM 25 ROWS, 0 FOR 24 ROWS
20 B0=0:REM PIXEL OFFSET, 0-7
30 POKE 53265, (PEEK(53265 AND
   240)+(B3 AND 8)+(B0 AND 7))
```

R

Circle 96 on Reader Service card.

Super Graphix



You Asked For It . . . Here It Is!!!

GRAPHICS and FONTS plus an 8K BUFFER for the ultimate in performance and speed. The XETEC Super Graphix interface for Commodore Computers now offers a new high in technology with these features:

- 8K Buffer Standard
- 10 Printing Modes
- 3 Internal Screen Dumps
- Extensive Command Channel
- Reset Button to Halt Printing from Buffer
- Switch Settings on Label for Quick Reference
- Correspondence Quality Font Built-In
- Capable of Storing 2 Additional Fonts
- Correct Graphics/Text Aspect Ratio for all Major Printers
- 8 Active Switches with Changes Constantly Monitored
- Internal Fonts Support Super-script, Sub-script, Underlining, Bold-face and Choice of 9 Pitches

Suggested list $99.95 • Includes Lifetime Warranty

XETEC, Inc. / 3010 Arnold Rd. / Salina, KS 67401 / 913-827-0685

Circle 123 on Reader Service card.

HOT ACCOUNTS™

The most highly acclaimed bookkeeping system for the Commodore 64 & 128*

A Superb!
An exceptional program that outshines all others.
RUN Magazine, Nov. 1984

HOT ACCOUNTS™* teaches you bookkeeping as it automatically performs dozens of full-service accounting functions. It is a complete system that will instantly organize your records and receipts and supply charts, formal statements, and budget information. Now your records can be accurate, up to date and confidential ■ Tracks charge cards, checkbooks, all transactions ■ Requires no prior knowledge of accounting ■ Home or small business ■ Improves your financial image ■ Cost less than 1 hour with a C.P.A.

HOT ACCOUNTS™ Bookkeeping System on Disk for the 64 & 128 in 64 mode.

For **RUSH** delivery, send check or money order for $39.95 to:
C.Ed. Software
3051 India Street
San Diego, CA 92103

Credit card orders, call **toll-free**
1-800-621-0852 ext. 238
VISA MASTERCARD

P.S. ***Use* HOT ACCOUNTS *™ to do your taxes and the price is tax deductible!***

BONUS OFFER (Order now and receive a full featured, 60 function **word processing** & 3-D **business graphics** package as our **FREE** gift to you.

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. R6, 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)



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. R5
Arlington, VA 22205
Information/Telephone Orders (703) 237-4796

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 J4W2K3, CANADA
PHONE 1-514-672-7060

MUST LIQUIDATE

Commodore Compatible Total Telecommunications™

MODEM



Factory New! First Quality!

90-Day Limited Factory Warranty!

FCC Approved

- ***Access the stock market, take college classes, do your shopping, and a whole lot more!***
- ***For Commodore 64K or SX64!***
- ***Has modular jacks for quick, easy hookup to your phone system!***
- ***Works on TouchTone® and Rotary (Pulse) dialing system (not PBX)!***

Liquidation due to an overstock! This single communications package connects your Commodore 64K or SX64 for on-line telephone use. No special computer knowledge is required. Super-intelligent software is completely menu-driven!

Features: 30K software buffer, 300 Baud, auto dial, auto answer helps eliminate complex modem steps. Works on Tone and Rotary phone systems (not on PBX). Upload and download of text, programs, data files. Prints or stores downloaded files. Captures and displays high resolution, mapped graphics files. Color selection menu. Connect-time clock keeps track of log-on time. ASCII or Commodore characters. Smooth screen rolling. Includes 6-ft. modular phone cord. **Equipment needed:** C64, Monitor, and disk drive or SX64.

NOTE: Price includes trial subscription to over 52 data base services for vast information. Initial sign-up fee is FREE. All you pay is the on-line time you use, plus monthly rate.

Mfr. List: $109.95
Liquidation Priced At **$19**
Item H-1150-3646-007 Ship, handling: $4.00

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. Item H-1150
14605 28th Ave. N./Minneapolis, MN 55441-3397
Send ___ Modem(s) Item H-1150-3646-007 at $19 each plus $4 each for ship. handling. (Minnesota residents add 6% sales tax. Allow 3-4 weeks for delivery. 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: ☐ MasterCard ☐ VISA®

Acct. No. _____ Exp. ___/___

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____

State _____ ZIP _____

Phone (___) _____

Sign Here _____

C.O.M.B. Direct Marketing Corp.
Authorized Liquidator
14605 28th Avenue North
Minneapolis, Minnesota 55441-3397

Checksums for *RUN* 1985 Programs

Last February, in response to many reader inquiries, we began a series of checksum listings for programs published in 1985 before our C-64 checksum program, 64 Perfect Typist, appeared in September. August was covered in February and July in April's issue. Below, you will find the June programs' checksum listings.

To use the checksums, you must first load and run 64 Perfect Typist (see How to Type Listings, on page 110); then get out your June issue and begin typing in any program you find in the listings below. Every time you hit the return key, a number from 0 to 255 will appear. If you enter a line correctly, the number following the ":REM" next to the line number will appear.*

If you have already entered one of the programs from June and desire to check it for accuracy, simply enter 64 Perfect Typist, list lines individually or in small groups and position the cursor on the line you want to check. Next, press the return key, and, if you've entered the line correctly, the number that appears below the line will match the number following the ":REM" in the listings.*

You can look forward to seeing more of these listings of 1985 programs in subsequent 1986 issues of RUN.

Double Your Basic!, by Robert Rockefeller; June, p. 102.

```
1Ø      :REM*2Ø
15      :REM*235
2Ø      :REM*252
3Ø      :REM*1Ø8
4Ø      :REM*118
5Ø      :REM*144
6Ø       :REM*36
7Ø       :REM*5Ø
8Ø      :REM*158
9Ø      :REM*184
1ØØ      :REM*76
32768   :REM*146
32778   :REM*212
32788   :REM*1Ø2
32798    :REM*1Ø
32808   :REM*234
32818    :REM*42
32828    :REM*22
32838   :REM*142
32848    :REM*28
32858   :REM*186
32868    :REM*66
32878    :REM*52
32888   :REM*186
32898   :REM*186
32908    :REM*62
32918   :REM*118
32928    :REM*94
32938   :REM*218
32948    :REM*12
32958   :REM*25Ø
32968    :REM*18
32978   :REM*136
32988    :REM*2Ø
32998    :REM*98
33008   :REM*112
33018   :REM*216
33028    :REM*23
33038   :REM*249
33048   :REM*187
33058    :REM*39
33068    :REM*71
33078   :REM*157
33088   :REM*233
33098   :REM*1Ø9
33108    :REM*11
33118   :REM*155
33128   :REM*1Ø3
33138   :REM*167
33148   :REM*169
33158   :REM*221
33168   :REM*197
33178    :REM*43
33188    :REM*61
33198   :REM*189
33208    :REM*27
33218   :REM*211
33228   :REM*141
33238    :REM*97
33248   :REM*127
33258   :REM*241
33268   :REM*129
33278   :REM*123
33288   :REM*23Ø
33298   :REM*18Ø
33308   :REM*158
33318    :REM*68
33328   :REM*142
33338    :REM*16
33348   :REM*186
33358   :REM*19Ø
33368     :REM*2
33378   :REM*188
33388    :REM*82
33398    :REM*78
33408   :REM*17Ø
33418   :REM*254
33428   :REM*186
33438   :REM*112
33448    :REM*88
33458   :REM*12Ø
33468    :REM*2Ø
33478   :REM*216
33488    :REM*92
33498   :REM*2Ø2
33508   :REM*142
33518   :REM*152
33528    :REM*24
33538    :REM*73
33548    :REM*37
33558    :REM*35
33568   :REM*245
33578    :REM*47
33588   :REM*199
33598    :REM*37
33608   :REM*177
33618    :REM*41
33628   :REM*141
33638   :REM*233
33648   :REM*2Ø9
33658   :REM*191
33668   :REM*183
33678   :REM*135
33688   :REM*239
33698     :REM*5
33708    :REM*43
33718   :REM*2Ø5
33728    :REM*19
33738    :REM*75
33748     :REM*7
33758    :REM*47
33768   :REM*187
33778    :REM*77
33788   :REM*141
33798   :REM*11Ø
33808   :REM*15Ø
33818     :REM*Ø
33828    :REM*62
33838    :REM*42
33848   :REM*188
33858   :REM*124
33868   :REM*1Ø4
33878   :REM*1ØØ
33888    :REM*58
33898   :REM*248
33908   :REM*168
33918    :REM*32
33928    :REM*22
33938   :REM*182
33948    :REM*92
33958   :REM*176
33968     :REM*4
33978    :REM*96
33988   :REM*252
33998   :REM*226
34008    :REM*8Ø
34018   :REM*154
34028   :REM*214
34038     :REM*8
34048    :REM*93
34058    :REM*99
34068   :REM*239
34078    :REM*51
34088    :REM*43
34098   :REM*139
34108   :REM*153
34118   :REM*249
34128    :REM*55
34138    :REM*51
34148    :REM*79
34158    :REM*43
34168    :REM*49
34178    :REM*41
34188    :REM*85
34198   :REM*2Ø7
34208    :REM*73
34218   :REM*231
34228   :REM*215
34238   :REM*243
34248     :REM*3
34258   :REM*181
34268    :REM*57
34278     :REM*5
34288   :REM*165
34298   :REM*219
34308   :REM*182
34318   :REM*152
34328   :REM*17Ø
34338    :REM*78
34348    :REM*76
34358   :REM*172
34368   :REM*2Ø4
34378   :REM*114
34388     :REM*Ø
34398   :REM*126
34408   :REM*21Ø
34418   :REM*13Ø
34428   :REM*186
34438    :REM*72
34448   :REM*22Ø
34458     :REM*Ø
34468    :REM*36
34478    :REM*82
34488   :REM*156
34498   :REM*172
34508   :REM*22Ø
34518   :REM*2Ø6
34528   :REM*21Ø
34538    :REM*76
34548   :REM*14Ø
34558   :REM*232
34568   :REM*149
34578   :REM*247
34588   :REM*121
34598   :REM*247
34608    :REM*31
34618   :REM*119
34628   :REM*153
34638   :REM*133
34648    :REM*49
34658   :REM*197
34668   :REM*161
34678    :REM*31
34688    :REM*71
34698    :REM*45
34708     :REM*1
34718   :REM*141
34728    :REM*73
34738   :REM*227
34748    :REM*43
34758    :REM*69
34768   :REM*177
34778   :REM*185
34788   :REM*143
34798   :REM*231
34808   :REM*251
34818   :REM*162
34828    :REM*44
34838    :REM*9Ø
34848    :REM*76
34858   :REM*144
34868   :REM*1Ø2
34878   :REM*12Ø
34888   :REM*164
34898   :REM*216
34908   :REM*254
34918   :REM*1Ø6
38306   :REM*229
38316   :REM*147
38326   :REM*129
38336   :REM*151
38346    :REM*13
```

C-64 Big Letters, by Jimmie Bernard; June, p. 36.

Listing 1.

```
1Ø      :REM*13Ø
2Ø       :REM*9Ø
3Ø      :REM*1Ø8
4Ø       :REM*46
5Ø       :REM*36
6Ø        :REM*6
7Ø       :REM*66
75      :REM*133
8Ø      :REM*226
85      :REM*2Ø7
9Ø       :REM*7Ø
95       :REM*97
1ØØ     :REM*22Ø
1Ø5     :REM*237
11Ø     :REM*1Ø6
115     :REM*177
12Ø     :REM*12Ø
13Ø      :REM*54
14Ø     :REM*144
15Ø      :REM*46
16Ø     :REM*226
17Ø     :REM*24Ø
171     :REM*185
172     :REM*25Ø
173      :REM*71
174     :REM*166
175      :REM*49
176     :REM*212
177     :REM*189
178      :REM*74
179      :REM*83
18Ø     :REM*166
181     :REM*115
182      :REM*54
183      :REM*19
184     :REM*17Ø
185     :REM*137
186     :REM*1ØØ
187     :REM*119
188     :REM*116
189     :REM*175
19Ø      :REM*24
191     :REM*233
192     :REM*188
193     :REM*247
195     :REM*245
2ØØ     :REM*244
2Ø5     :REM*223
21Ø     :REM*1ØØ
215     :REM*233
22Ø     :REM*22Ø
222     :REM*1Ø2
225      :REM*97
23Ø     :REM*242
235      :REM*89
24Ø      :REM*26
25Ø      :REM*82
26Ø     :REM*151
262     :REM*137
265      :REM*68
27Ø     :REM*219
275      :REM*78
28Ø     :REM*2Ø1
29Ø      :REM*97
3ØØ     :REM*1Ø5
31Ø      :REM*79
32Ø      :REM*23
33Ø      :REM*55
34Ø     :REM*2Ø7
35Ø      :REM*75
36Ø     :REM*233
37Ø     :REM*165
38Ø      :REM*43
39Ø     :REM*2Ø9
4ØØ     :REM*145
41Ø     :REM*183
42Ø     :REM*199
43Ø     :REM*137
44Ø     :REM*243
45Ø      :REM*45
46Ø      :REM*87
47Ø     :REM*149
48Ø      :REM*67
49Ø      :REM*19
495      :REM*88
5ØØ     :REM*225
51Ø      :REM*93
52Ø     :REM*24Ø
53Ø      :REM*78
```

Listing 2.

```
17Ø      :REM*42
171       :REM*5
7ØØ     :REM*178
71Ø       :REM*8
72Ø     :REM*242
73Ø       :REM*2
74Ø     :REM*15Ø
75Ø      :REM*6Ø
76Ø       :REM*8
77Ø      :REM*55
78Ø       :REM*5
1ØØØ    :REM*115
1Ø1Ø    :REM*173
1Ø2Ø     :REM*37
1Ø3Ø     :REM*68
```

Listing 3.

```
1Ø       :REM*7Ø
2Ø       :REM*9Ø
3Ø      :REM*124
35      :REM*143
4Ø       :REM*64
45       :REM*77
5Ø      :REM*164
6Ø        :REM*6
7Ø       :REM*3Ø
8Ø      :REM*246
9Ø      :REM*152
1ØØ     :REM*2Ø8
1Ø5     :REM*167
11Ø      :REM*9Ø
12Ø      :REM*82
14Ø     :REM*184
15Ø      :REM*22
16Ø      :REM*56
165     :REM*2Ø9
17Ø      :REM*98
172      :REM*32
175     :REM*217
18Ø      :REM*52
19Ø     :REM*186
195      :REM*81
196      :REM*14
2ØØ      :REM*14
2Ø5     :REM*2Ø9
21Ø       :REM*8
215      :REM*65
22Ø     :REM*122
23Ø     :REM*15Ø
24Ø     :REM*142
25Ø     :REM*218
26Ø     :REM*233
27Ø      :REM*41
28Ø      :REM*55
29Ø     :REM*167
3ØØ     :REM*159
31Ø     :REM*121
32Ø     :REM*1Ø9
33Ø     :REM*199
34Ø      :REM*67
35Ø     :REM*185
1ØØØ    :REM*221
1ØØ5     :REM*28
1Ø1Ø     :REM*113
1Ø2Ø     :REM*123
1Ø25      :REM*19
1Ø3Ø      :REM*46
1Ø4Ø     :REM*154
1Ø45     :REM*145
1Ø46      :REM*88
1Ø47     :REM*153
1Ø48      :REM*16
1Ø49     :REM*253
1Ø5Ø     :REM*244
1Ø55     :REM*211
1Ø6Ø     :REM*1Ø2
1Ø65      :REM*49
1Ø7Ø     :REM*2ØØ
1Ø8Ø      :REM*34
1Ø9Ø     :REM*2Ø2
1Ø95     :REM*1Ø7
1Ø99     :REM*121
```

Call the Doctor, by John Tanzini; June, p. 50.

```
1ØØØ     :REM*117
1Ø1Ø     :REM*111
1Ø2Ø     :REM*171
1Ø3Ø     :REM*132
1Ø4Ø     :REM*212
1Ø5Ø     :REM*152
1Ø6Ø     :REM*178
1Ø7Ø     :REM*2Ø4
1Ø8Ø      :REM*7Ø
1Ø9Ø     :REM*112
11ØØ       :REM*6
111Ø     :REM*122
112Ø      :REM*1Ø
113Ø     :REM*13Ø
114Ø      :REM*74
115Ø     :REM*246
116Ø      :REM*7Ø
117Ø     :REM*254
118Ø     :REM*244
119Ø     :REM*166
12ØØ      :REM*9Ø
121Ø     :REM*192
122Ø      :REM*66
123Ø      :REM*7Ø
124Ø      :REM*86
125Ø     :REM*232
126Ø       :REM*2
127Ø     :REM*184
128Ø     :REM*2Ø7
129Ø     :REM*147
13ØØ     :REM*227
131Ø      :REM*93
132Ø      :REM*47
133Ø     :REM*177
134Ø      :REM*97
135Ø     :REM*151
136Ø     :REM*2Ø7
137Ø      :REM*97
138Ø      :REM*11
139Ø      :REM*35
14ØØ     :REM*157
141Ø     :REM*215
142Ø      :REM*63
143Ø     :REM*255
144Ø     :REM*189
145Ø     :REM*243
146Ø     :REM*193
147Ø     :REM*1Ø3
148Ø     :REM*171
149Ø      :REM*19
15ØØ     :REM*245
151Ø     :REM*141
152Ø     :REM*235
153Ø       :REM*9
154Ø     :REM*188
155Ø     :REM*228
156Ø     :REM*154
157Ø     :REM*1Ø4
158Ø     :REM*174
159Ø      :REM*7Ø
16ØØ      :REM*82
161Ø      :REM*28
162Ø      :REM*36
163Ø     :REM*114
164Ø      :REM*32
165Ø     :REM*178
166Ø     :REM*238
167Ø       :REM*6
168Ø      :REM*92
169Ø      :REM*46
17ØØ      :REM*36
171Ø      :REM*32
172Ø     :REM*172
173Ø     :REM*232
174Ø      :REM*32
175Ø     :REM*182
176Ø     :REM*152
177Ø     :REM*128
178Ø      :REM*66
179Ø      :REM*26
18ØØ      :REM*29
181Ø     :REM*187
182Ø     :REM*195
183Ø      :REM*93
184Ø      :REM*71
185Ø       :REM*7
186Ø     :REM*187
187Ø       :REM*3
188Ø     :REM*1Ø3
189Ø      :REM*71
19ØØ      :REM*85
191Ø      :REM*47
192Ø     :REM*191
193Ø     :REM*253
194Ø     :REM*221
195Ø     :REM*213
196Ø      :REM*31
197Ø     :REM*1Ø3
198Ø     :REM*1Ø7
199Ø     :REM*159
2ØØØ      :REM*67
2Ø1Ø      :REM*31
2Ø2Ø      :REM*67
2Ø3Ø      :REM*51
2Ø4Ø     :REM*2Ø7
2Ø5Ø     :REM*168
2Ø6Ø       :REM*4
2Ø7Ø      :REM*92
2Ø8Ø      :REM*92
2Ø9Ø     :REM*112
21ØØ     :REM*174
211Ø     :REM*18Ø
212Ø     :REM*158
213Ø     :REM*134
214Ø      :REM*84
215Ø     :REM*172
216Ø     :REM*214
217Ø     :REM*192
218Ø     :REM*254
219Ø       :REM*4
22ØØ     :REM*238
221Ø     :REM*226
222Ø      :REM*44
223Ø     :REM*156
224Ø     :REM*174
225Ø     :REM*144
226Ø       :REM*6
227Ø     :REM*132
228Ø     :REM*186
229Ø     :REM*252
23ØØ     :REM*144
231Ø      :REM*73
232Ø      :REM*87
233Ø     :REM*147
234Ø     :REM*1Ø7
235Ø     :REM*135
236Ø     :REM*145
237Ø     :REM*249
238Ø      :REM*29
239Ø     :REM*119
24ØØ     :REM*173
241Ø     :REM*123
242Ø      :REM*33
243Ø      :REM*31
244Ø     :REM*221
245Ø     :REM*153
246Ø      :REM*71
247Ø     :REM*235
248Ø     :REM*195
249Ø     :REM*127
25ØØ     :REM*215
251Ø     :REM*227
252Ø      :REM*15
253Ø       :REM*1
254Ø      :REM*47
255Ø      :REM*47
256Ø     :REM*132
257Ø      :REM*54
258Ø      :REM*36
259Ø     :REM*162
26ØØ      :REM*98
261Ø     :REM*134
262Ø     :REM*244
263Ø     :REM*19Ø
264Ø     :REM*218
265Ø      :REM*74
266Ø     :REM*216
267Ø      :REM*94
268Ø      :REM*36
269Ø      :REM*44
27ØØ     :REM*198
271Ø      :REM*86
272Ø     :REM*122
273Ø     :REM*186
274Ø      :REM*52
275Ø      :REM*66
276Ø     :REM*1Ø4
277Ø     :REM*232
278Ø      :REM*36
279Ø     :REM*252
28ØØ     :REM*144
281Ø     :REM*152
282Ø      :REM*73
283Ø      :REM*47
284Ø      :REM*23
285Ø      :REM*57
286Ø      :REM*45
287Ø      :REM*35
288Ø     :REM*1Ø7
289Ø      :REM*43
29ØØ     :REM*179
291Ø     :REM*1Ø3
292Ø     :REM*163
293Ø      :REM*43
294Ø      :REM*99
295Ø      :REM*39
296Ø     :REM*159
297Ø     :REM*155
298Ø      :REM*31
299Ø     :REM*183
3ØØØ     :REM*161
3Ø1Ø      :REM*89
3Ø2Ø      :REM*17
3Ø3Ø      :REM*31
3Ø4Ø     :REM*121
3Ø5Ø      :REM*51
3Ø6Ø     :REM*2Ø5
3Ø7Ø     :REM*183
3Ø8Ø      :REM*5Ø
3Ø9Ø     :REM*232
31ØØ      :REM*38
311Ø      :REM*68
312Ø     :REM*234
313Ø     :REM*1ØØ
314Ø     :REM*1Ø4
315Ø      :REM*42
316Ø      :REM*22
317Ø     :REM*136
318Ø     :REM*178
319Ø     :REM*192
32ØØ     :REM*12Ø
321Ø     :REM*212
322Ø     :REM*148
323Ø      :REM*88
324Ø     :REM*21Ø
325Ø       :REM*6
326Ø      :REM*52
327Ø     :REM*162
```

→

Listing continued.

```
328Ø    :REM*22
329Ø     :REM*6
33ØØ   :REM*1Ø6
331Ø    :REM*28
332Ø   :REM*174
333Ø   :REM*137
334Ø    :REM*57
335Ø   :REM*217
336Ø   :REM*161
337Ø   :REM*217
338Ø   :REM*225
339Ø   :REM*145
34ØØ     :REM*3
341Ø   :REM*129
342Ø   :REM*131
343Ø   :REM*1Ø3
344Ø   :REM*2Ø3
345Ø    :REM*51
346Ø   :REM*227
347Ø    :REM*67
348Ø   :REM*215
349Ø    :REM*45
35ØØ   :REM*199
351Ø    :REM*99
352Ø   :REM*129
353Ø    :REM*73
354Ø   :REM*2Ø3
355Ø   :REM*211
356Ø    :REM*91
357Ø    :REM*81
358Ø   :REM*249
359Ø    :REM*82
36ØØ    :REM*94
361Ø   :REM*118
362Ø   :REM*158
363Ø   :REM*138
364Ø   :REM*178
365Ø    :REM*12
366Ø   :REM*194
367Ø   :REM*172
368Ø   :REM*166
369Ø   :REM*192
37ØØ    :REM*76
371Ø    :REM*24
372Ø    :REM*72
373Ø   :REM*218
374Ø   :REM*18Ø
375Ø    :REM*46
376Ø    :REM*56
377Ø   :REM*236
378Ø   :REM*228
379Ø    :REM*86
38ØØ    :REM*96
381Ø   :REM*16Ø
382Ø   :REM*156
383Ø   :REM*164
384Ø   :REM*245
385Ø    :REM*21
386Ø    :REM*55
387Ø    :REM*21
388Ø   :REM*215
389Ø   :REM*153
39ØØ   :REM*139
391Ø    :REM*29
392Ø   :REM*229
393Ø   :REM*123
394Ø   :REM*193
395Ø    :REM*83
396Ø   :REM*197
397Ø    :REM*87
398Ø   :REM*217
399Ø   :REM*227
4ØØØ   :REM*177
4Ø1Ø   :REM*167
4Ø2Ø   :REM*113
4Ø3Ø    :REM*89
4Ø4Ø   :REM*239
4Ø5Ø    :REM*71
4Ø6Ø   :REM*151
4Ø7Ø   :REM*247
4Ø8Ø     :REM*9
4Ø9Ø    :REM*67
41ØØ    :REM*82
411Ø   :REM*196
412Ø   :REM*1Ø2
413Ø   :REM*12Ø
414Ø    :REM*22
415Ø   :REM*2ØØ
416Ø   :REM*124
417Ø   :REM*1Ø8
418Ø   :REM*136
419Ø   :REM*194
42ØØ   :REM*172
421Ø   :REM*254
422Ø     :REM*Ø
423Ø   :REM*122
424Ø   :REM*168
425Ø    :REM*3Ø
426Ø   :REM*2ØØ
427Ø   :REM*198
428Ø    :REM*44
429Ø    :REM*36
43ØØ    :REM*56
431Ø   :REM*248
432Ø   :REM*126
433Ø   :REM*166
434Ø   :REM*25Ø
435Ø    :REM*98
436Ø    :REM*83
437Ø    :REM*97
438Ø   :REM*117
439Ø   :REM*117
44ØØ   :REM*189
441Ø   :REM*177
442Ø   :REM*217
443Ø   :REM*133
444Ø    :REM*65
445Ø   :REM*2Ø1
446Ø    :REM*93
447Ø   :REM*175
448Ø   :REM*247
449Ø   :REM*249
45ØØ   :REM*227
451Ø    :REM*91
452Ø   :REM*247
453Ø   :REM*247
454Ø   :REM*133
455Ø   :REM*217
456Ø   :REM*135
457Ø   :REM*151
458Ø    :REM*19
459Ø   :REM*1Ø1
46ØØ    :REM*91
461Ø   :REM*234
462Ø   :REM*112
463Ø    :REM*64
464Ø   :REM*176
465Ø     :REM*2
466Ø   :REM*178
467Ø    :REM*62
468Ø     :REM*8
469Ø   :REM*24Ø
47ØØ   :REM*168
471Ø     :REM*2
472Ø   :REM*252
473Ø   :REM*176
474Ø    :REM*62
475Ø    :REM*26
476Ø    :REM*52
477Ø   :REM*218
478Ø   :REM*222
479Ø   :REM*14Ø
48ØØ   :REM*25Ø
481Ø   :REM*194
482Ø    :REM*84
483Ø    :REM*94
484Ø     :REM*6
485Ø   :REM*178
486Ø    :REM*62
487Ø   :REM*121
488Ø    :REM*93
489Ø   :REM*183
49ØØ   :REM*177
491Ø   :REM*1Ø3
492Ø   :REM*119
493Ø   :REM*2Ø7
494Ø   :REM*233
495Ø   :REM*219
496Ø   :REM*155
497Ø    :REM*45
498Ø   :REM*2Ø1
499Ø    :REM*39
5ØØØ    :REM*61
5Ø1Ø    :REM*77
5Ø2Ø    :REM*93
5Ø3Ø   :REM*219
5Ø4Ø   :REM*117
5Ø5Ø     :REM*7
```

C-64 Shuffle, by Buck Childress; June, p. 74.

```
5       :REM*237
1Ø       :REM*2Ø
15      :REM*157
2Ø      :REM*2Ø8
25       :REM*99
3Ø       :REM*18
4Ø      :REM*138
5Ø      :REM*152
6Ø      :REM*196
7Ø      :REM*148
8Ø      :REM*236
1ØØ     :REM*118
11Ø     :REM*19Ø
115     :REM*229
12Ø     :REM*18Ø
125     :REM*217
13Ø     :REM*126
135     :REM*245
14Ø     :REM*216
145     :REM*145
15Ø       :REM*Ø
16Ø     :REM*176
17Ø      :REM*1Ø
175     :REM*2Ø3
18Ø     :REM*138
185     :REM*131
19Ø      :REM*68
2ØØ      :REM*46
21Ø     :REM*198
22Ø      :REM*22
23Ø     :REM*162
24Ø      :REM*42
3ØØ     :REM*1Ø3
3Ø5     :REM*174
31Ø     :REM*215
315      :REM*7Ø
32Ø     :REM*175
325     :REM*142
33Ø      :REM*73
335     :REM*186
34Ø      :REM*73
345      :REM*32
35Ø      :REM*91
355     :REM*1Ø4
36Ø     :REM*115
365      :REM*68
375     :REM*18Ø
38Ø     :REM*235
385     :REM*174
39Ø     :REM*187
395     :REM*124
4ØØ     :REM*137
4Ø5     :REM*17Ø
41Ø     :REM*213
415     :REM*142
42Ø     :REM*1Ø7
425     :REM*124
43Ø     :REM*149
435     :REM*242
44Ø      :REM*17
445     :REM*248
45Ø     :REM*233
455      :REM*4Ø
46Ø     :REM*199
465       :REM*Ø
47Ø     :REM*127
475      :REM*22
48Ø       :REM*5
485      :REM*32
49Ø     :REM*243
495      :REM*56
5ØØ     :REM*229
51Ø      :REM*37
52Ø      :REM*38
53Ø     :REM*194
54Ø       :REM*Ø
55Ø       :REM*6
6ØØ       :REM*6
61Ø     :REM*214
62Ø     :REM*186
63Ø     :REM*1Ø8
65Ø     :REM*254
655     :REM*241
66Ø     :REM*1Ø8
665     :REM*143
67Ø      :REM*38
675     :REM*241
68Ø      :REM*92
685     :REM*2Ø9
7ØØ     :REM*1Ø2
71Ø     :REM*154
72Ø     :REM*248
73Ø      :REM*54
74Ø      :REM*2Ø
75Ø     :REM*222
76Ø     :REM*14Ø
8ØØ      :REM*65
81Ø     :REM*153
82Ø     :REM*155
83Ø      :REM*15
84Ø      :REM*81
85Ø      :REM*33
855      :REM*82
86Ø     :REM*245
87Ø     :REM*147
88Ø     :REM*173
89Ø      :REM*17
9ØØ     :REM*193
91Ø     :REM*2Ø5
92Ø      :REM*41
93Ø     :REM*111
94Ø     :REM*153
95Ø     :REM*143
96Ø      :REM*41
97Ø      :REM*59
98Ø     :REM*2Ø7
99Ø      :REM*49
995      :REM*96
1ØØØ     :REM*59
1Ø1Ø     :REM*213
1Ø2Ø      :REM*71
1Ø3Ø      :REM*8Ø
1Ø4Ø     :REM*136
```

A Dozen Will Do It, by Ronald Greenberg; June, p. 94.

Listing 1.

```
1ØØ     :REM*138
11Ø      :REM*62
12Ø     :REM*17Ø
13Ø     :REM*22Ø
14Ø      :REM*4Ø
15Ø     :REM*224
16Ø       :REM*4
17Ø     :REM*12Ø
18Ø      :REM*82
19Ø      :REM*68
2ØØ     :REM*228
21Ø     :REM*182
22Ø     :REM*17Ø
23Ø     :REM*2Ø4
24Ø     :REM*222
25Ø     :REM*1Ø6
26Ø      :REM*19
27Ø      :REM*95
28Ø      :REM*71
29Ø       :REM*5
3ØØ     :REM*255
31Ø     :REM*137
32Ø      :REM*75
33Ø     :REM*165
34Ø     :REM*151
35Ø     :REM*117
36Ø     :REM*199
37Ø       :REM*7
38Ø       :REM*9
39Ø     :REM*213
4ØØ     :REM*1Ø7
41Ø     :REM*235
42Ø     :REM*213
43Ø     :REM*2Ø5
44Ø       :REM*9
45Ø     :REM*215
46Ø     :REM*179
47Ø     :REM*185
48Ø      :REM*93
49Ø      :REM*17
5ØØ     :REM*213
51Ø      :REM*19
52Ø      :REM*42
53Ø      :REM*9Ø
54Ø      :REM*14
55Ø     :REM*176
56Ø      :REM*5Ø
57Ø     :REM*184
58Ø     :REM*134
59Ø     :REM*254
6ØØ     :REM*19Ø
61Ø      :REM*66
62Ø     :REM*2Ø4
63Ø     :REM*136
64Ø      :REM*2Ø
65Ø     :REM*194
66Ø      :REM*22
67Ø     :REM*118
68Ø      :REM*1Ø
69Ø     :REM*11Ø
7ØØ     :REM*1Ø2
71Ø     :REM*1ØØ
72Ø     :REM*14Ø
73Ø     :REM*148
74Ø      :REM*22
75Ø     :REM*138
76Ø      :REM*14
77Ø     :REM*169
78Ø      :REM*23
79Ø      :REM*41
8ØØ     :REM*175
81Ø     :REM*183
82Ø     :REM*135
83Ø     :REM*145
84Ø     :REM*139
85Ø     :REM*187
86Ø      :REM*43
87Ø      :REM*23
88Ø      :REM*31
89Ø      :REM*15
9ØØ     :REM*215
91Ø     :REM*137
92Ø     :REM*127
93Ø      :REM*23
94Ø      :REM*21
95Ø      :REM*57
96Ø     :REM*227
97Ø     :REM*179
98Ø     :REM*139
99Ø      :REM*33
1ØØØ     :REM*141
1Ø1Ø     :REM*2Ø1
1Ø2Ø      :REM*79
1Ø3Ø      :REM*12
1Ø4Ø     :REM*254
1Ø5Ø     :REM*198
1Ø6Ø     :REM*224
1Ø7Ø      :REM*92
1Ø8Ø      :REM*72
1Ø9Ø      :REM*26
11ØØ      :REM*96
111Ø      :REM*42
```

Listing 1 continued.

```
112Ø    :REM*184
113Ø     :REM*18
114Ø    :REM*1Ø8
115Ø    :REM*198
116Ø     :REM*34
117Ø    :REM*124
118Ø    :REM*184
119Ø    :REM*132
12ØØ     :REM*2Ø
121Ø    :REM*192
122Ø    :REM*1Ø6
123Ø     :REM*2Ø
124Ø    :REM*19Ø
125Ø    :REM*1Ø6
126Ø     :REM*42
```

Listing 2.

```
1Ø       :REM*Ø
2Ø      :REM*19Ø
3Ø      :REM*238
4Ø       :REM*26
5Ø      :REM*188
1ØØØ    :REM*127
1Ø12    :REM*189
1Ø24      :REM*Ø
1Ø36    :REM*254
1Ø48     :REM*54
1Ø6Ø     :REM*52
1Ø72    :REM*2ØØ
1Ø84    :REM*134
1Ø96     :REM*22
11Ø8    :REM*134
112Ø     :REM*5Ø
1132    :REM*184
1144    :REM*182
1156     :REM*18
1168    :REM*116
118Ø    :REM*112
1192     :REM*32
12Ø4     :REM*7Ø
1216    :REM*158
1228    :REM*124
124Ø     :REM*66
1252     :REM*68
1264    :REM*22Ø
1276    :REM*198
1288    :REM*1Ø3
```

Bad Blocks?, by Joseph Shaughnessy; June, p. 66.

```
1Ø       :REM*72
2Ø       :REM*7Ø
3Ø      :REM*188
4Ø       :REM*9Ø
5Ø      :REM*156
6Ø      :REM*11Ø
7Ø      :REM*216
8Ø      :REM*13Ø
9Ø      :REM*152
1ØØ     :REM*118
11Ø     :REM*116
12Ø     :REM*112
13Ø      :REM*42
14Ø      :REM*18
15Ø     :REM*2Ø8
16Ø      :REM*24
17Ø      :REM*42
18Ø      :REM*46
19Ø     :REM*224
2ØØ      :REM*76
21Ø     :REM*176
22Ø     :REM*248
23Ø      :REM*18
24Ø     :REM*148
25Ø     :REM*122
26Ø     :REM*219
27Ø       :REM*3
28Ø      :REM*19
29Ø      :REM*83
3ØØ     :REM*247
31Ø     :REM*249
32Ø      :REM*61
33Ø     :REM*139
34Ø      :REM*19
35Ø      :REM*51
36Ø     :REM*163
37Ø      :REM*39
38Ø      :REM*99
39Ø      :REM*47
4ØØ     :REM*197
41Ø       :REM*1
42Ø      :REM*97
43Ø      :REM*15
44Ø     :REM*211
45Ø     :REM*213
46Ø       :REM*9
47Ø      :REM*95
48Ø     :REM*1Ø5
49Ø     :REM*113
5ØØ     :REM*237
51Ø     :REM*177
52Ø     :REM*158
525      :REM*161
53Ø      :REM*14
54Ø     :REM*22Ø
55Ø      :REM*98
56Ø     :REM*2ØØ
57Ø      :REM*56
58Ø     :REM*128
59Ø     :REM*132
6ØØ      :REM*7Ø
61Ø     :REM*16Ø
62Ø      :REM*54
63Ø     :REM*134
64Ø      :REM*48
65Ø     :REM*226
66Ø     :REM*114
67Ø      :REM*62
68Ø      :REM*44
69Ø     :REM*222
7ØØ     :REM*1ØØ
71Ø      :REM*58
72Ø      :REM*86
73Ø      :REM*3Ø
74Ø     :REM*24Ø
75Ø     :REM*238
76Ø     :REM*25Ø
77Ø     :REM*243
78Ø       :REM*5
79Ø       :REM*7
8ØØ     :REM*1Ø5
81Ø     :REM*137
82Ø     :REM*217
83Ø      :REM*41
84Ø     :REM*1Ø7
85Ø     :REM*117
86Ø     :REM*237
87Ø      :REM*53
88Ø      :REM*75
89Ø     :REM*1Ø1
9ØØ     :REM*2Ø3
91Ø      :REM*31
92Ø      :REM*55
93Ø     :REM*245
94Ø     :REM*173
95Ø     :REM*113
96Ø     :REM*187
97Ø      :REM*13
98Ø     :REM*161
99Ø      :REM*33
1ØØØ     :REM*53
1Ø1Ø    :REM*197
1Ø2Ø     :REM*71
1Ø3Ø    :REM*152
1Ø4Ø     :REM*18
1Ø5Ø    :REM*162
1Ø6Ø    :REM*172
1Ø7Ø     :REM*98
1Ø8Ø    :REM*144
1Ø9Ø    :REM*218
11ØØ    :REM*168
111Ø    :REM*162
112Ø    :REM*162
113Ø    :REM*168
114Ø     :REM*16
115Ø     :REM*12
116Ø     :REM*58
117Ø      :REM*5Ø
118Ø    :REM*132
119Ø    :REM*116
12ØØ    :REM*228
121Ø    :REM*21Ø
122Ø      :REM*6Ø
123Ø    :REM*21Ø
124Ø    :REM*184
125Ø     :REM*58
126Ø    :REM*146
127Ø    :REM*2Ø4
128Ø    :REM*1Ø5
129Ø    :REM*133
13ØØ    :REM*147
131Ø    :REM*2Ø9
132Ø     :REM*69
133Ø     :REM*13
134Ø    :REM*153
135Ø    :REM*1Ø3
136Ø    :REM*161
137Ø     :REM*75
138Ø    :REM*179
139Ø    :REM*137
```

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.

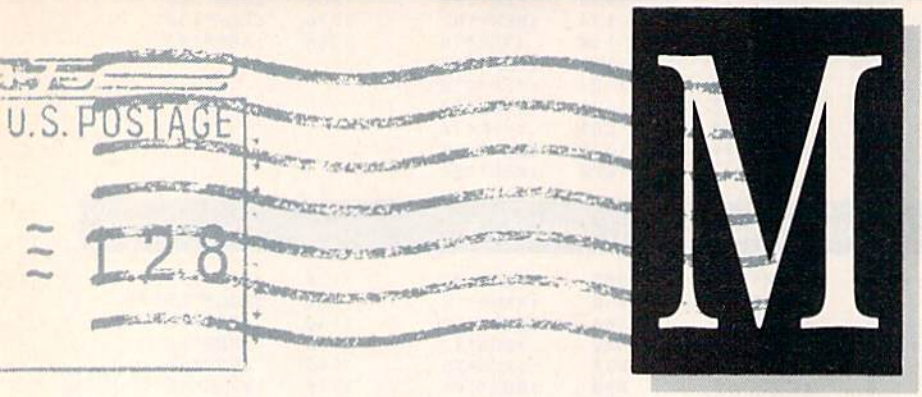
EPROM ERASERS:

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



Patchwork Computing

I have thoroughly enjoyed your *RUN* magazine as the best all-around publication for Commodore computers. The many articles, Commodore Clinic, Mail RUN, even the ads have been a tremendous help to this new computer enthusiast.

I have typed in Mike Konshak's Datafile program with all its additions and was surprised and delighted when it not only worked to perfection, but greatly speeded up my own magazine's subscription listings and solved my renewal problems. I can't thank you enough—both your magazine and Mr. Konshak.

Now, I have a request. I'd like a program that would utilize Commodore's graphics capabilities by allowing me to create and print out quilt designs. Such a program could be used for many other applications beyond quilt design.

The program should be able to figure quilt-block sizes and to compute in inches a full-sized quilt (such as 80 × 100 = 24 complete blocks, etc.). Are there any programmers out there who have written such a program or would be willing to write one for this purpose?

Joan Emerson, Editor
Rogue's Gallery
Route #1
Cushing, WI 54006

Educating Teachers

I read with interest Margaret Morabito's education column, The Resource Center, in your February 1986 issue. My situation is not unlike the one at the Winchester school.

I also have a network of Commodore 64s in my classroom. I use the VIC Switch, Prowriter 8510A, Tymac's The Connection interface and eight C-64 computers. We are having great success with them, with both special education students and the general school population.

Due to the lack of software that would effectively utilize the network, I finally had to write my own programs and modify others to access all the features of the network, especially the printer. Several other teachers joined me in this project. This often meant modifying various public domain programs to make them fit the network. The result of this effort was the development of some very useful programs for elementary school students in math, reading and spelling.

Two of these programs, Quick Math and Quick Read, involve timing the students during specific drill in math and reading. We have been using the math program as a criterion reference screening test for the entire school—grades 1–6. Both programs have the ability to print out the results of each student's progress to the printer. This provides immediate feedback to the students and their teachers. I now have other schools using the program with success.

I think it would be great to receive more information from others like myself who have either developed or are using some excellent programs on their network. I would be willing to trade my work for theirs.

Rod B. Blaylock
Cloverdale Elementary School
3999 Greenwillow Ave.
Idaho Falls, ID 83401

I was very pleased to see Margaret Morabito's education column. Since receiving C-64s in November of 1983, I have spent an extremely frustrating two years trying to make constructive educational use of them. I have written to several publications concerning educational applications of computers—with little satisfaction. If I got any reply at all, it was a polite, "we don't have time for this topic." A few individuals and small businesses have been most helpful.

I hope that this column can exert an influence that will convince educators, other publishers and "the powers that be" at Commodore of the educational potential and value in Commodore computers. I firmly believe that the C-64 is the best computer buy for both education and personal use.

Leon Sullivan
Madisonville, KY

A Criminal Use

I am involved in the Wilkes-Barre Crime Prevention Unit, which is headed by Lt. Jerry Cookus, the president of the Pennsylvania Crime Prevention Officers Association.

For the past several months, our unit has been using a C-64 system to help us solve local crimes. Our police department has about 100 members, and we know, for the most part, who the bad guys are. The problem is that we don't know each problem case and often have to consult with one another about a suspect. This could take days. Our C-64 supplies us with the necessary information within seconds.

We are currently using a burglary file, a theft file and a suspect file. I

wrote these files with the help of a fine database, modified for crime-prevention purposes. I would like to speak with others who are using a microcomputer for similar applications. I'd like to see if we could combine efforts to develop a super system.

For those of you interested, contact Lt. Cookus, c/o Wilkes-Barre Police Department, Special Services, 35 North Washington St., Wilkes-Barre, PA 18701.

James J. Scutch
Wilkes-Barre, PA

Name Change

Thank you for listing our music program, Virtuoso, in the Software Buyer's Guide in your January 1986 issue. Unfortunately, the name we had chosen was already a registered trademark of Enhanced Technology Associates, Inc. Therefore, we have changed the name of our product to Euphony.

Jim Raymond
TOC Software
Fairbanks, AK

User's Group Corrections

In your 1986 Special Issue, the address for our club, the Commodore Houston User's Group, is incorrect. The correct address is PO Box 612, Tomball, TX 77375.

The modem number for our free, non-restricted BBS is 713-433-6395. The voice number for current meeting information is 713-630-3502.

Mary F. Howe, President
Commodore Houston User's Group

Please note that on p. 170 of your 1986 Special Issue, the telephone number listed under Commodore User's Group of Rochester is incorrect. The only means of contacting this group is by writing to PO Box 26514, Rochester, NY 14626.

Kathy Foley
Rochester, NY

Commodore Overseas

Please add our name to your list of overseas Commodore user's groups. We are a small but active group situated on the west coast of North Island, 50 miles north of Wellington.

We have been formed now for almost two years and have a membership of 98 C-64 and VIC-20 users; the C-128 has only just arrived on the market here, so we should have some users in the near future.

Any clubs in the United States who are interested in exchanging their publications with our publication, *SYNTAX ERROR?*, should contact us.

Murray E. Nicolson
Kapiti Commodore User's Group
16a Cypress Grove
Paraparaumu, New Zealand

Circle 172 on Reader Service card.

NEW
for the Commodore 128
DON'T GIVE UP YET!
BACK UP
virtually all 64/128
Software with
NEW 1571 Clone*



Months of R&D have gone into the GCR CLONE MACHINE™ for 1571. Now you have the ability to reproduce GCR signals to back up virtually all software for the 64/128 including CPM (double sided too!). Included are:
1) Full Density Utility 2) GCR Copy 3) Directory Utilities 4) Auto Boot Maker (64&128 Modes) 5) Expansion module section (for future updates).
ALL THIS for only $49.95

PRINTER INTERFACE
The MW-350 interface has been revised to fully support the 128 including complete CPM emulation total graphics, correct aspect ratios, print buffer, etc. Insist on compatability for only $79.00

MIDI APPLICATIONS
Synthesizers, Interfaces, Music Disks, Sequencer Software, Etc.

CALL - 201 - 838-9027
or write us at
Micro-W. DISTRIBUTING, INC
1342B Route 23 Butler, N.J. 07405
(requires 128 with 1571 drive)

Circle 101 on Reader Service card.

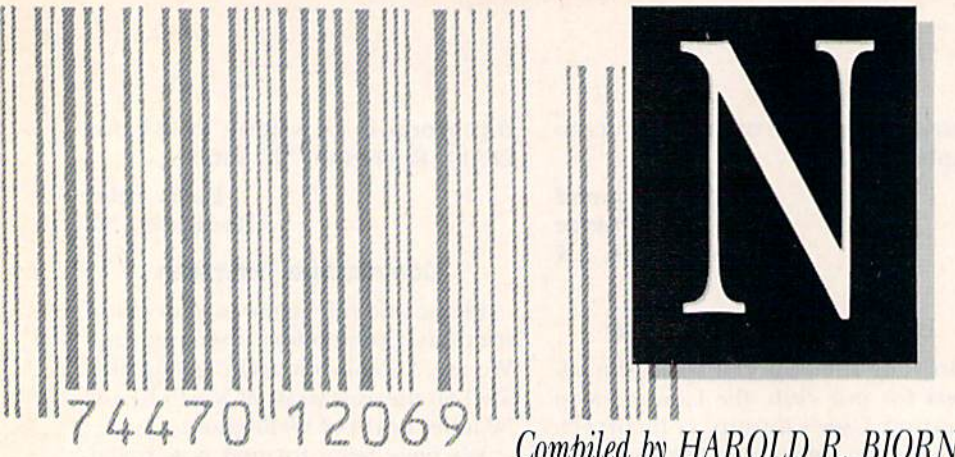
BUSINESS • SCIENCE • EDUCATION
The complete statistical package for only: $99

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!



Compiled by HAROLD R. BJORNSEN

For Amway Product Distributors

Soft-pack is a multidisk software package for the beginner up to the Diamond Direct distributor.

The Product Order program allows you to order up to 1500 products per order and select them from over 860 products on file. Features include PV/BV and product order accumulations, variable handling-charge rates, hard-copy capabilities, up to 100 individual distributor files and variable state tax status for products and distributors.

The Expense/Home Budget program stores up to 2000 records for accurate accounting of business expenses and income ledgers. Available for the C-64 for $150. Uptown Enterprises, PO Box 226, Verona, VA 24482.

Check Reader Service number 400.

Chartpak-128

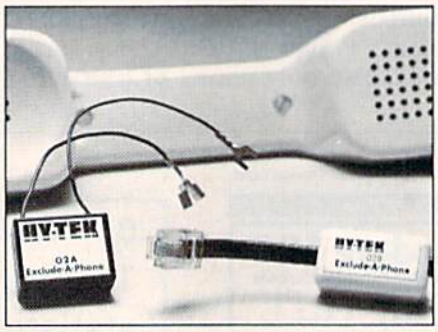
Now you can get the Chartpak for your C-128, the software that lets you create charts and high-resolution graphics without the need for any programming.

Chartpak-128 has the same data entry and data maintenance features as the C-64 version, and you can use the program's defaults to build professional-quality charts and graphs, or you can build them to your own specifications.

With your C-128, you get three times the resolution of the C-64 version, and you can view an entire chart or graph or scroll the screen to see the higher-resolution detail.

Chartpak-128 takes advantage of the extra memory of the C-128 so you can enter more data from which to build your charts. Available on disk for $39.95 from Abacus Software, 2201 Kalamazoo SE, PO Box 7211, Grand Rapids, MI 49510.

Check Reader Service number 404.



Exclude-A-Phone, from Hy-Tek.

Exclude-A-Phone

Tired of having someone pick up an extension phone and ruin your computer transmission? You can prevent this with Exclude-A-Phone, from Hy-Tek (c/o R. K. Burtchaell Co., 516 SE Morrison, Suite 201, Portland, OR 97214).

Exclude-A-Phone blocks an extension phone from interfering when the line is already in use. Installing the device is easy, and, if you wish, it may be kept out of sight. Available for $23.95.

Check Reader Service number 401.

"Freeware" from Florida

The Sharewaire Disk Volume 1 begins a series of "freeware" from Serendipity Software (8438 Lynda Sue Lane West, Jacksonville, FL 32217).

Volume 1 includes a fast-loading automatic menu program, a program for making disk envelopes, a postage scale program, a return-address label program, a crib-sheet program to use with the function keys on your C-64 or C-128 and a program that adds 15 commands to Basic to aid you in writing, entering and debugging Basic programs.

Sharewaire Disk Volume 1 is available for $15.

Check Reader Service number 402.

A Current Release

Lincad, a linear electronic circuit analysis and design program, has been released by Sofcad Electronics (PO Box 21845, Columbus, OH 43221).

The program has over 12 features, including interactive design, circuit optimization, ac worst-case analysis, minimization/maximization of circuit parameters and mechanical and electromechanical systems analysis.

The disk and manual are available for the C-64 for $49.

Check Reader Service number 405.

Headwipes

Headwipes, a pre-moistened applicator of nonabrasive, 100% rayon, cleans all disk drive pickups and recording heads (audio and video), tape guides, capstans and rollers, PC-board contacts and any components that need cleaning.

The applicator contains a solvent that dissolves dirt and oxides and evaporates without leaving a film or residue on components.

Headwipes is available in packages of ten for $3.75. Headwipes, PO Box 1125, Burbank, CA 91507.

Check Reader Service number 406.

Temperature Scanner

Electroworks (Bldg. One, Brown Road, Cornell Research Park, Ithaca, NY 14850) introduces its Model 20 two-channel temperature scanner for the C-64. The scanner's two program-selectable input channels measure temperatures from −20°C to 100°C, with an accuracy of ±0.5°C.

You can program your computer to display temperature in Fahrenheit or Celsius, record temperatures at predetermined intervals, set audible alarms for high/low limits and display and record the temperature differential between the scanner's two probes. Available for a cool $179.

Check Reader Service number 403.



Electroworks' Temperature Scanner.

Commodore Flea Market

The Price Buster (CAT Systems Publishing, 21115 Devonshire St., Chatsworth, CA 91311) is a monthly nationwide publication that lists computer equipment for sale by private parties.

You can place your ad via modem or the magazine's CompuServe or MCI mailbox. *The Price Buster* also publishes articles and programs. A one-year subscription (12 issues plus one free issue) is available for $9.

Check Reader Service number 412.

Baseball Stats Aid

The 43rd Street Software Shop (720 43rd St., Ashland, KY 41101) introduces At Bat Stats 64, a baseball statistics program for the C-64. Managers and coaches can track their team's performance during the season, and players can track their individual performances, including innings played, total at-bats, batting averages, slugging percentages, singles, doubles, triples, home runs and runs batted in.

In addition, At Bat records data for up to 162 games and 40 players, changes and reviews game and player data, prints out your team's schedule, team record, team season summary, and player and game summaries. Available on disk for $22.95.

Check Reader Service number 407.

Office Ensemble

A new line of computer furniture for your office, the Oak 160 Series from Bush Industries (PO Box 460, Jamestown, NY 14702), is made entirely of solid oak and oak laminates. Each piece features a distinctive pattern of accent lines and a hand-rubbed lacquered finish.

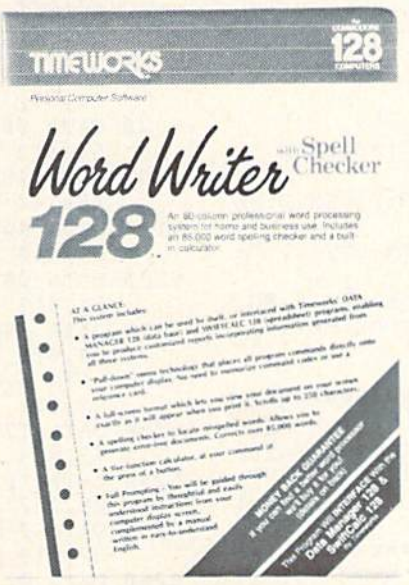
Included in this ensemble are a desk (which sets the keyboard at a 27-inch height and provides a 50- × 29-inch work surface; $199.95), a pedestal (which can be added to the desk to increase storage space; $140), a hutch (which has storage space for software, binders and accessories; $199.95) and a printer stand (which contains two top paper slots for both rear- and bottom-feed printers; $159.95).

Check Reader Service number 413.

Enhanced Word Writer 128

Timeworks (444 Lake Cook Road, Deerfield, IL 60015) has released an enhanced version of its Word Writer 128 program for the C-128.

The upgraded program, an 80-column professional word processing system for home and business use, works in 128 mode with either a 40- or 80-column monitor.



Timeworks' Enhanced Word Writer 128.

Additional features now include on-screen highlighting, which allows your printer to underline, italicize, boldface or use all three together and to view each highlight on-screen before printing out a hard copy; superscripts and subscripts; headers and footers; and speed keys, which let you access Word Writer's commands in a hurry.

The enhanced Word Writer 128 is available on disk for $69.95.

Check Reader Service number 408.



Printout of a musical composition (not to scale), using Dayline Software's Music Magic program.

Magical Musical Tour

Music Magic, a music composition program, releases the musical capabilities of your C-64 to your control.

You can create music and then listen to it as your computer plays it back and displays it on the screen. Then, with the Edit Song command, you can delete, add and replace notes and rests.

With Music Magic, you can also control both tempo and volume and design your own sounds. Available on disk for $30 from Dayline Software, PO Box 305, Ames, IA 50010.

Check Reader Service number 409.

A Monitor for Your C-128

C. Itoh Digital Products (19750 South Vermont, Suite 220, Torrance, CA 90502) introduces its CM1000 monitor, with both composite and RGB capabilities and a full-range speaker.

In Composite mode, the CM1000 provides the maximum resolution of 320 × 240, with a four MHz bandwidth. The RGB mode provides a resolution of 640 × 240, with a 15 MHz bandwidth.

The monitor can also be connected to your VCR or other video source. It is available for your C-128 for $499.

Check Reader Service number 411.

How to Type in C-64 and C-128 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 program 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,ØØ8,2Ø1,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
```

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.

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*; 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*.

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 AMOK

Item: There is a bug in Michael Broussard's Lister program (Add Elegance to Your Program Listings, January 1986, p. 74). The Commodore graphics characters contained within quoted strings do not get printed properly. This can be corrected by adding the following lines to the Lister Basic loader:

```
185 POKE 49523,76 : POKE 49524,56 : POKE 49525,199
187 FOR K = 51000 to 51009 : READ N : POKE K,N : NEXT
1700 DATA 208,4,138,76,118,193,138,76,232,193
```

Lister also does not work properly for a program that has multiple NEXT statements for a single FOR. Turning off Lister's loop-indentation feature solves this problem; this is accomplished by adding this line to the Basic loader:

```
188 POKE 49540,0 : POKE 49624,0
```

Item: There was an omission from a line of code in Commodore Clinic for March 1986. In the answer at the bottom of column 1, p. 101, the Print statement should read:

PRINT#15"N0:DISK NAME,##"<return>

Item: Our attention has been called to a minor error in the listing of the Home Run Derby program (December 1985, p.34). In line 250, RE>BE should read RE>BL. The error doesn't interfere with the game play, but causes "GOOD GAME RED" to appear after the last inning, whether or not Red is the winner.

Attention Subscribers

We occasionally make our mailing list available to other companies or organizations with products or services which we feel might be of interest to you. If you prefer that your name be deleted from such a list, please fill out the coupon below or affix a copy of your mailing label and mail it to:

CW Communications/Peterborough
RUN
PO Box 954
Farmingdale, NY 11737

Please delete my name from mailing lists sent to other companies or organizations. RUN

Name _____
Address _____
City _____ State _____ Zip _____

List of Advertisers

Reader Service		Page
8	Abacus Software	63, 65
79	Aprotek	23
210	Aprotek	66
163	Avantgarde 64	101
157	Basix Softworxs	45
*	Batteries Included	37
134	Berkley Softworks	85
14	Brady Computer Books	59
213	Carnival House	60
85	Cardco, Inc.	CIII
192	Cardinal Software	95
123	C.E.D.	101
81	Central Point Software	20
*	C.O.M.B.	99, 101
*	Computer Ctrs. if America	2, 3
55	Computer Creation	75
109	COSMI	11
*	Commodore Business Machines	CIV
*	Covox, Inc.	66
198	Crown Custom Covers	22
105	Data Share, Inc.	57
157	D.B. Software	22
156	Emerald Components	89
12	Epyx, Inc.	15
84	Federal Hill Software	81
71	Firebird Software	17
99	Firebird Software	43
107	Firstline Software Inc.	79
144	Free Spirit Software	99
*	GE Information Services	55
9	H&E Computronics	77
202	Jason-Ranheim	105
126	Ketek	31
*	Lyco Computer	73
19	Megasoft Ltd.	CII, 1
189	Megasoft Ltd.	46, 47
172	Micro W.D.I.	107
177	Micro World Electronics	98
68	Microprose	29
60	Omnitronix	99
*	Pro-Line Software	71
93	Professional Softare	19
74	Prof. Jones Frogg House	66
15	Protecto Enterprizes	82, 83
*	Pro-Line Software	71
15	Protecto Enterprizes	58, 59
*	Quantum Link	24, 25
220	Quinsept Inc.	20
*	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	101
66	Software Dimension	87
254	Software Discounters of America	91
137	Solid State Software	7
101	Stat Soft	107
25	Strategic Simulations	39
26	SubLogic	21
122	Sunrise Software	99
223	T & D Electronics	49
155	Tenex Computer Express	53
2	Timeworks	9
209	Tussey Computer Products	12, 13
132	Ultrabyte, Inc.	89
121	Value Soft	61
205	Video Files	101
151	Wilanta Arts	99
42	World Trade Electroncis	97
77	X-10 Powerhouse	41
96	Xetec, Inc.	100

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.

June

COMING ATTRACTIONS

■ **Review of GEOS**—You'll want to know about this exciting new operating system Berkeley Software has produced for the C-64. GEOS offers icons, pull-down menus and windowing features.

■ **Educational Computing**—Next month's issue will feature an interesting section on education and computers:

—C-64 Goes to Second Grade. Learn how one second grade teacher is motivating her students to learn through creative uses of the C-64.

—Education in Canada. Commodore has a strong hold on Canada's education market and shows no signs of letting go. Find out the company's secrets.

—Arithme-Sketch. This unique math program rewards correct answers with free drawing time.

—What does it mean to be a manufacturer of educational software in a rapidly expanding market? You'll find the answers to this and similar probing questions in an interview with the vice-president of Grolier Electronic Publishing.

■ **More on Printers**—*RUN* technical editor Tim Walsh takes a final look at printers for the Commodore computer, to help you determine the one that best suits your needs.

Technical Breakthrough #29



What you see is what you get!

You're playing HitchHiker's Guide to the Galaxy™, and you're presented with an option never before revealed to the human life form. You know, when you hit the key, it's going to be gone for all eternity. What do you do?

Freeze Frame!

It takes an instant "snapshot" of your screen. Dumps it to your printer, so you can file it for future reference . . . and returns you to the game, **exactly where you left off!**

Works with...	Freeze Frame	Other Screen Dumps
Disk programs	Yes	Sometimes
Cartridge programs	Yes	Seldom
All programming languages	Yes	No
Absolutely everything	Yes	No way

Freeze Frame is Cardco's greatest technical breakthrough yet. It is the first **totally transparent** screen dump utility for Commodore computers. We mean absolutely, positively, 100% TRANSPARENT . . . to **any** program in **any** language. Period. As if that weren't enough, **Freeze Frame** also gives you . . .

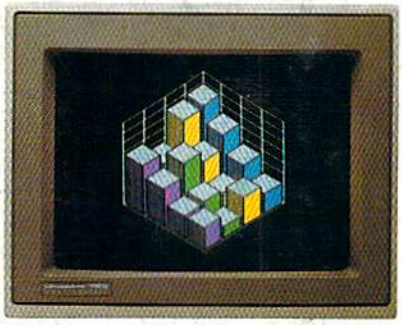
- **Cartridge-based program for instant-on (with female connector for chaining cartridges)**
- **Standard, Reverse, and Mirror imaging**
- **Multiple printer adaptability. Works on any printer or printer interface combination that emulates Commodore 1525 operation! High-speed options are included for Epson-compatible and Okidata-compatible printers.**

The Wizards from the Land of Oz Have Done It Again!

CARDCO, Inc. / 300 S. Topeka / Wichita, KS 67202

Circle 85 on Reader Service card.

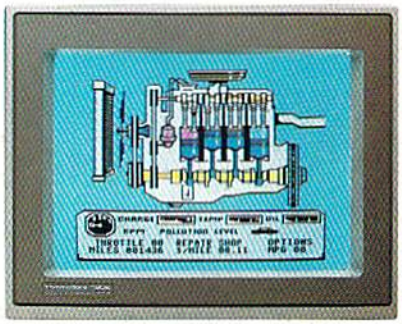
All you need to do this



graph a spreadsheet



write a novel



fix an engine



compose a song



paint a picture



your banking



learn to fly



organize a data base



tell a story



forecast sales



When it comes to personal computers, you want the smartest, at a price that makes sense.

The new Commodore 128™ system has a powerful 128K memory, expandable by 512K. An 80-column display and 64, 128 and CP/M® modes for easy access to thousands of educational, business and home programs. And a keyboard, with built-in numeric keypad, that operates with little effort.

Or if the Commodore 128 is more machine than you had in mind, you can pick up the Commodore 64.® The Commodore 64 is our lower-priced model geared to more fundamental, basic needs.

Discover personal computers that do more for you. At prices you've been waiting for. From the company that sells more personal computers than IBM® or Apple.®

© 1985, Commodore Electronics Limited
® CP/M is a registered trademark of Digital Research, Inc.
® Apple is a registered trademark of Apple Computer, Inc.
® IBM is a registered trademark of International Business Machines Corporation
® Commodore 64 is a registered trademark of Commodore Electronics, Ltd.

COMMODORE 128 AND 64 PERSONAL COMPUTERS

A Higher Intelligence