

**SPECIAL ISSUE**

**FREE  
COMPUTER CALENDAR  
INSIDE**

# **RUN**

1988 A CWC/I Publication  
Display until January 12  
U.S.A. \$3.95

**THE COMMODORE 64/128 USER'S GUIDE**

## **HOLIDAY GIFT GUIDE**

**The BEST  
Of Commodore  
Clinic**

**1987 MAGIC—  
Over 200 Helpful  
Hints and Tips**

**Plus:**

- ▶ **Type-in Applications  
And Utilities**
- ▶ **Commodore Service Center List**





# FEEL THE HEAT



No matter what kind of game you're in the mood for, you'll find that if it's in a box marked FIREBIRD, it's really hot!

Firebird offers the excitement of a whole range of challenges — Adventures and Strategies for long rainy weekends, Arcade games for exhilarating evenings, Simulations when you need to get away from it all, Productivity software when you're feeling — well, productive.

Look for the Firebird — it stands for top-quality software in virtually every category.

## How About This Ball of Fire From Firebird!

This is SENTRY, a unique Strategy game with over 10,000 full-color 3D vector landscapes and four-way scrolling. Do you have truly exceptional concentration and near perfect

hand/eye coordination? Then maybe — just maybe — you possess the skill to outwit the Sentry at each level of the extraordinary challenge.

## Firebird Fireworks Unlimited

When your mood shifts from the deliberation of strategic planning to the excitement of fast-paced Arcade action, look for Firebird's ELITE, a unique game which encompasses the best of both worlds. Or try STARGLIDER, an amazing 3D combat flight simulation.

If it's Adventure you're after, here's the breathtakingly illustrated GUILD OF THIEVES, with its revolutionary text-handling system.

Firebird even offers economical, professional-quality Productivity software! ADVANCED ART STUDIO is a comprehensive art package with powerful graphics routines.

This is Firebird — the best in interactive software of every description. We'll prove to you that you don't have to keep switching brands to satisfy your obsession for challenge!

CREDIT CARD HOTLINE  
(201) 444-5700



"The First Full Line In Software"

Firebird Licensees, Inc.  
P.O. Box 49, Ramsey, NJ 07446  
(201) 444-5700

Firebird software for Commodore 64 systems, including the popular Golden Path, Pawn, Colossus Chess IV, Cholo, Talking Teacher, Concise Music System and Advanced Music System, is available from \$24.95 to \$59.95.



“...one of the very best\*...”

Write • File • Organize • Analyse • Track • Compare • Search • Graph • Report • Create • Sort  
Solve • Calculate • Integrate • Express • Cut & Paste • Modify • Proof • Display • Report

You can do almost anything.

**You can do it. You really can.**

These are all of the wonderful things you can do with your Commodore 64 or 128 and Pocket™ 2 Software. This is the software that can make you an ace in 30 minutes... even if you've never touched a computer before.

The reason? Pocket™ 2 Software is menu driven. It has all of the help and instructions you need right on the screen. All of the power of your computer is right there at your fingertips. It's such an exhilarating feeling, you might find yourself humming the theme to 'Rocky'.

**Fast, flexible and affordable.**

At Digital Solutions, we're committed to making our software work for you. Naturally, all Pocket™ 2 software is fully integrated and GEOS™ compatible. It's people logical... not just machine logical.

All those wonderful things you've heard about Pocket™ 2 Software are true. Just wait until you get your hands on it.

**Digital Superpak™ 2 ... A super idea**

One of the beauties of Pocket™ 2 Software is that all three programs work beautifully together. Working together, they're more powerful and give you a whole new range of options and possibilities.

Not only that, when you order Pocket Writer™ 2, Pocket Planner™ 2 and Pocket Filer™ 2 bundled together in Digital Superpak™ 2, you can save a bundle of money. Just \$99.95 U.S.

**Pocket Writer™ 2 The Award Winner**

Experts call Pocket Writer™ 2 the best word processor ever. With its menu-driven, on-screen instructions, you'll fly through letters, presentations, memos, lists, reports and articles. In fact, if you need to write it, Pocket Writer™ 2 will make it easier. You can format your words the way you want them. You can change your mind. You can even stay on top of your spelling with Spelling Checker. Only \$59.95 U.S.

**Pocket Filer™ 2 ... like a giant file drawer**

Pocket Filer™ 2 is a full-featured database that will help you to keep track of just about anything. No matter what kind of information you have to store, Pocket Filer™ 2 will help you to organize it better, process it in more ways and retrieve it faster when you need it.

At home or at the office, now you can organize information the way you want it. Only \$59.95 U.S.

**Pocket Planner™ 2 It figures**

Pocket Planner™ 2 is the answer for number crunchers. This powerful electronic spreadsheet is the right tool for collecting, storing, analysing and reporting information... financial or numerical. It's a common-sense solution for managing your checkbook, budget, installment payments, worksheets or investment portfolio. Pocket Planner™ 2 lets you put some real bite into your number crunching. Only \$59.95 U.S.

\*Commodore Magazine, July 1987

**Pocket Planner™ 2**

Professional Spreadsheet for the Commodore 128 and 64

- Pocket 2 Software has 128 on one side and 64 on the other
- Spreadsheet printing — no need for a separate program
- Graphical printing for bar, pie and line can be displayed, printed and stored with Pocket Writer 2
- Customized help at any time
- Smart evaluation that saves memory
- Accuracy to 18 digits — 8 more than most spreadsheets

Serious software that's simple to use.

**Pocket Writer™ 2**

Professional Word Processor for the Commodore 128 and 64

- Pocket 2 Software has 128 on one side and 64 on the other
- On-screen text formatting and word storage. What you see is what you get!
- On-screen text editing including boldface, italics and underlining (only for 128)
- Non-destructive format commands embedded in text
- Reads files generated by Pocket Filer 2 and Pocket Planner 2

Serious software that's simple to use.

**Pocket Filer™ 2**

Professional Database for the Commodore 128 and 64

- Pocket 2 Software has 128 on one side and 64 on the other
- Up to 2000 characters in up to 255 fields per record, number of records limited only by disk space
- Sorts by up to 9 criteria on more than 2 different sorts
- Files compatible with Pocket Writer 2 and Pocket Planner 2
- Optional protection with passwords, including limited access to printing
- User-definable reports and labels

Serious software that's simple to use.

**Digital Superpak™ 2**

Professional Word Processor, Spreadsheet and Database for the Commodore 128 and 64

Pocket Writer™ 2, Pocket Planner™ 2 and Pocket Filer™ 2

Serious software that's simple to use.

**If you can't find Pocket™ 2 Software at your dealer, use this coupon or phone (416) 731-8775 to order.**

METHOD OF PAYMENT (no Purchase Orders or C.O.D.)  
 Money Order  VISA  MasterCard  Amer. Exp.  Check   
 CHARGE CARD #   
 EXP.  /

Credit card orders must be signed.  
 VISA, MasterCard and AMEX accepted. No shipping and handling charges.  
 Ontario residents add 7% sales tax. Please allow 4-6 weeks for delivery.

Order yours today.  
 www.Commodore.ca  
 Circle 401 on Reader Service card.  
 May Not Reprint Without Permission

Individual Pocket™ 2 programs are just \$59.95 U.S. each.  
 Digital Superpak™ 2 is just \$99.95 U.S.  
 Send me Pocket Writer™  Pocket Planner™   
 Pocket Filer™  Digital Superpak™  Total \$ \_\_\_\_\_  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State/Prov.: \_\_\_\_\_  
 Country: \_\_\_\_\_ Zip/Postal Code: \_\_\_\_\_



2-30 Wertheim Court  
 Richmond Hill, Ontario  
 Canada L4B 1B9  
 (416) 731-8775



# IS YOUR 128 OR GROW

So there you are, furiously working away at your Commodore 128, thinking everything is just peachy, when all of a sudden, it hits you. That haunting, hollow, horrible question that every computer owner must inevitably face:

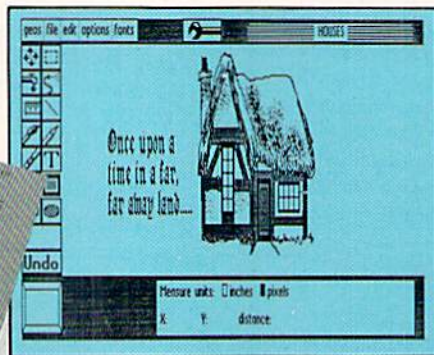
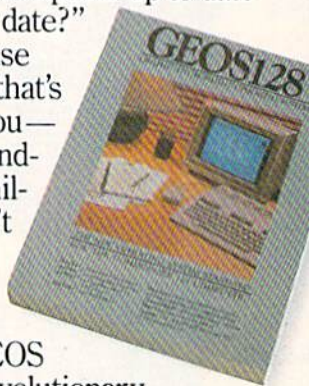
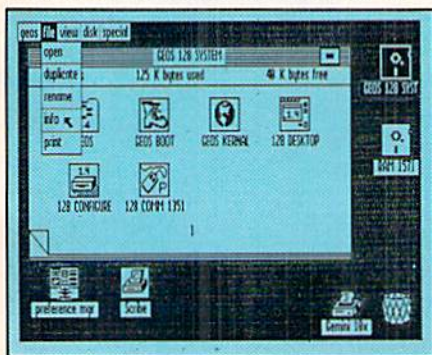
"Is my computer up to date—or out of date?"

If you use GEOS 128, that's a question you—or your grandchildren's children—won't ever have to worry about.

Because GEOS 128 is the revolutionary software system designed to push your hardware to new limits. Unleash its full power across a full 80 column screen. And expand its capabilities for years to come.

## We should have installed disk brakes.

Loading up with GEOS turns your 128 into a mouse-driven maniac that loads, processes and saves everything up



to seven times faster than normal. Part of that's due to the GEOS diskTurbo, but most of it's due to the fact that GEOS 128 doesn't treat your 128 like a C64.

You see, by recognizing your machine as a 128, GEOS 128 operates at a full 2 MHz, instead of 1 MHz. So you get twice the speed. Twice the power. And since GEOS 128 also supports the quicker 1571 and 1581 double-sided disk drives—and the 1750 RAM expansion unit—there's no telling how much faster that puppy will fly.

## Fast and slick with mouse or stick.

Using GEOS is ridiculously simple. All you need is a mouse or joystick, and a keen ability to point and click. Everything else is pretty much a matter of reading *menus* (a technical term for "little lists of things"), or selecting *icons* (a technical term for "little pictures of things"). It's

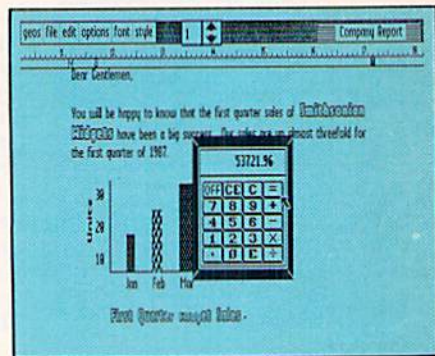
sort of like talking in sign language.

For example, if you want a document for word-processing, you point to the icon that looks like a stack of papers. Click your mouse and bingo—you're in the file. If you want to erase the file, you drag the stack of papers over to the little waste basket and click your mouse.

Poof. That's about as tough as it gets.

## Working within the system.

Learning where things are in GEOS is pretty simple, especially if you've ever sat behind a desk. Because that's exactly how we designed



GEOS 128.

You keep your documents and graphics in files; everything else stays right on the desktop: the notepad, the calculator—there's even an alarm clock. In fact, the only thing our desktop



# GROWING UP GROWING OLD?

Now, we realize that's a lot to pack into one GEOS package. But as long as we're packing it in, we might as well let you know something else: There's more.

doesn't have a place to put your feet when the boss isn't around.

But not only does GEOS give you a place to write and draw, it actually helps you write and draw better.

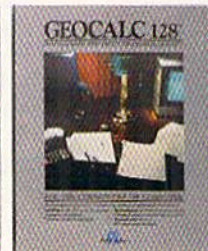
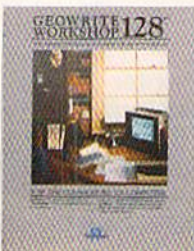
Because unlike your basic office model, our desktop comes with geoWrite and geoPaint built right in.

With geoWrite, your way with words leaves people speechless, as they watch you effortlessly cut, paste and move entire blocks of copy anywhere on the page. And since geoWrite comes with different fonts in a variety of styles and sizes, your documents become even more dazzling.

With geoPaint, you can draw designs. Create with colors. And tantalize your tastes with tons of tones and textures. Invert, rotate or mirror images.

Then place them wherever you want: either in your geoWrite document, or in your GEOS Photo Album for later use.

But no matter what kind of masterpiece you create, you



always get to view it on a beautiful, 80 column-wide screen. No more scrolling left to right. With GEOS 128, what you see really is what you get.

## The more you put into your system, the more you get out of it.

Of course, when we say that GEOS 128 has far-reaching implications, we're not kidding around. Every GEOS 128 package includes free QuantumLink software, which hooks you (via modem) into a nationwide network of Commodore people just like you. There's even a service that will Laserprint your documents for you.

## The older it gets the better it looks.

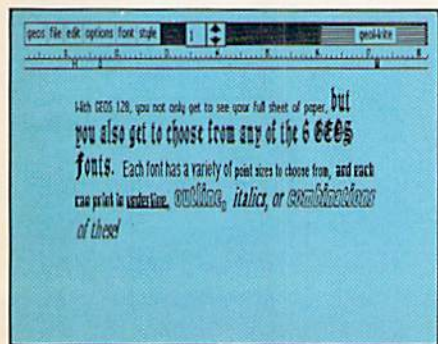
It's true. Because there are always new GEOS applications just waiting to jump off the shelves and into your 128. Packages like geoDex and geoFile, for keeping addresses and data straight. Fontpack and Writer's Workshop, for tweaking text with that special, extra touch. And,

of course, geoCalc, a full-featured graphics spreadsheet for all you number freaks.

They're just the first in a long line of GEOS applications that are constantly being developed to keep your 128 up to date.

So if you'd rather have your 128 grow up than grow old, load up with GEOS. You owe it to yourself. You owe it to your 128.

Heck, you owe it to your grandchildren.



 **Berkeley  
Softworks**

The brightest minds are working at Berkeley.

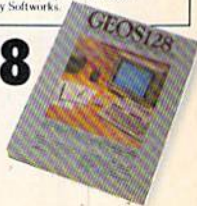
To order call 1-800-443-0100 ext. 234

**GEOS 128 \$69.95**

(California residents add 7% sales tax.)  
\$2.50 US/\$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

Commodore, Commodore 128 and C64 are trademarks of Commodore Electronics, Ltd. GEOS, GEOS 128 and Berkeley Softworks are trademarks of Berkeley Softworks.

**GEOS 128**



www.Commodore.ca  
May Not Reprint Without Permission

Circle 427 on Reader Service card.



**INTRODUCING...**

**Supra Corporation**

Supra Corporation, a leading manufacturer of computer peripherals for Atari and other personal computers has obtained the exclusive license to manufacture the Cardco line of products.

Cardco has been hailed by many computer magazines as the standard by which competitors should be measured. At Supra Corporation, we plan to maintain this leadership position in the Commodore accessory market by providing complete product documentation, unequaled customer service, and a product line second-to-none.

We will continue to carry on research and development to create innovative state-of-the-art software and accessories for Commodore computers. These products will help you enjoy your computer more and increase it's value.

**OTHER COMMODORE PRODUCTS**

- 1064 Modem 49.95
- Cardco B Interface 39.95
- Cardco PS Interface 69.95
- Cardco +G Interface 49.95
- CB-2 Expander 24.95
- Freeze Frame 49.95
- S' More 49.95
- CardKey Numeric Keypad 29.95
- Write Now! 29.95
- Spell Now! 29.95
- Calc Now! 29.95
- File Now! 29.95
- MicroStuffer 69.95
- 64K Printer Buffer

**"World's Largest Manufacturer of Commodore Accessories"**



Fast, Powerful and Totally Compatible!

A centronics parallel interface with full keyboard graphics. The G-WIZ works with most common printers and can do screen dumps in 2½ minutes with its built-in-buffer. Plugs directly on to printer. \$39.95

**SUPER G**

High Speed Parallel Printer Interface with Graphics Buffer and Full Commodore Graphics Emulation - Built-in buffer for super fast graphics printing. Full Commodore character set, including all graphics, reversed text and reversed graphics characters. \$69.96



**FREEZE FRAME**

**Totally Transparent Screen Dump**  
This cartridge dumps screen memory graphics to a printer with only two key strokes. Works with any program in any language. \$49.95

**S'MORE**

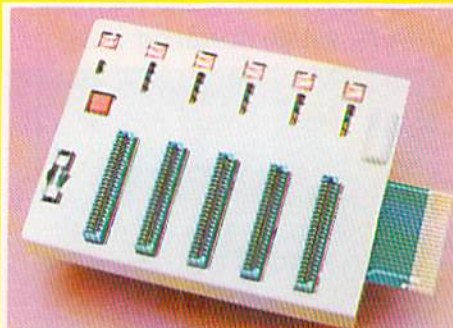
Adds over 60 new and enhanced BASIC commands and 57% more free RAM memory for programming. \$29.95



**Expansion Interface**

Also for C-128

An enclosed five slot, fully switch selectable expansion interface for the Commodore 64. Allows the user to select any cartridge slot or combination of cartridge slots. Convenient reset button. \$39.95



Available at your local dealer, or call:



**Supra Corporation**

1133 Commercial Way / Albany, OR 97321  
(503) 967-9075-Orders  
(503) 967-9081-Technical Support  
Telex: 5106005236 (Supra Corp.)



A Cardco Product



# RUN

PUBLISHER  
STEPHEN TWOMBLY

EDITOR-IN-CHIEF  
DENNIS BRISSON  
MANAGING EDITOR/PRODUCTION  
SWAIN PRATT

REVIEW EDITOR  
BETH JALA  
COPY EDITOR  
PEG LE PAGE

NEW PRODUCTS EDITOR  
HAROLD R. BJORNSEN  
TECHNICAL MANAGER  
LOU WALLACE

TECHNICAL EDITOR  
TIMOTHY WALSH

ASSOCIATE EDITORS  
JIM BORDEN; MARGARET MORABITO;  
JIM STRASMA

ART DIRECTOR  
ROSSLYN A. FRICK

ASSISTANT ART DIRECTOR  
HOWARD G. HAPP

DESIGNERS  
ANNE DILLON  
ROGER GOODE

PRODUCTION ASSISTANT  
RUTH BENEDICT

ASSOCIATE PUBLISHER/SALES MANAGER  
STEPHEN ROBBINS

SALES REPRESENTATIVES  
KENNETH BLAKEMAN  
NANCY POTTER-THOMPSON

CLASS ADS  
HEATHER PAQUETTE-EAST COAST  
603-924-9471

ADVERTISING COORDINATOR  
SUE DONOHUE

SECRETARY  
SANDY KIERSTEAD

WEST COAST SALES MANAGER  
GIORGIO SALUTI

CLASS ADS/SALES ASSISTANT  
DANNA CARNEY  
3350 W. BAYSHORE ROAD, SUITE 201  
PALO ALTO, CA 94303  
415-328-3470

MARKETING MANAGER  
WENDIE HAINES

MARKETING ASSISTANT  
LAURA LIVINGSTON

BUSINESS MANAGER  
BARBARA HARRIS

## F E A T U R E S

<b>RUNNING RUMINATIONS</b> .....	6
Welcome to <i>RUN</i> 's Fourth Annual Special Issue.	
<b>HOLIDAY GIFT GUIDE</b> .....	9
Before you go shopping, browse through these pages of useful and imaginative presents for the computerists on your list.	
<b>CAVEAT EMPTOR</b> by Annette Hinshaw .....	19
Make sure your gifts will be well received by following a few basic shopping guidelines.	
<b>COMMODORE CLINIC</b> by Jim and Ellen Strasma .....	26
Highlights of 1987 from Commodore Clinic, our column that answers readers' questions on hardware, software, programming and other computing problems.	
<b>MAGIC</b> by Jim Borden .....	36
Two hundred of the best 1987 hints and tips from Magic, the original column on performing Commodore computing wizardry.	
<b>EASY APPLICATIONS</b> .....	48
Two of 1987's short, but useful applications for your Commodore computer.	
<b>RUN's 1988 CALENDAR</b> .....	48A
Our pull-out wall calendar features important dates in microcomputing history and three delightful seasonal programs you can type in and run. (Note: For two of these programs, you first need the Sprite Maker program. See page 57.)	
<b>MEGA-MAGIC</b> .....	53
Five selections from past Mega-Magic columns, featuring tips and techniques that are bigger than Magic.	
<b>C-64 SPRITE ML COMMANDS</b> by Louis Wallace .....	57
You first need to load and run this program in order to run the Summer and Fall programs included on our 1988 Calendar.	
<b>COMMODORE SERVICE CENTERS</b> .....	97
When a bug crawls into your Commodore equipment, refer to this up-to-date, state-by-state list of official Commodore-authorized service centers.	
<b>HOW TO TYPE RUN LISTINGS</b> .....	110
Using <i>RUN</i> 's Perfect Typist checksum programs.	
<b>LIST OF ADVERTISERS</b> .....	112



*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 Elm St., Peterborough, NH 03458. Phone 603-924-9471. Second-class postage is paid at Peterborough, NH, and at additional mailing offices. Canadian second-class mail registration number is 9565. Subscription rates in U.S. are \$19.97 for one year, \$29.97 for two years and \$41.97 for three years. In Canada, a one-year subscription is \$39.97 in Canadian funds or \$24.97 in U.S. funds drawn on a U.S. bank. In Mexico, the one-year subscription rate is \$24.97, with U.S. funds drawn on a U.S. bank. Foreign subscriptions are \$59.97 for one year, with U.S. funds drawn on a U.S. bank. Please inquire about foreign air mail subscription rates. *RUN* is nationally distributed by International Circulation Distributors. 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.)

Entire contents copyright 1987 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. All rights reserved. *RUN* makes every effort to assure the accuracy of articles, listings and diagrams published in the magazine. *RUN* assumes no responsibility for errors or omissions in editorial or advertising content.



# RUNNING RUMINATIONS

Whether you're a beginner or an expert, a C-64 or C-128 user, this Fourth Annual Special Issue holds a lot in store for you.

## SPECIAL ISSUE: 1988

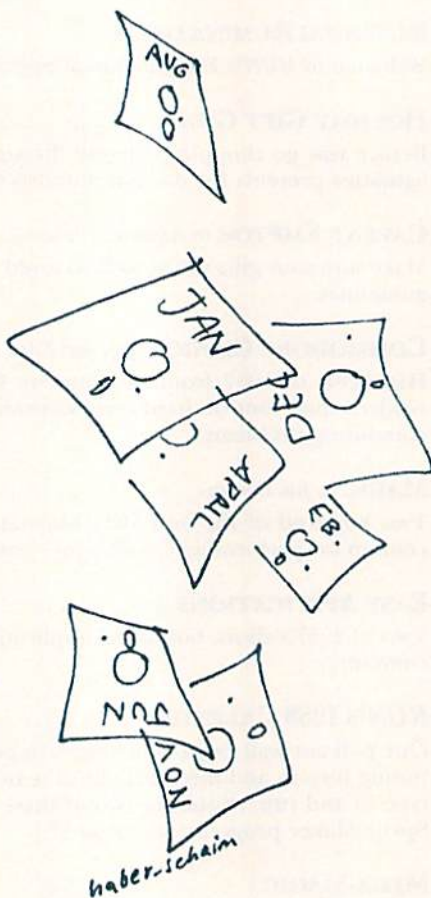
Without any hesitation at all, I can tell you that *RUN*'s Fourth Annual Special Issue is our best ever. But, as the saying goes, the proof of the pudding is in the eating. So, let's sample a taste of what this issue contains:

—**Holiday Shopper's Guide.** For those who are looking for a computing gift for themselves or a friend or relative, this buyer's guide—just in time for the holiday shopping season—offers many ideas. Everything from printers to programs to paperbacks—all organized by product category and including the complete addresses of the manufacturers.

While making no claims to be an all-inclusive gift guide, this section contains scores of products—along with a description of each one—for your Commodore. Inclusion of a product in this buyer's guide does not represent an endorsement of that product; rather, it's a list of what's available and noteworthy. To help you choose what's best for you, we have also included tips on how to buy products in the Commodore marketplace and guidelines on how much to spend for the kind of product you're looking for.

—**The Best of Commodore Clinic.** Got a computing problem that you can't seem to resolve? Chances are that the solution is here in this collection of Commodore Clinic answers to questions most troubling *RUN* readers. Computer whiz Jim Strasma offers his expert advice concerning software availability, compatibility, hardware modifications, applications, programming, new products and more.

—**Magic Tricks.** No *RUN* Special Issue would be complete without a collection of Magic, *RUN*'s popular column of useful tricks and tips. One of the reasons for its popularity is the immediacy of these short routines, programming techniques, keyboard entry shortcuts and general computing hints. No long program listings to type in, no lengthy documentation or instructions to read. You'll discover information on how to do things that you thought weren't possible. You'll witness the re-



sults right before your eyes. Now, that's magic.

Compiled by noted Commodore programmer, Jim Borden, the tricks are organized by subject matter. They are written by Commodore users—just like you—who want to share their practical, down-to-earth knowledge. So you can bet the tricks are useful and will help you extend the enjoyment of your Commodore computer, as well as advance your computing skills.

You'll be impressed by the skill and cleverness of the tricks, which were selected from the 1987 issues of *RUN*. With over 200 tricks in this issue, I'll wager that there'll be dozens you can use immediately and dozens more that you'll want to come back to at a later date.

—**Computing Calendar.** Over the years, the *RUN* pull-out programmer's

wall chart has become a Special Issue trademark. This year we're bringing our readers something new—a pull-out computer calendar that features important dates in the annals of personal computing and significant milestones in the history of Commodore computing. The front and back covers of the calendar feature colorful artwork generated on a C-64 by noted Commodore artist Wayne Schmidt. In addition, the calendar features entertaining "seasonal" program listings that will help you get into the spirit of the season—Spring Scene, Summer Celebration and Fall Holidays, the last two requiring the useful Sprite Controller program included in the Special Issue.

—**Utilities & Applications.** This issue also contains a number of easy-to-type-in utility and application programs that you'll want to save and add to your software library.

—**Guide to Service Centers.** Where can you turn for help when you have a problem with your computer equipment? It's reassuring to know that you're not alone—there's someone close by who can help. This official Commodore service center listing, organized alphabetically by city within each state, will tell you where to take your ailing computer for repair.

As you can see, this year's issue will be many things to many different people, and we feel we're more than justified in calling this issue "special." This annual issue is the result of a lot of hard work by a lot of talented people. In previous years, the Special Issue has been a prized addition to the collection of Commodore computerists. And this year is no exception.

We have retained the best features of previous years and combined them with some new features that make this issue the best yet. See if you don't agree.

Dennis Brisson  
Editor-in-Chief



Over 500,000 Sold to Homes, Schools & Offices

# PACKED with PROGRAMS

**EIGHT PROGRAMS AND MORE ON EVERY DISK.** What's the opposite of "downtime"? It's UPTIME, of course. Just imagine ... a disk each and every month, delivered right to your door and packed with programs for your Commodore.

**We make it easy and inexpensive.** You deserve value. At UPTIME we believe in value. That's why each month 30,000 people like you enjoy a disk full of programs and information.

**Make your life easier! Get more from your computer.** Organize your life and be more productive with **home management** programs. Expand your knowledge with **educational** programs. Relax and enjoy monthly **games** or **adventures**. Make using your Commodore a snap with helpful **tutorials** and handy **utilities**. It's terrific!

**DISCOVER UPTIME.** You deserve the best from your Commodore. Have the best and save the most with UPTIME.

**Subscribe now and save.** You won't believe the low price! Satisfaction guaranteed or your money back. Make the very next disk yours. Fill in the coupon and return it to us, or simply call. We'll start your subscription immediately. For **immediate service**, call toll-free:

**1-800-437-0033**  
anytime, day or night.



QUALITY PROGRAMS  
LESS THAN  
60¢ EACH

**NEW**

FOR ALL  
COMMODORE  
C64 AND 128  
COMPUTERS

FROM **Volume 1, No. 1**

- Flip 'Em ■ Brain Teasers ■ Shopping Lister
- Video Phile ■ Calendar Creator ■ File Appender ■ Nom de Plume

I'LL BYTE!!! I'm a Commodore enthusiast who wants more. Please start my subscription to UPTIME immediately.  
**SAVE 60%** **12** Disk Issues \$69.95

Name \_\_\_\_\_ (Add \$2 per issue in foreign countries, except Canada and APO)  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Type of Computer \_\_\_\_\_  
 Payment enclosed. (Make checks payable to UPTIME.)  
Bill my:  Visa  MC  Exp. Date \_\_\_\_\_  
Signature \_\_\_\_\_  
Account No. \_\_\_\_\_

**3** Disk Issues \$29.95

**1** Disk Issue \$11.95

Send to:  
UPTIME · PO Box 299  
Newport, RI 02840  
(401) 849-4925



# WIN YOUR STATE LOTTO WITH YOUR COMPUTER!

"The home computer is the most powerful tool ever held by man" (or woman for that matter)!

Are you still wasting money with random guesswork?

This amazing program will analyze the past winning lotto numbers and produce a powerful probability study on easy to read charts in just seconds. With single key presses from a menu you'll see trends, patterns, odd/even, sum totals, number frequency and more on either your screen or printer. Includes automatic number wheeling, instant updating and a built-in tutorial to get you started fast and easy!

**CHECKS & CHARGE CARDS ACCEPTED WITH NO SURCHARGE.**

All orders shipped same day (except personal checks).

APPLE & IBM Compatibles ..... \$24.95  
Macintosh (requires M/S Basic) ..... \$29.95  
Commodore, Atari & Radio Shack ..... \$21.95

Back-Up Copies - \$3.00

Please add \$2.00 for shipping and handling.  
Phone credit given with orders.

(513) 233-2200

**SOFT-BYTE**



P.O. Box 5701, Forest Park  
Dayton, Ohio 45405

Run

Circle 429 on Reader Service card.

# CAD-3D

NEW ADVANCED  
3-D GRAPHICS



For Commodore 64/128 in 64 mode  
View Designs in Multiple Perspectives

- ↳ Versatile/Fast 360 degree rotation
- ↳ 2000 Line Display
- ↳ Printer capability with latest compatibles
- ↳ 1520 Plotter availability
- ↳ Disk Loading and Saving of Designs
- ↳ Superimpose Designs/ Modify Partial Designs
- ↳ Commercial Graphic program compatibility

Professional—Educational—Home Applications  
Architects, Engineers, Designers, Programmers, Students  
CAD-3D! Enter me into the fastest growing field in graphic technology.  
At a special introductory price \$49.95. Add \$4.00 for shipping and handling, for C.O.D. add an additional \$4.00. (California residents please include 6% sales tax).

**ih Software**

2269 CHESTNUT STREET  
SUITE 162  
SAN FRANCISCO, CA 94123

ORDER LINE • (415) 923-1081  
Dealers/Distributors inquiries welcomed.

Circle 430 on Reader Service card.

# RUN

PRESIDENT  
MICHAEL PERLIS

VICE-PRESIDENT/GENERAL MANAGER  
ROGER MURPHY

DIRECTOR OF CIRCULATION  
FRANK S. SMITH

CIRCULATION MANAGER  
BONNIE WELSH

DIRECT MARKETING MANAGER  
PAUL RUESS

SINGLE COPY SALES MANAGER  
LINDA RUTH

TELEMARKETING MANAGER  
ELIZABETH R. KEHN

AUDITS AND STATISTICS MANAGER  
CECILE GIGUERRE

DIRECTOR, SPECIAL PRODUCTS  
PAUL FINCH

DIRECTOR OF CREDIT SALES & COLLECTIONS  
WILLIAM M. BOYER

DIRECTOR OF CORPORATE PRODUCTION  
DENNIS CHRISTENSEN

MANUFACTURING MANAGER  
SUSAN GROSS

TYPESETTING MANAGER  
LINDA P. CANALE

SYSTEM SUPERVISOR  
DOREEN MEANS

**Manuscripts:** *RUN* invites its readers to send contributions in the form of manuscripts with drawings and/or photographs to be considered for possible publication. The procedure for submitting an article is outlined in the *RUN* writer's guidelines, which you can obtain by sending a self-addressed, stamped envelope. All contributions, queries, requests for writer's guidelines and any other editorial correspondence should be directed to *RUN*, Editorial Offices, 80 Elm St., Peterborough, NH 03458; telephone: 603-924-9471.

**Advertising inquiries:** Send your correspondence to Advertising Offices, CW Communications/Peterborough, Inc., 80 Elm Street, Peterborough, NH 03458; telephone: 800-441-4403.

**Subscription problems or address changes:** Call 1-800-227-5782 (NY and Canadian residents, 1-800-732-9119) between 9 a.m. and 5 p.m. EST, Monday-Friday, or write to *RUN*, Subscription Department, PO Box 954, Farmingdale, NY 11737.

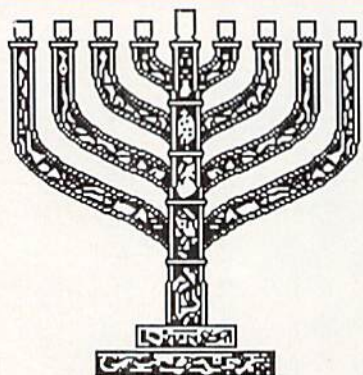
**Problems with advertisers:** Send a description of the problem and your current address to: *RUN*, 80 Elm Street, Peterborough, NH 03458, ATTN.: Barbara Harris, Customer Service, or call 1-800-441-4403.

**Microfilm:** *RUN* is available in Microform from University Microfilms International, 300 N. Zeeb Road, Dept. P.R., Ann Arbor, MI 48106.

**Back Issues:** *RUN* back issues are available for \$3.50, plus \$1 postage and handling from: *RUN*, Back Issue Orders, 80 Elm St., Peterborough, NH 03458. 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.

**Problems with ReRUN:** Address correspondence to ReRUN, 80 Elm St., Peterborough, NH 03458.

**RUN's BBS:** The Running Board is *RUN*'s reader feedback bulletin board, which you can call anytime, day or night, seven days a week for up-to-date information about the magazine, the Commodore industry and news and information of interest to all Commodore users. Call: 603-924-9704. The Running Board uses a standard protocol, 300 baud, one stop bit, no parity, full duplex and a word length of eight bits.



## Hanukkah Gift Software!

from  
Davka Corporation

• **DavkaGraphics**— Best-selling graphics disk with over 60 beautiful Judaic images for use with The Print Shop™. Ideal for Hanukkah cards, special occasions, and

personal use. A wide range of pictures including Israeli symbols, Jewish holidays, and much, much more! For Commodore 64/128. Only \$24.95. Requires The Print Shop™.

• **Game of The Maccabees**—Thrilling arcade-style game relives the story of Hanukkah and the stirring battles fought by the heroic Maccabees. Game of the Maccabees teaches as well as entertains—if you know your Hanukkah facts, you can receive a higher game score! For Commodore 64/128. Only \$24.95

To order call Toll-Free 1-800-621-8227

Major credit cards accepted. Please add \$2 shipping for all orders

Davka Corporation • 845 N. Michigan  
Chicago, IL • 60611

Call or write for our catalog of Judaic/Hebrew software for Commodore.

Circle 426 on Reader Service card.



# Holiday Gift Guide

*Let RUN put the happy back in your holiday.*

*The following pages give you a survey of the many products you can choose  
as gifts to please your special computerist.*



ARCADE GAMES  
BOOKS  
DATABASES  
DISK DRIVE SPEED-UPS  
DRAWING PROGRAMS  
EDUCATION  
FINANCIAL  
FLIGHT SIMULATORS  
GRAPHICS  
GRAPHIC ADVENTURES  
HOME MANAGEMENT  
INPUT DEVICES  
INTEGRATED SOFTWARE  
LOW-COST SOFTWARE  
MUSIC

NAVAL SIMULATIONS  
NETWORKS  
OTHER HARDWARE  
PARTY GAMES  
PRINTERS  
PRODUCTIVITY  
SOFTWARE FROM MOVIES  
SPORTS  
SPREADSHEETS  
TELECOMMUNICATIONS  
UNUSUAL APPLICATIONS  
UTILITIES  
WORD PROCESSORS  
MANUFACTURERS' ADDRESSES





## ARCADE GAMES



### Control the Action

*Accolade's Comics* is an interactive comic book, whose direction you control yourself. The comic lets you choose between two themes and dozens of story lines that you can play in any of eight arcade games. Accolade; C-64; \$39.95.

### What a Prize!

*Defender of the Crown* is a tale of brave knights whose days are filled with daring jousts, sword fights and enemy castles in seige. To save England, your skills as swordsman and military leader will be tested. Should you succeed, you'll win the Crown of England and the love of many a beautiful damsel. Mindscape; C-64; \$34.95.

### Weird Game

In *Bop 'n Rumble*, your mission is to save all the grannies from the vicious elements that have gone wild in the city. Mindscape; C-64; \$29.95.

### AI-eeeeeeee!

You're *The Last Ninja* and the last hope to recapture the sacred scrolls that contain the secret of Ninja power. Activision; C-64; \$34.95.



### What's GOING on?

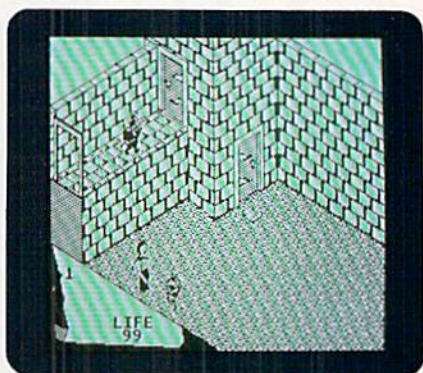
In Lucasfilm's *Maniac Mansion*, you think your goal is to rescue a friend who was kidnapped by a weird family (think of them as your neighbors; it adds to the fun) and held captive in their mansion, but as you direct a trio of teenagers to him, you discover deeper and stranger plots. Activision; C-64; \$34.95.

### Save Earth from the Demoids

*Power*, a 22nd-century galactic war game, pits you against the hostile Demoid Empire that occupies Earth's vital source of power, the Miltonium conversion plant. You must successfully complete seven levels of play before you can infiltrate the plant and disable the converter before the Demoids destroy it. Accolade; C-64; \$14.95.

### Burp

When things get dull around the house, take a trip to the stars in *Star Trek: The Promethean Prophecy*. You'll occupy yourself with contacting an alien culture and searching their planet for a food supply for your starving crew. It's a good game to play a few hours before supper time. Simon & Schuster Software; C-64; \$32.95.



### Save Dan Dare's Friends

You and your friends compete against a 25-minute game clock to guide *Dan Dare: Pilot of the Future* through four areas to rescue his friends Digby and Professor Peabody, who are imprisoned on a deadly atomic asteroid hurtling toward Earth. Electronic Arts; C-64; \$19.95.

### Computer Board Game

The object of *Robot Rascals* is for you and up to three of your friends to maneuver your robots around the planet Laustenfownd in search of the objects matching those on the cards you hold in your hands. The winner is the first to find all the objects and return home. Electronic Arts; C-64; \$39.95.

### For the Kids

A series dedicated to the 10-14 year old gamer, Maxx-Out has titles like *Spy vs Spy III: Arctic Antics*, *Boulder Dash Construction Set* and *Rad Warrior*. Epyx; C-64; \$24.95.

### Someone Get the Lights

In *Fairlight*, you are Isvar the Unknown, who must penetrate the secrets of the dungeons of Fairlight to free the sorcerer trapped within and recover the lost Book of Light. Mindscape; C-64; \$29.95.

## BOOKS

### Play 35 Games

Written in Basic 7.0, the program listings in *35 Amazing Games for Your C-128* offer everything from arcade action to educational fun. HP Books; C-128; \$9.95.

### Look It Up

The 656-page *Commodore 128 Reference Guide for Programmers* is for beginners and advanced pro-

grammers both, covering Basic, assembly language, 40- and 80-column text programming, the operating system, CP/M, DOS, sprite animation, input devices and memory maps. Howard W. Sams & Co.; soft-cover; \$19.95.

### Tricks and Tips

Save time and add to your computing skills with *The Big Tip Book for the C-64/64C/128*. Its 192

pages of helpful hints and useful shortcuts is for everyone, from beginners to advanced programmers. Bantam Books; \$16.95.

### Fix It Yourself

Someone had the good idea to publish *The Brady Guide to Microcomputer Troubleshooting & Maintenance*, a step-by-step problem-solver and maintenance manual available in trade-paperback format.





## DATABASES

This guide could save you weeks—possibly months—waiting for your computer or peripherals to get back from the repair shop by showing you how to perform routine maintenance and money-saving repairs yourself. Prentice Hall Press; any computer; \$17.95.

### Music, Music, Music

There are enough music software packages in *Coda*, the 1987 edition, to start your own Abbey Road studio. The 160-page software music catalog includes such categories as Fun & Entertainment, Learning & Teaching, Sequencing & Recording, Music Printing, Voice Librarians, Sound Libraries and Programming Aids. Wenger Corp.; C-64 and C-128; \$4.

### Learn to Type

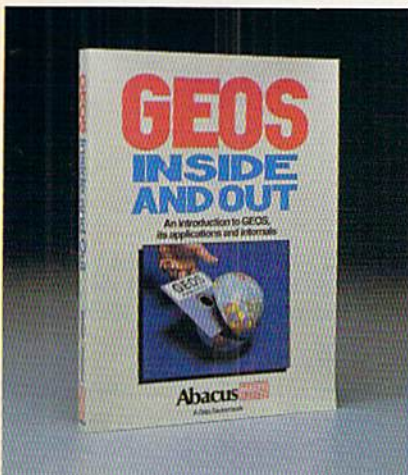
*Kids Can Type, Tool* contains 22 typing lessons for the 8-12-year-old in your family to help them zip through their homework assignments and type in all those program listings in *RUN*. The book has stiff covers so it can stand erect on a desk for easy viewing. Barron's; any computer; \$6.95.

### By the Guru Himself

*Machine Language for the C-64, 128 and Other Commodore Computers*, a 377-page tutorial by the Commodore guru, Jim Butterfield, helps you gain speed, versatility and an understanding of computers in general. Prentice Hall Press; \$14.95.

### GEOS Fantasia

*GEOS Inside and Out*, for beginners and seasoned computer users, not only shows you how to use GEOS, but also how to add your own applications. And it contains the listing for the FileMaster program so that you can convert your programs to GEOS format and create icons for them. Abacus; \$19.95.



### Fleet Systems Database

The *Fleet Filer* database is compatible with the Fleet Systems 2 and 3 word processors. The package has both an 80-column C-128 database and a C-64 database, which have identical menus, so that you can use files created by the C-64 version in the C-128 version and vice versa. Professional Software, Inc.; C-64 and C-128; \$39.95.

### Vizastar 128

*Vizastar 128* is an 80-column spreadsheet/database combination, with the database an accessory to the spreadsheet, so that the two should really be used in conjunction. It's menu-driven and very fast. Progressive Peripherals & Software; C-128; \$89.95.

### Timeworks' Timesaver

*Data Manager 128* is a screen-formatted, 80-column database that uses drop-down menus for quick and easy access to options and modes. Timeworks; C-128; \$69.95.

### Super Database

*Superbase 128*, with well-written documentation, lets you access full-page help screens that display anything you might need to know about performing a particular procedure. It operates in a flex-

ible full-screen format, and once you've designed a layout, all functions are accessed from two main menus. Progressive Peripherals & Software; C-64 and C-128; \$99.95.

### Consult The Consultant

*The Consultant* has a large, 186-page guide that leads you slowly through the learning process and provides an easy explanation of the three-step procedure for writing records to disk as sequential files, so they can be read into your favorite word processor. It performs the four basic math functions and handles field tabulations at the end of numeric fields, with up to 36 tabulations per report. Electronic Arts; C-64 and C-128; \$59.95.

### Need More Room?

With *Pocket Filer 2*, you can activate the numeric keypad and other C-128 keys in C-64 mode and use it with the 1351 proportional mouse and with the Commodore 1700 and 1750 RAM expanders as RAM disks, providing over 500 and 2000 blocks of storage, respectively. You can enter up to 255 fields per record, containing a maximum of 2000 characters and sort up to nine fields. Digital Solutions, Inc.; C-64 and C-128; \$59.95.

## DISK DRIVE SPEED-UPS

### For the Fast Times

*Fast Load* loads any software up to five times faster than normal, loads disks with two keystrokes, copies single files, sends commands to the disk drive and lists directories. Includes a full assembly language monitor. Epyx; C-64 and C-128; \$39.95.

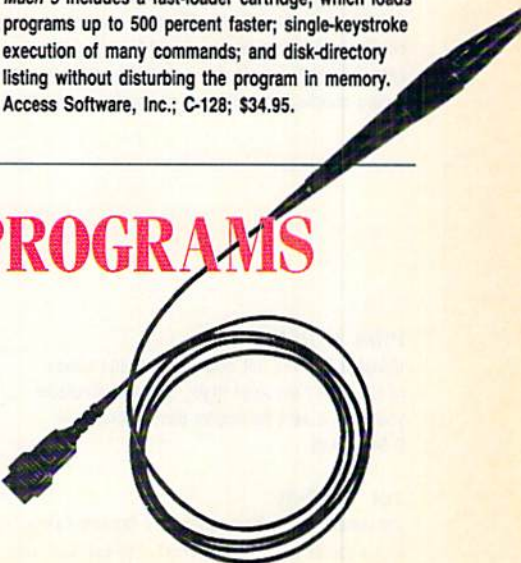
### Beyond the Load-Speed Barrier

*Mach 5* includes a fast-loader cartridge, which loads programs up to 500 percent faster; single-keystroke execution of many commands; and disk-directory listing without disturbing the program in memory. Access Software, Inc.; C-128; \$34.95.

## DRAWING PROGRAMS

### Draw Free-Hand

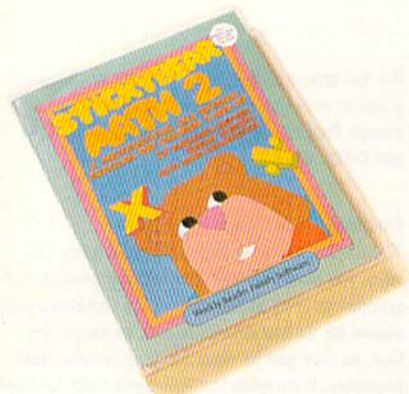
Using Inkwell's new light pen (purchase separately), a mouse, joystick or KoalaPad, you can use *Flexi-draw* (latest version 5.5) to create graphics free-hand or draft diagrams, plans, graphs; then link picture screens to form larger drawings. The package also lets you add text to your drawings. Inkwell Systems; C-64; \$34.95. ▶







## EDUCATION



### Drill and Practice

*Stickybear Math 2*, the sequel to *Stickybear Math 1*, offers drill and practice in multiplication and division and is recommended for ages seven and up. The program automatically adjusts its difficulty level based on the success the child has had with previous problems. Weekly Reader Family Software; C-64; \$29.95.

### Take a Trip

*Where in the USA is Carmen Sandiego?* is a mystery-exploring game wherein you must follow Carmen's group around the U.S. Contains a map of the United States and Fodor's travelguide. Broderbund; C-64; \$39.95.

### Don't Embarrass Yourself

With *RSVP* you explore a wide variety of common and uncommon social situations at home and abroad. You test and expand your knowledge of manners either through gameplay and simulation or through simple question-and-answer sessions on a choice of topics. Blue Lion Software; C-64; \$29.95.

### Who Besides Professors Read Term Papers?

*Term Paper Writer* turns your collection of facts into an organized document, with notetaking, outlining, writing and search functions to help you. Activision; C-128; \$49.95.



### Where's the Best School?

*The Perfect College*, with a database on over 1650 accredited four-year U.S. colleges and universities, lets you choose up to 26 college-selection criteria, including cost, location, majors, student/faculty ratio and overall competitiveness. Mindscape; C-64; \$19.95.

## FINANCIAL

### Balance Your Books

*Dome Accounting by Computer*, closely modeled after the popular *Dome Simplified Bookkeeping System*, features easy-to-set-up procedures, automatic updating, desk accessories and reports. Great American Software; C-64; \$39.95.

### Keep Track of Your Finances

J.K. Lasser's *Your Money Manager*, a home accounting and small-business tool to organize and keep financial records, has transaction windows to record checks, deposits and payments. A calculator

and graphs are also available. Simon & Schuster Software; C-64; \$69.95.

### Back to the Futures

Become a daring speculator in the markets of your choice in the money game, *The Financial Time Machine*. You can lose your shirt alone or play it with up to three of your friends (misery loves company), choosing any five-year period between 1930 and 1984, betting from \$25,000 to \$100,000. You play it like the real thing: The game even starts off with the running of a ticker tape and news events

that can influence prices. Good luck. Insight; C-64; \$34.95.

### Your Financial Future

Sylvia Porter's *Your Personal Financial Planner* for the C-128 leads you step by step through a series of questions to help you develop comprehensive financial plans to determine the best financial moves for your career, marital status, children, savings, life insurance, investments, life-style and retirement, and to plan ahead. Timeworks; C-128; \$69.95.

## FLIGHT SIMULATORS

### Pilot a Helicopter

*Gunship* features not only the skill and action of low-level helicopter flight, but also simulates your career as a helicopter pilot. MicroProse; C-64; \$34.95.

### Jet Combat

*Jet* simulates the land-based F-16 fighting Falcon and a carrier-based F-18 Hornet. You can test your

skills under different combat conditions. SubLogic; C-64; \$39.95.

### Be Careful!

Pilot the powerful *Stealth Starfighter* on a mission to destroy the Dark Tower and with it the Merciless Council of Nine. But be careful. The sky is alive with warp fighters and the landscape bristles with radar towers. Robot-controlled photon tanks and la-

ser artillery surround you. *Stealth* has 3-D graphics effects, flight and battle sounds and five difficulty levels. Broderbund Software; C-64; \$29.95.

### Go to the Moon

Become an astronaut or a mission control specialist in *Apollo 18: Mission to the Moon* as you re-create any one of the moon missions of the '60s. Accolade; C-64; \$29.95.





## GRAPHICS

### Add More Graphics

*Graphics Integrator 2* converts picture formats among any of the popular graphics packages, adds pictures to your word processor and creates slide shows. Inkwel Systems; C-64; \$29.95.

### Pretty Pictures

With *Basic 8.0*, you can produce resolutions of 640 x 200 pixels in monochrome and 640 x 192 in color without additional hardware. The package adds over 50 new graphics commands to your C-128. An icon-based, desktop utility gives you access to your Basic 8.0 creations. Patech Software; C-128; \$39.95.

### Bestow Awards

*AwardWare*, an awards-generation program, designs and prints customized certificates, awards, announcements, stationery and memos, as well as checks, coupons and tickets. Hi-Tech Expressions; C-64; \$14.95.

### Comic Strip Artist

*Create with Garfield—Deluxe Edition*, for designing and printing original Garfield cartoons, offers over 200 pieces of artwork, different typefaces for captions and stories and the capability to print in color. Educational use in terms of encouraging writing and artistic skills. DLM; C-64; \$39.95.

## HOME HELPER

### Recipes from the Stars

*The Celebrity Cookbook* features gourmet recipes from such entertainers as Frank Sinatra, Bob Hope and Shirley MacLaine. You can also write your own cookbook. Merrill Ward; C-64; \$29.99.

## INPUT DEVICES

### Smart Mouse

Commodore's true proportional *1351* mouse measures the distance it's travelled, remembers the distance and direction and passes the information along to your computer without interrupting other program tasks, and you can use it with GEOS. Commodore Business Machines; any computer; \$49.95.

### Reach out and Light Up!

The newest light pen available for graphics work is the *184-C*. It features tri-lobular design and two tough-surface switches. Inkwel Systems; C-64; \$59.95.

### Light on the Subject

The Tech Sketch *LP10* light pen includes a light-pen-driven color paint program. Tech Sketch; C-64; \$49.95.

### Perfect Fit

Designed to fit in the palm of your right hand, the *500XJ* joystick fire-buttons are positioned for index-finger control. Epyx; C-64 and C-128; \$19.95.

### Off We Go

The *MicroFlyte* joystick, for Sublogic's Flight Simulator II, controls centering on both axes, with little backlash and more precise control. The large but lightweight box includes pushbuttons to increase or decrease your engine throttle and two buttons to control the movements of your flaps. Microcube Corp.; C-64; \$59.95.

### Greater GEOS Icon Control

*IconTroller*, a joystick-type unit, manipulates the GEOS operating system's icons. It mounts onto the keyboard and has a feed-through jack to connect a joystick or mouse. Suncom; C-64 and C-128; \$19.99. ▶

## GRAPHIC ADVENTURES

### Find a Leather Scroll

*Legacy of the Ancients* transports you to the world of Tarmalon, where you embark on a noble quest to retrieve the lost Wizard's Compendium, a leather scroll with evil powers. You pick your own character attributes such as intelligence, dexterity and charisma and then prove your mettle in five action games and two casino games before you go on your search. Electronic Arts; C-64; \$29.95.

### Escape from an Alien Planet

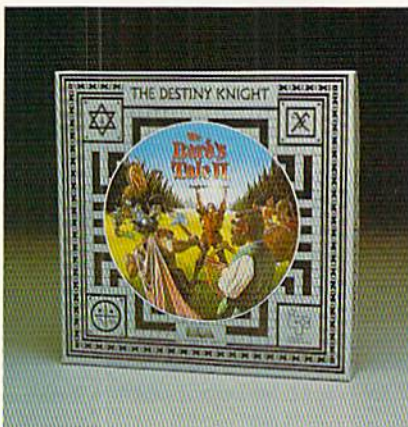
In *Mercenary*, you are an intergalactic brigand for hire, and your ship has crash-landed on the planet Targ. To get another ship and leave the planet, you'll have to ally yourself with the native Palyars against the invading Mechanoids. Datasoft; C-64; \$29.95.

### Having a Wonderful Time— Wish You Were Here

In *Trinity*, the last day of your vacation in London is also the first day of World War III. Only seconds remain until the city—and you—are vaporized by an H-bomb, unless you escape to a secret universe, a plane between fantasy and reality, where every atomic explosion is mysteriously connected. Infocom; C-64; \$34.95.

### Desert Rat

*Desert Fox*, a combat simulation and strategy game, contains five arcade-style combat scenarios such as aerial combat, tank battles and tactical maneuvers, which you encounter at random as you defend the allied supply depots from Rommel's firepower. Accolade; C-64; \$14.95.



### For D & D Fans

*The Bard's Tale II: The Destiny Knight* combines the elements of traditional Dungeons and Dragons role-playing games, a starter dungeon where players can quickly gain experience points and "Snare of Death" puzzle rooms that must be solved if your band of adventurers is to get out alive. Electronic Arts; C-64; \$39.95.

### Explore a Mythical Land

*The Pawn* takes place in the mythical land of Kerovnia. Have fun using the program's powerful parser, which lets you input complex instructions as you explore the kingdom. Firebird; C-64; \$39.95.

### How Does It Feel to be Wanted?

In *Borrowed Time*, someone wants you dead, and, as Sam Marlow, PI, you have less than a day to find out who. You control the PI's actions while the suspects move independently. Activision; C-64; \$29.95.





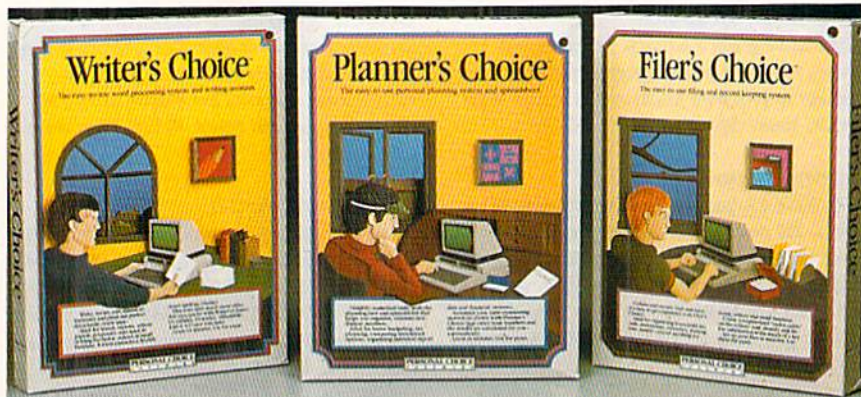
## INTEGRATED SOFTWARE

### Pick Pocket

*Pocket Writer 2, Pocket Filer 2 and Pocket Planner 2*, which make up the Pocket Series, can be used independently as well as together. You can load numeric data from the database into the cells of the spreadsheet for use in calculations and what-if projections. The word processor sorts lists of words or numbers alphabetically or numerically in ascending or descending order and displays text lines in either 25 standard or 50 half-height text lines on screen at once in 80-Column mode. Digital Solutions; C-128; \$59.95 each, \$99.95 Digital Superpak.

### Information Processor

*Vizastar 128* is an information-processing system offering a spreadsheet, programmable macros, worksheet, windows and graphics to let you create bar and pie charts. Progressive Peripherals & Software; C-128; \$89.95.



### Collect Them All

*The Personal Choice Collection* is a series of productivity tools, comprising a word processor with a 50,000-word spelling checker, a filing and record-

keeping system, and a personal planning and spreadsheet system. Activation; C-64 and C-128; \$39.95 each/\$99.95 set.

## LOW-COST SOFTWARE

### Stay Alive

In *Sanxion*, you and your friends battle alien foes in a high-speed aircraft. Skillful maneuvers are needed to keep you alive through 20 levels of 3-D landscapes and waves of attackers. Electronic Arts; C-64; \$19.95.

### Can You Survive 200 Attacks?

*Delta Patrol* involves you in an adventure through the Delta sector, where you'll race through more than 200 alien attack waves in over 50 environments. Electronic Arts; C-64; \$19.95.

### Starfighter Jet Pilot

*Sigma 7*, with seven levels of difficulty, each with three levels of play, features you as the pilot of a starfighter jet who must prevent the completion by evil aliens of Sigma 7, a powerful interstellar battle station. Accolade; C-64; \$14.95.

### Mad-Men

In *Spy vs Spy I: The Embassy Espionage Mission*, you and a friend must compete to grab the top-secret briefcase that contains four items and get away. In *Spy vs Spy II: The Island Caper*, you are in

search of buried missile parts on an exotic tropical island. Accolade; C-64; \$14.95 each.

### Take It Easy

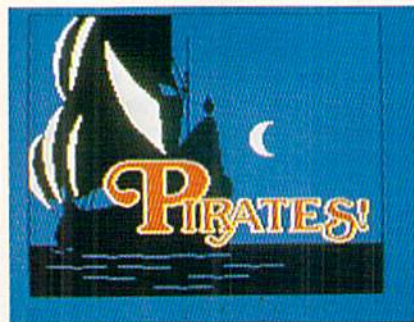
*Easy Working Software*, a series of integrated software, includes a word processor with standard editing features; a filer, which stores, selects and reports information; and a planner, which creates spreadsheets for budgeting, tax calculations, expense reports, financial statements and other applications. Spinnaker; C-64; \$9.95 each.

## MUSIC

### At Your Fingertips

With *The Music Shop*, you can compose, edit, save, print and play music, using standard musical notation, or play and rearrange dozens of pieces included in the package. Music is displayed in a page-by-page format, so no scrolling is necessary. Whole to 32nd notes, rests, eight-time signatures, triplets, ties and octave-up features and first and second endings are at your command. You can select preset instrument sounds and print sheet music. Broderbund Software; C-64; \$44.95.

## NAVAL SIMULATIONS



### Avast, Maties!

In *Pirates!*, you and your friends play buccaneers, plundering ports and ships throughout the Caribbean to build your reputations and seize fortunes. MicroProse; C-64; \$39.95.

### Down Under

As commander of a WWII fleet-class submarine that patrols the Atlantic and Pacific theatres in *Up Periscope!*, you relive 14 historical situations or hunt for enemy craft. ActionSoft; C-64; \$29.95.





## NETWORKS

### Log On

*CompuServe*, the largest information network in the country, provides you with news, sports, aviation and weather reports; newsletters from manufacturers; forums and clubs for interacting with people from around the world; electronic mail; games; and even a CB simulator for live chatting with others. *CompuServe*; \$39 to join, \$12.50/hour for 1200-baud access, \$6/hour for 300-baud access.

### Encyclopedic

*Delphi* not only has its own encyclopedia, but sophisticated online research libraries as well. You can send electronic and U.S. mail, and its *GlobalLink* service has professionals to translate your text files to a foreign language, including German, Italian and French, and then send them anywhere in the world. *General Videotex Corp.*; \$49 to join, \$17/hour daytime, \$7/hour evenings and weekends.

### I Screen of GENIE

*GENIE* has one of the largest databases of Commodore public domain software available on any network. It claims to add over 1000 new Commodore programs to its downloading databases each month. Its *Flagship Commodore RoundTable* draws many

experienced C-64 and C-128 users. Other offerings include a CB simulator for live chatting; electronic mail; a travel service; home shopping; the *Grolier's* encyclopedia; financial services; and multiplayer games. *General Electric Information Services Co.*; \$18 to join, \$5/hour non-prime-time, \$35/hour prime-time.

### Party Line

*PlayNet* is devoted to socializing and game playing. It was developed for Commodore owners, with Commodore forums for you to join. *PlayNet*; \$19.95 to join, \$12/month for up to four hours online time, beyond which you pay \$2.75/hour. Open only at night and on weekends.

### Real People

*American PeopleLink* is a text-based social and game-playing network open during prime and non-prime-time hours. *American PeopleLink*; \$15 to join, \$4.95/hour non-prime-time access, \$11.95 (300 baud) and \$12.95 (1200 baud) for prime-time access.

### Link Up

*QuantumLink*, designed for Commodore users, offers dozens of programming clubs and thousands

of public domain programs for downloading, news and information services, weather updates, online shopping, multiplayer games and educational services. You can also download and preview commercial software. *QuantumLink Computer Services*; \$9.95/month, plus \$3.60/hour for certain "Plus" services.

### Go to The Source

*The Source* offers its services to businesses and professionals, with up-to-the-minute commodity prices, news and commentary; continuous updates on prices from six domestic and three overseas exchanges; and 200 news items per day, covering the weather, the White House and worldwide developments affecting commodities. Its *Investext* investment service provides access to 38 international investment banking firms. Subscribers can use *The Source's* service, *MicroSearch*, giving access to thousands of article abstracts from over 100 computer-industry publications. *The Source* also has computer clubs, including one for Commodore users. *The Source*; \$49 to join, \$8/hour (300 baud) non-prime-time access and \$21/hour (300 baud) during daytime hours, \$10 (1200 baud) non-prime-time access and \$25 (1200 baud) during the day.

## OTHER HARDWARE

### The Quick Brown Box

*Double Quick Brown Box* has a switch to let you toggle between modes. The software included in the package lets you load the cartridge with a group of programs of your own choice. *Brown Boxes, Inc.*; C-64 and C-128; \$69.

### Programmer's Development System

The *Lt. Kernal* is a true programmer's development system, using its own interface and custom DOS. In 64 mode, it loads and saves about 65 times faster than a 1541, and in 128 mode, 135 times faster. It can be partitioned into ten logical units, with up to 15 separate user areas in each. An extended DOS provides over 40 commands, including an "erase" for saving a file you've just scratched. *Xetec*; C-64 and C-128; \$899.95.

### Tiny Drive Does a Big Job

The 3½-inch disk drive is rapidly becoming the standard in the computer industry, and Commodore has joined the club. Its 1581 drive weighs about three pounds and measures a mere 8½ by 5 by 2½

inches. It requires double-sided disks, which are completely enclosed in a rigid plastic case that protects them from some environmental damage that would ruin a 5¼-inch floppy. The drive has a whopping 808K of storage, and it can handle many more directories than either the 1541 or 1571. *Commodore Business Machines*; C-64 and C-128; \$249.95.

### Talk Back

*Hearsay 1000* is a voice-recognition synthesis system that plugs into your computer so you can talk to your software and your software can talk back to you. *Hearsay*; compatible with most commercial software; \$79.95.

### More Memory

The 1764 RAM Expander boosts your C-64's available memory by 256K, to a grand total of 340K. You can leave it permanently plugged into your 64's expansion port, since it doesn't interfere with any program or hardware operations. *Commodore Business Machines*; C-64; \$149.

## PARTY GAMES

### What Do You Know?

*Mind Pursuit* is a test of intelligence, knowledge and trivia and includes thousands of questions for both adults and children in the realms of science and nature, history and geography, sports, culture and entertainment. Your goal is to bury the opposition beneath an avalanche of points, in a race to the finish, complete with shortcuts, free-move bonus squares and tokens. *Datasoft*; C-64; \$29.95.

### For TV Game Show Junkies

*Wheel of Fortune*, *Family Feud* and *Jeopardy* are based on the game shows of the same names. *ShareData Inc.*; C-64; \$9.99 each.

### Trivial Trivia

If you enjoy playing trivia games, look into *Interstel's Quizam!*, because it genuinely depends on the computer to select and display questions, evaluate your answers, keep a running score for each player, display a game board and provide musical accom-





## PRINTERS

paniment to game play. You can play on any of eight game boards at any of eight levels of difficulty, with over 2000 questions in two categories, Fun Facts and School Days. Electronic Arts; C-64; \$29.95.

### That's Not a Word!

As in the original game of Scrabble, players build words using letters, each with a numerical value. The wordsmith with the highest number total wins the game. Computer *Scrabble* includes a playing vocabulary of about 12,000 words and a built-in spelling checker to resolve arguments. Electronic Arts; C-64; \$32.95.

### Murder, Anyone?

In *Make Your Own Murder Party*, players are invited to host their own evening of dinner and amateur sleuthing. You select one of two scenarios. In one scenario, a group of friends get together to remin-



isce about their college days in the '60s, and you try to figure whodunit. In the other scenario, members of a rich and powerful family are the suspects. As your party unfolds, clues are revealed until the murderer is caught. Electronic Arts; C-64; \$39.95.

### An Improvement

Designed to interface to Commodore computers with a special Star Micronics cartridge, the *NL-10* possesses as many print features as you're likely to find on any low-end dot matrix printer. It's been improved with a cartridge ribbon instead of a spool ribbon and a detachable paper guide for single-feed forms. In addition, the removable tractor feed mechanism has been replaced by a non-removable, adjustable tractor unit, which reduces wasted paper by pushing continuous-feed paper through the printer. Star Micronics; C-64 and C-128; \$379 (includes interface).

### Fine Print

The *Panasonic KX-P1091*, very popular among Commodore owners, has a matrix density of 18 x 18 dots, which is about the best quality you'll find in low-end dot matrix printers. The 14½-pound printer requires a parallel interface to work with Commodore computers, and its cassette ribbon has a life expectancy of three million characters. It prints faster than most of its competing machines, with 120 cps in Draft mode and 29 cps in NLQ mode. Panasonic; C-64 and C-128; \$399.

## PRODUCTIVITY

### Wow! Are You Using an Amiga?

*GEOS*, a graphic environment operating system, lets you manipulate icons, windows and pull-down menus—just as on the Amiga and Apple Macintosh. Berkeley Softworks; C-64 version, \$59.95/C-128 version, \$69.95.

### Partners

*Partner 64*, a 64K, 40-column, cartridge-based desktop accessory program, gives you eight memory-resident accessories that operate as if temporarily freezes any program you're running so that you can use its appointment calendar and datebook, memo pad, phone list and autodialer, name and address list, calculator, typewriter, label maker and envelope addresser. Partner 128 contains the features of Partner 64, plus it works in 80-Column mode. Time-

works; C-64 and C-128; \$59.95 and \$69.95, respectively.

### Six for the Price of One

*Productivity Pak III* contains the RUN Script Plus word processor for the C-64 and C-128, which has been upgraded with a spelling checker, label-printing and RAM-expander capabilities, and the ability to load files and issue disk commands from a disk-directory listing; RUN Calc, an electronic spreadsheet that can be used for calculations ranging from checkbook balancing to complex investment analysis; RUN File 1.0, a database designed to do all the management tasks involved in keeping records; RUN Investor; RUN Dex; and RUN Notepad, which lets you keep notes during a program run. C-64 and C-128; CW Communications/Peterborough; \$19.97.

## SPORTS

### Arena

*SuperStar Ice Hockey* is three games in one. As a player, you take the ice as center or goalie; as coach, you set up and rotate your players' lines; and as manager, you trade and draft players. Mindscape; C-64; \$34.95.

### Fore!

*World Class Leader Board* features a driving range; practice putting green; trees; traps; water; top views of each hole, showing the position of balls in play; replicas of Cypress Creek, Doral Country Club and St. Andrews courses; plus the Gauntlet Country Club, designed to be the ultimate test that would give even the Golden Bear nightmares. Access Software; C-64; \$39.95.

### Design Your Own Course

What other game opens up with the player designated as that great comeback golfer, Jack Snicklaus, who you can customize, rename and save to disk so you can develop your own Arnie's army of golfers? And, if you can't master the EA Championship course in *World Tour Golf*, then design your own! Electronic Arts; C-64; \$34.95.

## SOFTWARE FROM MOVIES

### Get Them Out of There!

In *Aliens: The Computer Game*, you must do everything in your power to save not only your own life but also the lives of your crew, from the attacks of those horrible, carnivorous creatures. Activision; C-64; \$34.95.

### Danger Zone

*Top Gun* puts you in the fighter pilot's seat of an F-14 Tomcat. Use your heat-seeking missiles and 20mm rapid-fire cannon to engage the enemy in a deadly dogfight, or compete against another player. Mindscape; C-64; \$9.95.





## SPREADSHEETS

### Up and Running in 20 Minutes

*Multiplan*, a full-featured spreadsheet and financial modeling tool, includes templates for home or business use for financial planning, loan analysis, depreciation, family budget and income tax preparation; windows; linked worksheets; built-in financial, mathematical and statistical functions; alphabetic and numeric sorting; and flexible formatting. The package also has a Quick Start manual to get you up and

running in less than 20 minutes. Epyx; C-64 and C-128; \$59.

### Make a 100-Yard Spreadsheet

With *Swiftcalc 128*, an 80-column spreadsheet, you can add pie charts, vertical bar charts, scatter diagrams, line graphs and three-dimensional staggered bar charts. Its Sideways option lets you print out one continuous sheet. Timeworks; C-128; \$69.95.

## TELECOMMUNICATIONS

### Being There

If you know someone who never leaves the house, get them *SpeedTerm*, a command-driven terminal software package through which they may communicate with others via bulletin board systems and on-line services. Supports Xmodem and Punter file transfer protocols. Abacus; C-64 and C-128; \$39.95.

### Edit On-Line

*BobsTerm Pro 128* offers a full-screen text editor and on-screen status display of available space in

the 60K buffer. You can edit files while it reads, writes, uploads and downloads to any disk type. Progressive Peripherals & Software; C-128; \$79.95.

### Traditional Telegaming

Three telegames—*Trapdoor Checkers*, *Baudleships* and *Radical Chess*—incur no connect charges, since no commercial online network is needed. All three games are based on the traditional games of checkers, battleship and chess, with a twist. Bear Graphics Software; C-64; \$24.95 each.

## WORD PROCESSORS

### Take a Letter

*PaperClip 128* has fast processing speed, easy operation and automatic startup, and its document size expands to accommodate 999 lines of text. Electronic Arts; C-128; \$89.95.

### An Improvement

*Fleet System 4* has been improved over earlier versions to include word wrap, on-screen bold and underlined text, and the ability to see how your text will look printed out. Another new feature lets you save, as default settings, your printer configuration, secondary address, linefeed option and screen colors, and then temporarily change or adjust these settings from within the program. Comes with PSI's database, Fleet Filer. Professional Software, Inc.; C-128; \$79.95.

### Fond of Fonts

*Fontmaster 128* lets you use up to nine different fonts on a single document, and several text modifiers or embedded commands can be used to change pitch; to select micro, normal or tall charac-

ters; or to toggle bold, underlined, italic, compressed and expanded type, as well as super- and subscripts. It's compatible with over 100 printers and 20 interfaces. There are a number of foreign language fonts such as Hebrew, Russian, French and German and 52 other fonts to choose from. Xetec; C-128; \$59.95.

### Work in 40 or 80 Columns

*Word Writer 128* works in both 40- and 80-Column modes. Features include on-screen highlighting to print out underlined, italicized and boldfaced words, sub- and superscripts and headers and footers. Timeworks; C-128; \$69.95.

### Control Your Documents

*WordPro 128/S*, with proportional printing, relies on commands you embed in the text to control the format and layout of your printed document. The flip side of the program disk has a 90,000-word dictionary, with room to add 10,000 more. It works with over 100 different printers. Spinnaker Software; C-128; \$39.95.

## UTILITIES

### Every Which Way But Loose

*Blowup* makes a hard copy of your screen—even bit-mapped high-resolution pictures and sprites, prints it in normal or reversed image, rotates the picture for horizontal or vertical printout, crops the picture and enlarges and reduces it. Data Share, Inc.; C-64; \$59.95.

### Fix It Yourself

The *Programmer's Tool Box* has a trace function, automatic line numbering and several disk options such as listing programs off of disk and reading text files without loading them. You can use the functions as needed, without the utility getting in the way. Includes the Pal 64 macro assembler to give you machine language capability. Spinnaker Software; C-64; \$19.95.

### Take Work Home

If you use an IBM or compatible at work and a C-128 and 1571 disk drive at home, you might appreciate *The Big Blue Reader* program, which transfers ASCII files written with MS-DOS computers into Commodore-compatible sequential files, or vice versa. That way, you can bring work home for the holidays, weekends and vacations. S.O.G.W.A.P.; C-128; \$39.95.

### Finally

Highlights of *The Final Cartridge* are an enhanced Basic, providing 20 new commands; an ML monitor, which uses no computer memory; a screen freezer; the ability to print a frozen screen; and faster disk-loading. H & P Computers; C-64; \$44.95.

## UNUSUAL USES

### My Foot!

You can never go too far with the uses you can find for computer chips. The *RS Computer Shoe* has one built into its heel, which records your run, then communicates the results to your computer for analysis. Puma; C-64; \$199.95.

### Trace Your Family Tree

*Family Roots* offers genealogy fans individual and group sheets, charts, name indices, general search and text capabilities. Adapts to most disk drives, printers and screens. Manual included. Quinsept; C-64; \$185. ▶





# MANUFACTURERS' ADDRESSES

**Abacus Software**  
PO Box 7211  
Grand Rapids, MI 49510

**Access Software, Inc.**  
2561 South 1560 West  
Woods Cross, UT 84087

**Accolade**  
20833 Stevens Creek Blvd.  
Cupertino, CA 95014

**ActionSoft**  
201 West Springfield Ave.  
Champaign, IL 61820

**Activision**  
2350 Bayshore Frontage Rd.  
Mountain View, CA 94043

**American PeopleLink**  
3215 N. Frontage Rd., Suite 1505  
Arlington Heights, IL 60004

**Bantam Books**  
666 5th Ave.  
New York, NY 10103

**Barron's**  
113 Crossways Park Drive  
Woodbury, NY 11797

**Bear Graphics Software**  
PO Box 12206  
New Brighton, MN 55112

**Berkeley Softworks**  
2150 Shattuck Ave.  
Berkeley, CA 94704

**Blue Lion Software**  
PO Box 650  
Belmont, MA 02178

**Broderbund Software**  
17 Paul Drive  
San Rafael, CA 94903

**Brown Boxes, Inc.**  
26 Concord Rd.  
Bedford, MA 01730

**CWCommunications/  
Peterborough**  
80 Elm St.  
Peterborough, NH 03458

**Commodore Business Machines**  
1200 Wilson Drive  
West Chester, PA 19380

**CompuServe  
Information Services**  
5000 Arlington Centre Blvd.  
Columbus, OH 43220

**Data Share, Inc.**  
717 S. Emporia  
Wichita, KS 67211

**Datasoft**  
19808 Nordhoff Place  
Chatsworth, CA 91311

**Digital Solutions, Inc.**  
2-30 Wertheim Court  
Richmond Hill, Ontario  
Canada L4B 1B9

**DLM**  
One DLM Park  
Allen, TX 75002

**Electronic Arts**  
1820 Gateway Drive  
San Mateo, CA 94404

**Epyx, Inc.**  
1043 Kiel Court  
Sunnyvale, CA 94804

**Firebird**  
PO Box 49  
Ramsey, NJ 07446

**General Electric  
Information Services Co.**  
401 North Washington St.  
Rockville, MD 20850

**General Videotex Corp.**  
3 Blackstone St.  
Cambridge, MA 02139

**Great American Software**  
PO Box 910  
Amherst, NH 03031

**H & P Computers**  
154 Valley St.  
South Orange, NJ 07079

**Hearsay, Inc.**  
1825 74th St.  
Brooklyn, NY 11204

**Hi-Tech Expressions**  
1700 NW 65th Ave., Suite 9  
Plantation, FL 33313

**Howard W. Sams & Co.**  
4300 W. 62nd St.  
Indianapolis, IN 46268

**HP Books**  
PO Box 5367  
Tucson, AZ 85703

**Infocom**  
125 CambridgePark Drive  
Cambridge, MA 02140

**Inkwell Systems**  
PO Box 85152 MB290  
San Diego, CA 92138

**Insight**  
2708 Arlington Ave.  
Highland Park, IL 60035

**Merrill Ward & Associates**  
255 N. El Cielo Rd., Suite 222  
Palm Springs, CA 92262

**Microcube Corp.**  
PO Box 488  
Leesburg, VA 22075

**MicroProse Software**  
120 Lakefront Drive  
Hunt Valley, MD 21030

**Mindscape, Inc.**  
3444 Dundee Rd.  
Northbrook, IL 60062

**Panasonic**  
2 Panasonic Way  
Secaucus, NJ 07094

**Patech Software**  
PO Box 5208  
Somerset, NJ 08873

**PlayNet, Inc.**  
PO Box 587  
Wynantskill, NY 12198

**Prentice Hall Press**  
One Gulf + Western Plaza  
New York, NY 10023

**Professional Software, Inc.**  
51 Fremont St.  
Needham, MA 02194

**Progressive Peripherals  
& Software**  
464 Kalamath St.  
Denver, CO 80204

**Puma U.S.A., Inc.**  
492 Old Connecticut Path  
Framingham, MA 01701

**QuantumLink  
Computer Services**  
8619 Westwood Center Drive  
Vienna, VA 22180

**Quinsept**  
PO Box 216  
Lexington, MA 02173

**ShareData, Inc.**  
7400 W. Detroit St., Suite 170  
Chandler, AZ 85226

**Simon & Schuster Software**  
One Gulf + Western Plaza  
New York, NY 10023

**S.O.G.W.A.P. Software**  
611 Boccaccio Ave.  
Venice, CA 90291

**The Source**  
1616 Anderson Rd.  
McLean, VA 22102

**Spinnaker Software Corp.**  
One Kendall Square  
Cambridge, MA 02139

**Star Micronics**  
200 Park Ave., Suite 3510  
New York, NY 10166

**SubLogic**  
713 Edgebrook Drive  
Champaign, IL 61820

**Suncom**  
260 Holbrook Drive  
Wheeling, IL 60090

**Tech Sketch, Inc.**  
40 Vreeland Ave.  
Totowa, NJ 07511

**Timeworks**  
444 Lake Cook Rd.  
Deerfield, IL 60015

**Weekly Reader Family Software**  
245 Long Hill Rd.  
Middletown, CT 06457

**Wenger Corp.**  
1401 E. 79th St.  
Minneapolis, MN 55420-1590

**Xetec, Inc.**  
2804 Arnold Rd.  
Salina, KS 67401 ■



# Caveat Emptor

*As you peruse the RUN Holiday Gift Guide for gift-giving ideas, keep the following guidelines in mind.*

By ANNETTE HINSHAW

**Y**ou've probably heard the one about a computer that has no software or peripherals making a good doorstop. Well, a Commodore should never suffer that fate, because there are thousands of Commodore-compatible products on the market ready to entertain and assist the user. *RUN's* Holiday Gift Guide presents a smorgasbord of such products—useful, clever, high-quality or otherwise noteworthy items that have appeared, primarily within the last year, for the C-64 and the C-128. Chances are you'll find an appropriate gift for each Commodore user on your list, and maybe even something you can't resist for yourself.

However, before you shell out your hard-earned money for any of these products, you should ask yourself a few questions:

## IS IT APPROPRIATE?

Make sure you understand what the product does, and think about how it will fit your needs or those of the person you're giving it to. Don't buy a program just because it's cute or has appealing packaging. An electronic poker game is less fun than the real thing, and you can probably balance your checkbook with a hand calculator in less time than it would take on your Commodore. Unless the checkbook program is part of an effective money management tool, it has no real advantage over its noncomputer equivalent.

On the hardware side, a modem won't do much good for accessing national networks if you live in the country and can't afford the long-distance phone calls, and a mouse will be just a pest if it eats up too much space on your desk.

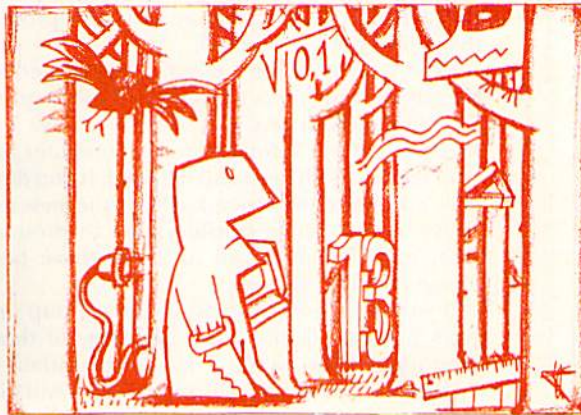
## WHICH PRODUCT IS BEST?

Define your goals and priorities before you buy. What product comes closest to reaching them at the price you want to pay, and is it close enough? What concessions must you make to arrive at a decision?

For instance, if you were thinking of buying accounting, recipe filer and mailing list programs—all databases—you could consider one database manager that would produce all three

and cost less than the individual programs combined. Remember, though, that using programs specifically designed for a task is faster, because it circumvents development time. If time is more important to you than cost, you might better buy the three ready-to-use programs.

Also remember that there are no set right and wrong answers. Is the power of a Hayes-compat-



ible modem worth the hassle and extra cost of getting an RS-232C interface for it? Probably not, if all you want to do is read messages on computer bulletin boards. But that answer changes when you get into serious telecommunicating.

Try to discern what features of a product you or your friend or relative will actually use. Are that spelling checker and those fancy fonts necessary in a word processor? Are you really going to print out your computer graphics or use special screen-design functions? Does your modem have to transmit at 1200 baud, or would 300 baud be just fine?

Computer-specific magazines like *RUN* often publish round-up articles that compare features of commercial products. You should study these articles, and ask other users about details you don't understand.

Never assume that the program with the most features is the best. It may lack the one thing ▶



you can't live without, or it may be too complex for your abilities or needs. Keep in mind that it's said 80 percent of the work done with any application program exploits only 20 percent of the program's features.

#### WHAT DOES THE LITERATURE SAY?

You or the recipient of your gift will be living with your choice for a long time, so don't decide what to buy until you've done your homework. Consult lists, like this Gift Guide, and make your own list of products that interest you. Then, gather all the information you can about them.

Don't let glitzy packaging and high-powered ad campaigns deceive you. Carefully read product specifications in the ads and on the packages, and, if it's available, read through documentation or literature from the manufacturer.

If you're looking for a C-128 program that runs in 128 mode, make sure the ad, package or literature says so or implies it by specifying an 80-column monitor or double-sided disks.

Note what the printed matter *doesn't* say. If an ad for a modem doesn't specify that it runs at 1200 baud, that it dials automatically or that it comes with software, it probably doesn't, even if the ad seems to suggest that it does.

If you're ordering by mail, invest in a phone call. It'll be cheaper than returning a product that isn't what you wanted.

Read reviews in computer magazines, and ask friends and members of your local user's group for recommendations. You could also leave messages requesting information on computer bulletin boards, both local and national. If you don't have a modem, ask a friend to leave the messages for you. Give prime consideration to products from manufacturers you or others have been pleased with in the past.

If your local retail outlet or user's group provides program demos, take advantage of them. Running a demo won't reveal all the pitfalls in a program, nor all of its beauties, but it will give you a feel for its basic operation.

#### IS IT COMPATIBLE?

It's too late to cry when you find out that a graphics program you bought is incompatible with your printer or that your favorite terminal program won't drive your new modem. Nothing is more frustrating than seeing your non-Commodore disk drive refuse to load a game or discovering your new C-128 spreadsheet doesn't have a 40-column mode. You're usually safe with Commodore hardware, but some programs won't work with some Commodore printer models.

Software can be incompatible with other software. Background utilities such as screen dumps and wedges won't work with other programs that use the same memory locations.

Software and hardware documentation may specify that two products work together. If it doesn't, perhaps you can borrow a copy of a program to try on your hardware or take your

software to another system before you buy. You can always call the manufacturer and ask for compatibility verification.

#### COMMERCIAL VS. NONCOMMERCIAL

If you're buying software and you're not sure what features to look for, the best bet may be a public domain or shareware program—available from user's groups and other sources—or a disk, like ReRUN, put out by a magazine. These programs are inexpensive and often easier to learn to use than their commercial counterparts, plus, by the time you master one and bump into its limitations, you'll know what you want and don't want out of a commercial product. And you may find you never need a commercial equivalent.

Generally, expect to pay \$50-\$100 for commercial productivity software such as word processors, databases, spreadsheets and terminal programs. The latest games are running \$30-\$50, while many older ones are being distributed for less than \$20. Educational software meant for schools is usually pricey—in the same range as productivity software—but educational programs meant for home use are about \$20-\$35.

Public domain and shareware programs, whether from a user's group, the author or specialized commercial firms, go for about \$5-\$15



per disk, with each disk containing several different programs.

For used hardware or software, expect to pay one-half to two-thirds the original price.

#### WHERE TO BUY?

An excellent place to buy a computer product is from a local dealer, especially one who'll help you learn to use the product and who has a generous return policy if it doesn't work out the way you hoped. Unfortunately, not many places like that exist for Commodore users. Barring a local dealer, you can probably be confident in buying top-rated products at discount stores. If you're very lucky, you can find used products in good condition.

Mail order offers the widest selection to choose from, and it doesn't have to be as risky as you might think. A lot of mail order firms are reputable and offer both good service and good buys. ▶

*"Give prime consideration to products you have been pleased with."*



# Take command of your computer system

Consolidate your 64, 64C or 128 system  
with the **Command Center**:



## Just look at all it includes:

- Built-in AC Power Strip with power surge and voltage spike protection, line noise filtering and power outlets.
- Built-in Drive/CPU Cooling Fan to prevent overheating.
- Modular Telephone Plug with its own on-line/off-line telecommunications switch. (Optional on 64 and 64C).
- Master AC Switch for easy system power up.
- Single or Dual Drive Configurations with the standard drive insert.



64..... \$119.95

## COMMAND CENTER ACCESSORIES

(Specify 128, 64, or 64C when ordering)

Dust Cover \$19.95 — covers entire system

Keyboard Cover \$19.95 — smoked acrylic

Drive Reset \$14.95 — one switch per drive

Short Serial Cable \$9.95 — for chaining drives

Modem Switch \$9.95 — 64/64C option

128..... \$149.95

64C..... \$129.95

Tilt/Swivel Monitor Stand \$14.95 — see below

Cartridge Port Extension Board — \$24.95



The Command Center will untangle your system.

(Call for details)

## "Sound Trap" acoustic enclosure

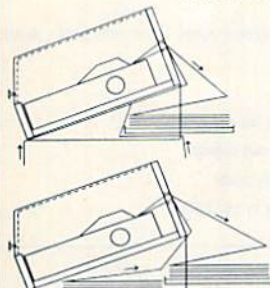
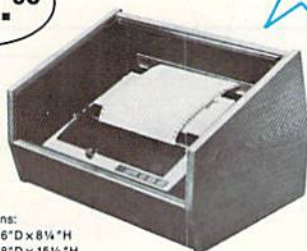
We offer the **total solution** to complete your "office at home" for the **special introductory price of only**

**\$99.95**

- Fits all popular 80 column printers, 132 column also available
- Sturdy wood construction
- Sound absorbing foam lining reduces printer noise up to 90%
- Tilted for easy printer viewing
- Attractive woodgrain finish compliments any surroundings
- Clear acrylic lid keeps sound in and dust out
- Unique slide-out shelf catches printout, eliminating the need for a costly catch-basket

Compare to other enclosures of similar quality and dimensions costing at least \$139.95! That doesn't include "extras" like a catch-basket and a stand to raise the enclosure which are already incorporated into our design!

Dimensions:  
Inside 20 1/2" W x 16" D x 8 1/4" H  
Outside 22 1/2" W x 18" D x 15 1/2" H



Unique design allows for many space-saving paper management configurations.



Cramped for extra space? Our optional cart is specially designed for use with the "Sound Trap". It has the same quality wood construction and casters for mobility.

**\$149.95**

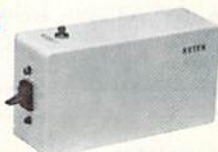
Shipping/Handling:  
Sound Trap \$12.00  
Cart \$19.00

Cart Dimensions: 24 1/2" W x 18" D x 25" H

The "Sound Trap" is available with an optional fan to dissipate heat build-up. Integrated AC outlet and master power switch activates both printer and fan. **\$49.95**

## Data Director

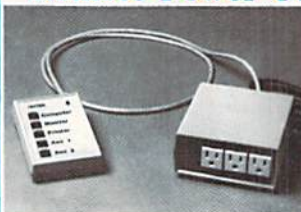
**\$39.95**



- Eliminates cable swapping.
- Saves wear on disk drive serial ports.
- Share two Commodore® 6-pin serial devices with one computer.
- Works with Commodore® compatible disk drives, printers, and all interfaces.
- LED indicates which device is in use.
- Convenient button resets device.

## Remote Power Controller

**\$129.95**



Compare to others costing \$199.95!

- 6-foot power cord
- Panel mounted fuse

Controller: 3 1/2" x 5 1/4" x 1 1/4"  
Base Unit: 5 1/2" x 5 1/4" x 2 1/4"

- Convenient push-button switches with power indicators for separate control of up to 5 devices
- For computers, monitors, printers, disk drives, etc.
- Five 120 V outlets provide 3-way protection against surges and spikes
- High-impact plastic base unit and controller are colored to compliment any system and are separated by a 6-foot cable for ease of placement
- Base unit mounts behind/under desk to keep your work area clear of unsightly cables
- In/out telephone jacks protect valuable communications equipment against phone line surges

## Shipping and Handling

Continental U.S.  
\$ 4.50 for each Command Center  
\$ 2.00 for one accessory item  
\$ 3.00 for two or more accessories

APO/FPO/Canada/Puerto Rico/  
Hawaii/Alaska  
\$13.00 for each Command Center  
\$ 4.00 for one accessory item  
\$ 6.00 for two or more accessories

© Commodore is a registered trademark of Commodore Electronics, Ltd.

**-KETEK**

P.O. Box 203  
Oakdale, IA 52319

\$2.00 charge for C.O.D. orders  
Iowa residents add 4% sales tax

Free 30-day trial offer  
and one-year warranty.

For faster service, call  
1-800-626-4582 toll-free  
1-319-338-7123 (Iowa  
Residents)

DEALER INQUIRIES INVITED



Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone Number \_\_\_\_\_



## CAVEAT EMPTOR

A few simple precautions can help you make sure you're dealing with such a company. See "Mail Order Maxims," *RUN*, May 1987, for helpful suggestions on purchasing through the mail.

Buying used programs and equipment is no different than buying new. Be careful in what you choose, and always see the product in operation before you pay for it. User's groups are good places to make connections on used products.

### A LOOK AHEAD

The Holiday Gift Guide may assist you in buying 1987 products, but what lies over the horizon? This wouldn't be a year-end article without predictions.

With the largest user base in the world, Commodore owners can expect to see a continuing flood of software—some jazzier, some more specialized and some less expensive than ever before. Low-cost European imports and domestic budget lines will drive prices down, especially for games.

I hope 1988 will be the year when the C-128 comes into its own, with many powerful new programs that exploit its special features. If the RAM expanders and hard-disk drives that came out in 1987 sell well, we may see some mem-

ory applications for Commodores. Laser printers are coming down in price, so serious desktop publishing should be filtering into the Commodore arena, too.

Accessories for interfacing computers to VCRs or stereo systems look promising, and I expect telecommunications to expand. Prices for using information services may drop, unless the FCC rate hike takes effect.

I bought my first VIC less than six years ago, and now I'm ready to buy a 512K RAM expander or a hard-disk drive for my 128. Much of the hardware and software I now own was beyond my reach six years ago—or so I thought—and I'll probably be saying the same thing six years from now.

Those of us who've been involved with computers these few short years see a revolution coming in the way we live our daily lives. It may be a generation before we see and understand the importance of what has already happened. On that note, I wish you all a Happy Holiday Season! ■

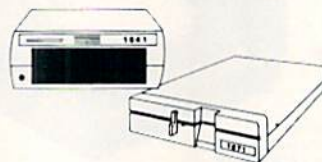
*Annette Hinshaw, founder of the Tulsa Area Commodore Users Group, has written extensively for computer magazines.*

### Super Disk Utilities

The ultimate utilities disk for the C128 & 1571. Included among its many features are:

- Two drive copy program for the 1571
- Single drive copy program for the 1571
- File unscratch utility
- Create auto-boot utility
- Lock & unlock files utility
- File copier for one or two 1571's
- Utility to format in 1541, 1571 or IBM system 34 format
- CP/M Plus disk copier
- Direct DOS commands
- Analyze disk format utility (including Commodore & alien disk formats)
- Write protect utility
- Disk Editor - Individually trace files, edit in hex or ASCII simultaneously, print in hex and ASCII to any sector on disk
- CP/M Plus disk editor
- RAM Writer - Read & write to drive RAM
- ROM Reader - Read drive ROM
- Assemble/Disassemble drive RAM & ROM
- Erase a track or bulk erase a disk
- Most utilities also work on 1541
- And much, much more!

A complete utilities disk for only \$39.95!



### 1541/1571 Drive Alignment

1541/1571 Drive Alignment reports the alignment condition of the disk drive as you perform adjustments. On screen help is available while the program is running. Includes features for speed adjustment and stop adjustment. Complete instruction manual on aligning both 1541 and 1571 drives. Even includes instructions on how to load alignment program when nothing else will load! Works on the C64, SX64, C128 in either 64 or 128 mode, 1541, 1571 in either 1541 or 1571 mode! Autoboos to all modes. Second drive fully supported. Program disk, calibration disk and instruction manual only \$34.95!

### THE COMMUNICATOR

Fastest, easiest, most efficient, most feature-packed terminal program for the C64. Among its many features are:

- Menu selected options
- User selected/defined baud rates
- Very large buffer capacity
- Macro Key options
- Send/receive files with or without X-modem protocols
- Video attribute options including 40, 64, 80 column display
- File conversion options include text to BASIC, Pet-ASCII to ASCII, program to image
- Terminal emulation capability includes Tektronix-4010 graphics protocol
- Alarm Clock/Timer
- Autodial features
- DOS Command menus, file copy utility
- Written 100% in assembly language
- Easy to use instruction manual

All these features and more for only \$39.95!

### FREE SHIPPING & HANDLING!

Order with check, money order, VISA/Mastercard. Illinois residents add 8% sales tax.



### CHRISTMAS CLASSICS

Place your C64 or C128 in a holiday mode with Free Spirit's renditions of these all-time Christmas favorites. Joy to the World, Deck the Hall, Twelve Days of Christmas, O Tannenbaum and Jingle Bells are among the over 40 songs included. Only \$9.95!

*Free Spirit Software, Inc.*

538 S. Edgewood  
LaGrange, IL 60525  
(312) 352-7323



# UTILITIES UNLIMITED, Inc.

12305 N.E. 152nd Street  
 Brush Prairie, Washington 98606

Orders taken 24 hrs. a day;  
 seven days a week.

Visa, M/C accepted.  
 If you wish to place your order by phone,  
 please call 206-254-6530. Add \$3.00  
 shipping & handling on all orders;  
 additional \$2.00 for COD.

**WE NOW HAVE  
 OVER 1000  
 PARAMETERS  
 IN STOCK!**

**Software Submissions Invited**  
 We are looking for HACKER STUFF:  
 parameters, telecommunications, print  
 utilities and the unusual.

Ad copy by RWS Ltd., Inc.

## SUPER PARAMETERS 500 PAK

At a time when many programmers are cutting back on writing parameters, we are going full steam! After getting several requests for parameters on many of the "oldies but goodies" **WE DID JUST THAT! ANOTHER 150: 500 DIFFERENT PARAMETERS** all in one pack. And these parameters are not on any of our regular 100 paks, this **FANTASTIC 5-DISK SET** is a value of over \$100 for less than 1/2.

**\$49.95**

## SUPER PARAMETERS 100 PAKS: 1 thru 4

... YOU GET 100 OF THE BEST PARAMETERS, ANYWHERE. Professionally done, easy to use, reliable, fast and full of performance. This package can remove all protection. Includes titles from all major software publishers for the C64/128.

**\$19.95**

## SUPER PARAMETERS 10 PAKS: 1 thru 40

These are the early releases of each 100 pak and we will send you a list on request.

**\$4.95**

## ALL PARAMETERS ARE TOP QUALITY—NO FILLER OR JUNK

## SUPER NIBBLERS COMBO! \*

For those who need a really super nibbler copier, for those hard to backup programs, we give you the **ULTIMATE COPY PROGRAM** \* and the **NIBBLE IN C-64 or C-128 MODEL**! This package includes: **100 PARAMETERS** and a **SUPER FAST FILE COPIER, ONLY**

**\$24.95**

## SUPER PARAMETERS—GEOS PAK

This #1 seller will standardize your **GEOS** series utilities to work with anyone else's **GEOS**. Parameters are included for these: **FONTPACK 1, DESKPACK 1, WRITERS WORKSHOP, GODEX &** **\$9.95**

**\$9.95**

## GEOPILE, THE ORIGINAL STANDARDIZER for just

- ★ ★ ★ ★ ★
- ★ **PARAMETERS CONSTRUCTION SET** ★
- ★ The company that has **THE MOST PARAMETERS** is about to do something **UNBELIEVABLE**. We are giving you more of our secrets. Using this **VERY EASY** program, it will not only **READ**, ★
- ★ **COMPARE** and **WRITE PARAMETERS FOR YOU**: it will also ★
- ★ **CUSTOMIZE** the disk with your name. It will impress you as well as your friends. The "PARAMETER CONSTRUCTION SET" is ★
- ★ like nothing you've ever seen. In fact, you can even **READ** ★
- ★ **PARAMETERS** that you may have already written; then by using ★
- ★ your construction set rewrite it with your new **CUSTOMIZED** ★
- ★ **MENU, DON'T WAIT** for months for that one **\$34.95** ★
- ★ special parameter: **WRITE IT!** ★
- ★ **REMEMBER FOLKS, YOU SAW IT HERE FIRST!** ★
- ★ ★ ★ ★ ★

## THE 128 SUPERCHIP

There is an empty socket inside your 128 just waiting for our **SUPER CHIP** to give you 32k worth of great **BUILT-IN UTILITIES**, all at just the **TOUCH OF A FINGER**. You get built-in features: **FILE COPIER, NIBBLER, TRACK & SECTOR EDITOR, SCREEN DUMP**, and even a 300/1200 baud **TERMINAL PROGRAM** that's 1650, 1670 and Hayes compatible. Best of all it doesn't use up any memory. To use, simply touch a function key, and it responds to your command. **ALSO INCLUDES 50 parameters—FREE!**

All this for **\$29.95**

## ADULT GAME & GRAPHICS DATA DISKS

**GAME!** A very unusual game to be played by a very **OPEN MINDED** adult. It includes **DATA** \* This **POPULAR** disk works with **PRINT SHOP** and **PRINT MASTER**.

**\$24.95** ea.

## THE FINAL CARTRIDGE C-64 and C-128

**THE #1 SELLING CARTRIDGE IN EUROPE!** After reviewing all utilities of this type, including Icepick, Capture, and super snap shot, we determined that **THE FINAL CARTRIDGE** is just that: **THE LAST CARTRIDGE THAT YOU WILL EVER NEED**. **EXTENSIVE** programming utilities for both beginner and the hardcore programmer alike. The most impressive utility for **MEMORY TO DISK BACKUP** that we have ever seen. We were able to copy almost every program we tried with just the **PRESS OF THE BUTTON**. Now, you may have seen a comparison of **FINAL CARTRIDGE** to super snap shot by a dealer. It is our opinion that they only printed the few items they felt were in its favor (**NOT ACCURATELY**) and failed to list all the **FAR SUPERIOR FEATURES OF THE FINAL CARTRIDGE**. Come on guys, let's be fair. To get a much better **UNBIASED OPINION**, see great reviews of **FINAL CARTRIDGE** in: **RUN**, Sept. 87, pg. 78-80; "A conventional review doesn't do *The Final Cartridge* justice—*fun* at this price is a rarity." **GAZ**, July 87, pg. 44; "I can't begin to think of a cartridge which does so many useful things." **AHOY**: Nov. 87, pg. 63; "Overall we were quite pleased." **INFO**: Aug. 87, pg. 33; "A super hacker's cartridge!"

**READ THEM, THEN YOU DECIDE! ONLY \$47.95**

## CLOSE-OUT OF Megasoftware #1 SELLERS

— PRICED TO MOVE —

- 64 BBS; for 1 or 2 drives . . . . . \$19.95
- 64 MODEM prg.; w/wargames auto dialer . . . . . \$14.95
- N-CODER & D-CODER: together for only . . . . . \$14.95
- GRAPHIC LABEL MAKER: the original . . . . . \$12.95
- D-COMPLIER: for the famous BLITZ! . . . . . \$14.95
- PHOTO COPY; reviewed in **RUN** magazine . . . . . \$12.95
- MSD SHURE COPY; make your MSD hum . . . . . \$14.95
- OTHER SPECIALS —
- HEAVY DUTY REPAIRABLE 64 POWER SUPPLIES . . . . . \$39.95
- Most expensive C64 repairs are due to a faulty power supply. Don't wait; replace yours now!!
- CLOSE-OUT OF KRACKER-JAX 64 RESET BOARDS . . . . . \$3.95
- DISK NOTCHERS: double disk capacity . . . . . \$4.95
- SECURITY NETS: lost your dongle? . . . . . \$3.95 (for golf or bowling games)

## LOCK PIK—THE BOOKS—for the C64 and C128

Lock Pik 64/128 was put together by our crack team, as a tool for those who have a desire to see the **INTERNAL WORKINGS** of a parameter. The books give you **STEP-BY-STEP INSTRUCTIONS** on breaking protection for backup of 100 popular program titles. Uses **HESMON** and **SUPEREDIT**. Instructions are so clear and precise that anyone can use it. \* **OUR BOOK TWO IS NOW AVAILABLE!**

**BOOK 1:** Includes Hesmon and a disk with many utilities such as: **KERNAL SAVE, I/O SAVE, DISK LOG FILE** and lots more, all with instructions on disk. A long-time favorite of many.

**BOOK 2:** 100 NEW PARAMETERS, Hesmon on disk, and more utilities to include: **A GENERAL OVERVIEW ON HOW TO MAKE PARAMETERS** and a **DISK SCANNER**.

**\$29.95** each

OR BUY BOTH FOR ONLY **\$49.95**

★ = AN IBM and ST VERSION IS ALSO AVAILABLE

## C-64 and C-128 BURST ROM CHIPS

Let's your C-64 run in "BURST MODE" when using a 1571 or 1581 disk drive. Loads 100 disks in 6 sec. (1571 and 4 sec. (1581). Features: fast directory, SEQ, and REL, file access and built-in **DOS WEDGE**. Simple installation. Kernel ROM U4 must be socketed. C-128 version has same features as above. For use in 64 mod.

C-64 **\$29.95**

C-128 **\$35.95**



**COMMODORE**<sup>®</sup>

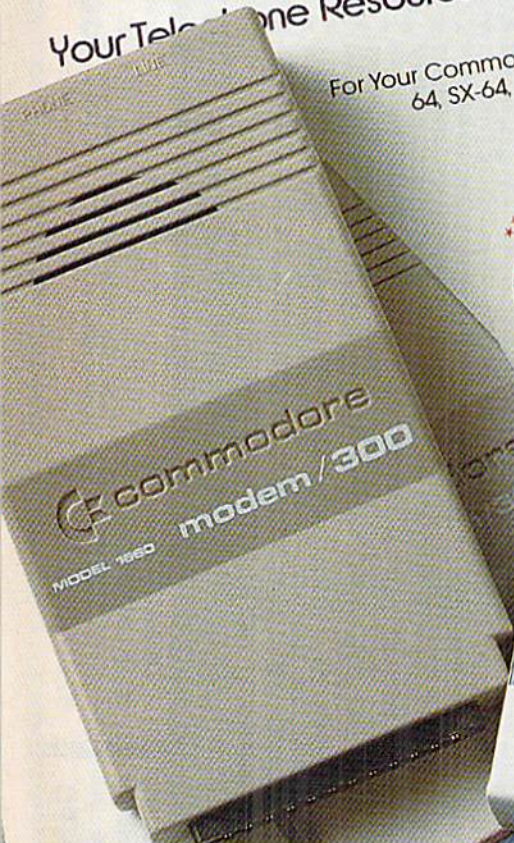
**MODEM  
300**

**SAVE TIME AND MONEY.**  
Important information...FAST.

Communications may be your ticket to personal success!

Your Telephone Resource Center

For Your Commodore 128  
64, SX-64, or VIC-20



commodore  
modem/300

COMMODORE<sup>®</sup> PRESENTS **QuantumLink**<sup>SM</sup>

Suggested \$9.95

The Online Service that's Easy-to-Use,  
Inexpensive, Useful and Fun!



Your participation in a  
**\$500,000  
TREASURE HUNT**  
Details on QuantumLink  
services when price  
is found satisfactory!

Telecommunications Starter Kit

Includes  
**ONE MONTH FREE**  
\$9.95 Value!

You get your second month free  
when you pay for the first.

QuantumLink is owned and operated  
by Quantum Computer Services, Inc.

Requires

Commodore 64<sup>®</sup>  
or 128<sup>™</sup>



Disk Drive



Telephone Modem

FOR YOUR **COMMODORE 128 or 64**  
**QuantumLink** Software Disk



# Bring your **COMMODORE®** to life with a **FREE** modem and software!

Now you can plug your Commodore into an exclusive network that's useful, easy, fun and affordable. Join Q-Link now, and we'll give you a free modem and software to get you started.

## Your official source of Commodore support.

Because Q-Link is offered exclusively to Commodore owners, you get the most relevant and useful services—including a hotline to Commodore Business Machines for fast answers to your questions...the GEOS Arena to help you get the most out of your GEOS software... "live" conferences with Berkeley Softworks and other software publishers such as Electronic Arts, Activision, to name a few... and user group support.

## You'll never be alone.

Meet and chat live with new friends from all over the U.S. and Canada. Participate in exciting full-color, multi-player games like RabbitJack's Casino (including Blackjack, Poker, Bingo and the Slots), Chess and Backgammon. Send and receive electronic mail. Join group discussions or start a special interest group of your own. Compete in contests and win prizes.

## Save money every day.

Expand your software library with more than 10,000 free public domain programs — games, graphics, business and educational software, and much more! Sample "hot" software before you buy. Comparison shop for the lowest prices on more than 250,000 items. Get the lowest-priced airline tickets, rental cars and hotel rooms using American Airlines Eeasy Sabre<sup>SM</sup> Travel Service.

Offer valid while supplies last and only for new members in the continental U.S. and Canada. Expires 6/30/88. Prices subject to change. There is a communications surcharge for connection to Q-Link from Canada: 6 cents (U.S.) per minute from Montreal, Vancouver, Ottawa, Toronto, Quebec, Windsor, Kitchener, and Calgary using Tymnet network, and 15 cents (U.S.) per minute for over 85 other locations using the DATAPAC network.

Commodore is a registered trademark of Commodore Electronics, Ltd. Q-Link is a servicemark of Quantum Computer Services, Inc. Grolier's Academic American Encyclopedia is a trademark of Grolier Electronic Publishing. GEOS and Berkeley Softworks are tradenames of Berkeley Softworks.

## The easiest online service to use.

When you join Q-Link, you'll receive customized software that does all the work for you. You don't have to memorize any complicated commands. To select what you want to do, simply choose from colorful, easy-to-use menus.

## The lowest priced, full service Commodore network.

For only \$9.95 a month, you'll enjoy unlimited access to a wide range of services — including the latest news, entertainment updates, Grolier's Academic American Encyclopedia, and help from experts at Commodore. Special "Plus" services, including online tutoring and software previews, cost only 8 cents per minute. And your first hour of Plus usage for each full month of membership is free!

With Q-Link, you can sharpen your computer skills...connect with people... discover new ways to get smart...save money every day... plus have a lot of fun!

**For fastest service, call toll free 1-800-782-2278 Extension 1235 or clip and mail this coupon to Q-Link, 8619 Westwood Center Drive, Vienna, VA 22180.**

### Q-LINK RESERVATION FORM

#### Choose one:

**I need a modem.** Start my Q-Link membership by charging me now for my first 4 months at \$39.80, and send me the FREE Q-Link software and a FREE Commodore 300 baud auto-dial modem (model 1660—retail value \$59.95).

**I already have a modem.** Send me my FREE Q-Link software and start my Q-Link membership by charging me now for my first month of membership at \$9.95.

Full Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Evening phone (\_\_\_\_\_) \_\_\_\_\_

#### Choose your method of payment:

Please charge my credit card.  Check enclosed.

Master Card  Visa

Acct# \_\_\_\_\_ Exp. \_\_\_\_\_

Signature \_\_\_\_\_

**Call toll-free 1-800-782-2278 Ext. 1235 or mail this coupon to:**  
Q-Link, 8619 Westwood Center Drive,  
Vienna, VA 22180



The Commodore Connection.







# Commodore Clinic

*In this RUN Special Issue, as in the last, we are publishing highlights from our popular Commodore Clinic column. There follows a selection of those questions and answers from 1987 Clinics that should be most helpful to you. The table of contents below directs you to the software, hardware, programming and other topics we've included.*

---

## COMMERCIAL SOFTWARE

- 1. PRODUCTIVITY .....28
- 2. EDUCATION, GRAPHICS, ENTERTAINMENT .....29
- 3. UTILITIES .....30

## PROGRAMMING

- 4. BASIC .....30
- 5. DEBUGGING .....31
- 6. DISK & FILE HANDLING .....31
- 7. MACHINE LANGUAGE .....60

## HARDWARE

- 8. CHIPS & CONNECTIONS .....60
- 9. GENERAL .....61
- 10. INPUT DEVICES .....61
- 11. DATA STORAGE DEVICES .....61
- 12. OUTPUT DEVICES—VIDEO .....63
- 13. OUTPUT DEVICES—AUDIO .....63
- 14. OUTPUT DEVICES—MODEMS .....63
- 15. OUTPUT DEVICES—PRINTERS .....63
- 16. SPECIFIC COMPUTERS .....66

## MISCELLANEOUS

---

By **JIM and ELLEN STRASMA**



**COMMERCIAL SOFTWARE**

**Productivity**

**Q** Can you recommend any good sources of information on starting a home business, such as doing word processing or maintaining mail lists?

—DIANE HIEM  
HIGHLAND, IL

**A** The most helpful resource I ever found along those lines was the book *The Incredible Secret Money Machine*, by Don Lancaster. Don was a true pioneer of the microcomputer revolution and has been quite successful over the years making a living working at home. This book details his methods.

A more recent resource specifically for Commodore owners with small businesses is *Money Machine*, a bi-monthly magazine from Redwood Empire, PO Box 6609, San Mateo, CA 94403.

**Q** A program I wrote is about 8K long and loads in less than three seconds. However, data from one of my *Swiftcalc 128* spreadsheets takes six minutes to save. Why is there such a drastic difference in speed?

—BRIAN HARDING  
CARROLLTON, TX

**A** Several factors make loading a program much quicker than saving spreadsheet data. First, when you load a program, there's no question about where the information will go or where the next sector in the program is located. The first two bytes of the program are its load address, and each sector includes all the information needed to find the next sector in the program.

A save, on the other hand, first needs to find space for each new sector of data in turn, without any quick way for the disk drive to know in advance how many sectors will be needed in all. Also, it has to link all the sectors together so they can be read or loaded later.

Second, you load a program, as a single operation, into a block of contiguous memory. However, when you save data, it's written from a much smaller buffer area, which means only a small part of the total file can be written at a time.

Third, if the computer has to change any string variables, it may require occasional time-outs to get rid of unneeded strings created by the file-save operation. There'll be short periods

when the computer seems to go dead, then resumes as though nothing had happened.

Finally, your spreadsheets may be much larger than 8K. One spreadsheet I use allocates as data every cell to the left of or above any cell in which I have written anything, even if I erase the cell. This can dramatically increase the space taken up by a spreadsheet.

If the time delay matters a lot to you, try another spreadsheet. I can't ever recall having to wait more than a minute or so for a spreadsheet to save its data.

**Q** Where can I get a replacement disk for *The Manager database*?

—KAREN LANDRETH  
FLORENCE, SC

**A** Packed with your original program disk and manual is a card telling you how to get a replacement disk directly from Commodore. Send the original disk to Customer Support at Commodore Business Machines (1200 Wilson Drive, West Chester, PA 19380), with a check for \$5.

**Q** I'm using *Timeworks' Data Manager 128* with a 1571 disk drive. I've entered 230 four-page records, but when I enter record number 231, I get error number 52, *File too Long*. Why is this, when the disk directory still shows 588 blocks free?

—STEVE BRICHTER  
NEW WINDSOR, NY

**A** Although a single sequential file can grow indefinitely within the limits of the disk, a single relative file has a limited size—something C-64 owners didn't have to worry about because the limit is slightly larger than the capacity of a 1541 disk.

When this problem last surfaced, back in the days of the Commodore 8096 computer and 8050 disk drive, programs like *Silicon Office* solved it by treating two or three separate relative files as though they were part of the same one. You can do something similar by putting all your records whose keys start with the letters A-M in one file, and all those whose keys start with N-Z in a second file. This is not an ideal solution (especially when you need a zip-code-sorted report), but it may be your only solution until either programs like *Silicon Office* appear for the C-128 or Commodore expands the capacity of relative files, as they did for

the 8250 disk drive during the last days of the PET.

**Q** Does Ashton-Tate make *dBase* for the C-64? If not, is there a program like or better than *dBase II* or *III* for the C-64?

—ROBERT GOYER  
HUNTSVILLE, AL

**A** The CP/M version of *dBase II* has been used successfully on the C-128 in CP/M mode, but I'm not aware of any plans by Ashton-Tate to offer products for the C-64. Precision Software's *Superbase 64* offers many of the same features, including multiple related files and a command language. This program has been popular with Commodore owners for several years.

**Q** Is there a terminal program for the C-64 that dials numbers having a specific prefix and saves the ones that answer with a computer tone?

—JEREMY MAPPUS  
AUSTIN, TX

**A** Programs that do what you ask do exist. One was even featured in the movie *WarGames*, where it got its user into deep trouble. Morally and legally, however, there is almost no defense for their use, and it might even be illegal for me to help you find one.

Just because a computer answers the phone doesn't give you the right to access it. Laws regarding this are getting more strict, and properly so. If you insist on getting into a computer uninvited, limit your explorations to trying the programs *Hacker* and *Hacker II* from Activision. That way, your next letter to the Clinic won't have to be mailed from the clink.

**Q** I'm interested in setting up a modem bulletin board service. I have a C-128 and 1571 disk drive. What else would I need?

—TOM CARVALHO  
SAN DIEGO, CA

**A** I'm partial to Steve Punter's *Punter BBS*, one of the first such boards available for Commodore owners and still one of the best known. The current version is 64.5. You can sample his product and arrange a purchase by calling Punter's own BBS in Mississauga, Ontario, Canada. The number I have for it is 416-624-5431.

As for a modem, the Commodore 1670 is probably an adequate and economical choice, although you may want



to get Punter's own advice on the best modem to use with his BBS program.

**Q** *I need a program that will list about 300 phonograph albums by 1) publisher, 2) album title, 3) song title, 4) composer, 5) orchestra and 6) conductor. Do you know of any software that can do this?*

—WADE JORDAN  
MACON, GA

**A** If you treat each song as a separate entry in a database program, almost any commercial data manager can handle the data, but you'd run out of storage on most Commodore disks long before you'd saved all of your data.

A better solution is to use a relational data manager, such as Precision Software's Superbase (sold by Progressive Peripherals, 464 Kalamath St., Denver, CO 80204). That way you can have an entry for each album in one data file, with a separate entry in a second related file for each song on the album. And the information shared by all the songs on an album is entered only once. (Depending on the number of songs per album, you may still need to use some abbreviations to get all your data on a 1541 data disk.)

**Q** *When I upgraded from a C-64 to a C-128, my troubles began. When I transferred database records, first to Consultant 128 and later to Superbase 128, the programs had great difficulty sorting my 3000 records. Progressive Peripherals told me the problem is in a 1571 disk chip and that they haven't been able to program around it. I contacted Commodore on QuantumLink and was told there is nothing wrong with the chip in the 1571. Repeated attempts to speak directly with someone at Commodore have failed.*

*Can you tell me anything about the 1571 chip?*

—ROBERT GELISKE  
PONTIAC, MI

**A** Since you encountered your sorting problem with two different top-flight programs, your problem is almost certainly due to a 1571 ROM bug. Since you are storing a relatively large amount of data, my guess is that the culprit is the bug a Commodore document dated last September described as follows: "With multiple files open and sectors being allocated on both sides [of the disk], the BAM swapper mechanism would trash BAM side one."

If not, perhaps it's due to one of the 13 other 1571 ROM bugs listed on the same page, or in the nine pages of other

C-128 problems described in the same document. That's the bad news. The good news is that, according to the same document, these faults were corrected in an unreleased set of four Version 3 ROMs. A 1571 upgrade ROM is available from some user groups and RUN advertisers.

### Education, Graphics, Entertainment

**Q** *I'm planning on taking a computer programming course that introduces the Pascal programming language, and I need to know what software company sells the best Pascal for the C-128.*

—JUAN PEREZ  
HIALEAH, FL

**A** The best Commodore-specific version I've tested on the C-128 is Super Pascal, from Abacus Software (PO Box 7219, Grand Rapids, MI 49510). It's also available for the C-64. Super Pascal includes both a text editor and compiler, and seems to have all the extras anyone could want.

However, Turbo Pascal, the compiler we use in our Pascal classes here at Western Illinois University, is supported by most new textbooks. It's from Borland International (4585 Scotts Valley Drive, Scotts Valley, CA 95056), and is available in a CP/M version that should be usable in CP/M mode on the C-128, and in an MS-DOS version for the PC-10.

**Q** *I have been searching diligently for a golf program. The only one I know of doesn't seem to take full advantage of the graphics capabilities of the C-64. Could you suggest some others?*

—DAVID SHARP  
ADDRESS UNKNOWN

**A** Friend Jim Oldfield has been searching for the ultimate computer golf game for years. His current favorite is Leader Board from Access Software. Others are also good, but he likes Leader Board because of the small hardware key (dongle) included with the game that allows him to make a backup copy for his own use.

You also might want to consider Electronic Arts' World Tour Golf.

**Q** *A few years ago I was introduced to Archon, an off-beat version of chess with a medieval setting. Since I'm getting a*

*C-128, I'd like to buy this game, but I can't remember who makes it.*

—BRIAN T. BURNS  
CORTLAND, NY

**A** Archon and Archon II are products of Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404) and should be available through most Commodore dealers.

**Q** *Does GEOS or Fontmaster for the C-128 offer a solution to the problem of writing math exams that include math symbols and diagrams?*

—PHILIP ROSEN  
NEW YORK, NY

**A** Jim Oldfield, having extensive experience using both geoWrite (from Berkeley Softworks) and Fontmaster II (from Xetec), reports that both are quite capable of integrating special math symbols into a document. Doing so will probably require fewer separate steps with Fontmaster II, but with GEOS you may also be able to make effective use of other related programs, such as geoPaint and geoPublish.

**Q** *The various ads I've seen for music software never indicate whether the programs can be used as background music in my own programs. Do you know of a music program that can do this?*

—E. H. MCCUAIG  
SAN MATEO, CA

**A** Master Composer, from Access Software, does what you ask. Once you enter this program, its songs compile into executable machine language programs that load and run separately from, but concurrently with, your programs via IRQ interrupts.

**Q** *Are there any C-64 programs for learning or playing bridge?*

—ALEX KAISER  
CATHEDRAL CITY, CA

**A** The shortage of bridge game programs is somewhat surprising, considering that Personal Software's version of bridge for the original Commodore PET was one of the first polished games offered for that machine. Unfortunately, Personal Software is long since gone, but Artworx Software (150 North Main St., Fairport, NY 14450) is still around and offers two newer programs for teaching and playing bridge. ▶



Bridge 4.0 is a well-regarded bridge simulation, in which you and a computer partner play against two computer opponents. It includes both bidding and actual play. The computer also keeps score.

Artworx' other bridge program, Compubridge, is a tutorial and quiz program to help improve your play. Both Bridge 4.0 and Compubridge are available from mail order dealers.

**Q** My copy of the F-15 flight simulator from MicroProse fails to load on my C-64. Instead, the program tells me I have "Hardware Failure." It does load properly on a friend's C-128, on a borrowed 1541 and on my 1541 with a repair shop's C-64. What do you think is the problem?

—JOHN GRAHAM  
MIAMI, FL

**A** A surprising number of software companies are unaware that there are several versions of the C-64 Kernal ROM in use, since Commodore doesn't publicize such information. My first guess is that your C-64 has an early Kernal ROM, and that incompatibility keeps your program from loading. If you update the chip, the problem should go away.

However, before you buy a new chip, try loading your flight simulator after disconnecting any unnecessary accessories from your system. I had a similar problem with Gunship, a MicroProse program that has captured my son's attention lately. When I unplugged my RS-232 interface, the program loaded.

**Utilities**

**Q** I have a C-64 and 1541 disk, and I'd like your opinion of the Epyx Fast Load cartridge. It appears to load and save programs five times faster or better. I've always believed you seldom get something for nothing, so is there a trade-off somewhere?

—JIM BODEAUX  
COVINGTON, LA

**A** Fast Load is a reputable product that for the most part does what it claims, and it's made a lot of friends by healing the 1541's debilitating case of slowness. The trade-off is incompatibility with a small number of copy-protected programs, which refuse to run with the cartridge installed. However, chances are you'll never encounter a program that won't work with Fast Load.

If you're mechanically inclined, you can solve this problem by adding an on/off switch to the cartridge. The switch should interrupt the EPROM line on the cartridge port when off. If you aren't mechanically inclined, just turn off your computer and unplug the cartridge when you want to run programs incompatible with Fast Load.

You should also deactivate Fast Load when you're using relative files, because readers have found it unreliable.

**Q** Is there a product with a push-button screen dump that prints out any screen from a C-128 and C-64?

—JOHN KIMBALL  
WASHINGTON, DC

**A** I haven't heard of one that will handle the C-128's 80-column screen yet, but if you can live with a C-64 mode dump, either of two products should work well for you. One is the Freeze Frame cartridge, now sold by Supra (1133 Commercial Way, Albany OR 97321) since its original maker, Cardco, folded. The other is The Final Cartridge, from H&P (154 Valley St., South Orange, NJ 07079). Since I don't like to constantly plug cartridges in and out, my own preference would be for The Final Cartridge, due to its many other features, including a program freezer, RAM dump, fast loader, machine language monitor, and more.

**Q** Can you recommend a program that makes double-sided, double-density disk backups on a C-128 in 128 mode with only a single 1571?

—JACK KARI  
WHITE PIGEON, MI

**A** One of the best programs for the purpose is free: Multi-file Copier by Kevin Pickell. It's widely available from user groups, on CompuServe or, if you can't find it locally, from the computer bulletin board system at 217-356-8056.

**PROGRAMMING**

**Basic**

**Q** What is Reverse Polish Logic?  
—KAM WONG  
EDMONTON, ALBERTA, CANADA

**A** There are three possible ways to write a mathematical expression;

1 + 2, the one all of us use every day, is one way. When the plus operator (+) is in its usual location between the two operands (1 and 2), that is known as infix notation.

A second way is Polish notation. In this form, the operator precedes the operands, and it's expressed as + 1 2. The advantage of this version is that it speeds the programs used to evaluate them, since the parentheses usually required to describe complex expressions are no longer needed.

The third way, known as Reverse Polish notation, places operands before the operator, expressed as 1 2 +. Hewlett-Packard calculators and the Forth programming language use Reverse Polish notation because expressions can be efficiently stored and retrieved with the stack operations included in the machine language instruction sets of nearly all microprocessors.

**Q** Is it possible to write a subroutine that allows the user to create Data statements that will be included in the listing after the program is run?

—WILLIAM WORD  
BELLWOOD, IL

**A** Yes, it's possible, and most user group libraries provide Data-maker programs to make Data statement values out of the contents of selected memory locations. This is useful in converting a machine language program into a form that's easier for nonprogrammers to enter.

However, apart from such specialized uses, what you propose is a self-modifying code, which is a nasty violation of good programming. It's also unnecessary. Rather than add Data statements to a listing, why not just open a file and dump your data into the file? That's what files are for, after all, and we'd all be better off if more programmers used them.

**Q** I have a couple of questions about using FRE(X) to find the space used in RAM. What's the formula for the C-64? Also, some programs show no space used. Don't machine language programs use up space in RAM?

—WALLACE EDSON  
LOMPOC, CA

**A** The FRE( ) function on the C-64 finds your remaining Basic work space by subtracting the current contents of a pointer to the start of the Basic program work space from those of a pointer to the end of the current



Basic program. The difference is the remaining number of free bytes, stored as a two-byte integer.

Since two-byte integer values greater than 32767 are interpreted as negative and there are initially 38911 Basic bytes free on the C-64, if you try ? FRE(0) immediately after switching on your computer, the machine will report -26627 bytes free. When you get a negative number of bytes free, ? 65536 + FRE(0) shows the correct answer.

If you give the latter command immediately after switching on, the response will be 38909, two bytes fewer than claimed by Commodore's sign-on message. The difference is due to two zero bytes that end each Basic program and are present even before a program is written or loaded. Commodore considers them initially free, but FRE(0) counts them as used.

As for machine language programs, they do use space in RAM, but unless they emulate Basic in the way they allocate that space, FRE(0) may not even know they are in memory. Then, too, some machine language programs use portions of memory unavailable to Basic, and don't reduce its work space.

**Q** Can you tell me how to put quotation marks within a Print statement on a C-64? I'm writing a story within a game, and it's difficult to read the text without them.

—MICHAEL HALL  
DESOTO, TX

**A** This is easier than you might expect. Simply replace the quotation marks with an equivalent character code, CHR\$(34).

Thus, if you wanted a character in your story to say: "Hold it thar," said Sam, your Print statement would read as follows:

```
1000 PRINT CHR$(34);"HOLD IT
      THAR,";CHR$(34);" SAID SAM."
```

Since Commodore Basic defaults to semicolon spacing, the semicolons between the parts of the statement are not strictly necessary, but should be left in for compatibility with other Basics.

One problem is that, once a quotation mark has been printed, the system will be in Quote mode until either a second quotation mark or a carriage return is printed. In Quote mode, cursor control characters don't move the cursor, but instead show up as reversed characters.

You can switch off Quote mode on the screen, but not on a printer, by printing two quotation marks in a row,

followed by a back-space character, entered as CHR\$(8). This erases the unwanted second quotation mark and exits Quote mode.

You can also use CHR\$( ) substitution to add other special characters, such as cursor controls to Print statements.

**Q** I'm running out of array memory on my C-128. Is there a way to use idle Basic program memory for arrays?

—JIM LYNCH  
ST. THOMAS, VI

**A** Yes, although it isn't very convenient and works best when all the data values in the array to be stored that way are small numbers or single characters, which allows each element to fit in a single byte of memory.

The basic idea is to directly poke the data into, and peek it back out of, unneeded space in the Basic program bank of memory. You'll need to find a safe starting address within the unused space and then locate each element in the poked array relative to that address. It's also up to you to make sure nothing tampers with that memory, since Basic offers very few safeguards when using Peek and Poke.

Before going to that extreme, I would also remind you of integer arrays. If a numeric array variable name ends with a percent sign (%), each of its elements take up three fewer bytes of memory than usual. The savings in a large array are sufficient to be worth a serious effort to limit data values to integers.

## Debugging

**Q** In some of my programs, I poke screen display codes into locations 1024-2023 of my C-64. This should print the character to the screen location I choose, but I can see the characters only when the cursor is flashing at the same location. How can I solve this problem?

—JOSHUA CARON  
QUIMBY, ME

**A** When you poke a character into screen memory, you're only half done. To see your results, you also need to poke a code for the color you want the character to be in color memory. Otherwise, you'll poke the character all right, but its default color will be the same as the background color, making it invisible until the background color changes by either a flashing cursor or an appropriate additional Poke. Color

memory on the C-64 begins at location 55296 and has one location for the color of each screen location, stored in the same order as character positions in the screen memory beginning at location 1024. You may poke any number in the range 0-15 into each color memory location, with each number representing one of the 16 available colors.

**Q** How do I get my MPS-1000 to print out the execution of a program? I can get a listing, but not a copy of the run.

—SHIRLEY GARDNER  
VERGENNES, VT

**A** For programs that get all data via Read or Input statements and display all results with Print statements, first use the following sequence of commands to generate a hard copy of the listing:

```
OPEN 4:4:CMD 4:LIST
```

Then adjust the paper to the top of the next page and begin the program run with:

```
GOTO 100
```

where 100 is the first line number in your program. (Use this instead of the Run command.) Now your program should execute normally, except that all output will be redirected to the printer instead of the screen.

When your program ends, you'll need to type one more line to print the last line of output and direct output back to the screen:

```
PRINT#4:CLOSE 4
```

One other caution. Since most printers buffer a full line of output before printing it, it's best to write your program with separate Print and Input statements rather than using the version of input that includes a prompting message. The problem with the latter form is that you can't read the question on the printer until after you've already answered it. Putting questions in separate Print statements avoids this.

## Disk & File Handling

**Q** In the directories of some commercial disks, I see the word DEL in the file-type column. Similarly, sometimes when I download a combined file from the local BBS and separate it afterwards with a program called Lynx, one program doesn't work, and when listed also has a DEL after its name in the directory.



*Does DEL there mean deleted? If so, why doesn't it just not show up in the directory at all? And if that's not it's meaning, what can I do to save such programs?*

—ALASTAIR BOR  
ANDOVER, MA

**A** The delete file type does indeed seem to stand for deleted. More specifically, it stands for a file that has been scratched, but not closed. It's definitely a file type to avoid, which is presumably the precise meaning you're intended to receive when looking at the directory of a copy-protected commercial disk.

Altering a directory entry so that it will show as a delete file is a simple matter of altering the file-type byte in the directory entry to the hex value \$80, using any of the readily available disk sector editors. However, if you change the file-type byte back to that of a normal file (for example, to \$82 for a program, \$81 for a sequential file), be aware that the associated file may still be incorrect—either intentionally as a part of a copy-protection scheme or accidentally as a result of an unsuccessful disk command.

The best thing to do with such files on a disk that's copy-protected is to leave them alone, so as not to disturb the already fragile functioning of such disks. If a delete file shows up on other disks, I'd consider that a good time to copy all the other files off it one at a time onto another disk for safe-keeping, then restore the deleted file on the new disk from the most recent backup. (You do make backups of your data disks, don't you?)

**Q** *What do the terms text file and binary file mean, and what is put on the disk for each?*

—TED CHIDESTER  
SANTA FE, NM

**A** An easy way to distinguish between text and binary files is that text files are made up of printable characters that people can read, whereas binary files are made up of binary codes that only computers can easily read.

The distinction is obvious in CPM mode on the C-128, and under MS-DOS on the PC-10 and PC-20, all of which have a type command to list the contents of a disk file. If it's a text file that ends with extensions such as .TXT, .ASM or .SRC, you'll be able to read its contents as it scrolls across your screen. On the other hand, if you try to type in a binary file, such as a machine lan-

guage program, you'll get only what appears to be garbage on the screen.

To a purist, a text file should be made up only of letters, numbers, punctuation and special symbols, and not include any control codes or graphics. A binary file, however, may include any character. If it's also a program file, its first two characters will also be the absolute address in memory into which the program should be loaded to run properly.

**Q** *How do I put more than one program on a disk? For instance, sometimes I type a program from RUN one month and want to save another program on the same disk the next month. How can I do this without erasing the first program?*

—S. GALATOWITSCH  
ST. PAUL, MN

**A** Unlike cassettes, which can easily erase an existing program when you save a new one on the same cassette, disks make it both easy to save a second program on the same disk and difficult to erase earlier programs without intending to.

Starting from a blank, formatted disk, you can save your first program with the command:

SAVE "0:NAMEONE",8

When you type in another program, save it with the command:

SAVE "0:NAMETWO",8

The only thing that changes is the program name, which must be different for each program on a disk. Even if you forget and attempt to reuse a name, the error light on the disk drive will begin flashing to tell you to try a different name.

**Q** *I haven't had any benefit from the programs published in RUN because I have a tape drive. Would you be kind enough to explain how to change Open statements so that I can use programs written for a disk.*

—JACK SCHULZ  
PORT HUENEME, CA

**A** The Open statement is very flexible and can usually be redirected from a disk to a tape with only a few changes, so long as the program you're altering uses only sequential files. Fortunately, most files are sequential.

Here are the typical changes needed, with explanations.

Disk sequential file Open to write data to drive 0 of disk unit 8:

OPEN 7,8,9,"0:KEEPIT,S,W"

The equivalent Tape File command is:

OPEN 7,1,1,"KEEPIT"

which likewise opens file 7 to write a file named "KEEPIT", but on the cassette.

The first 1 in the Tape command is the device number of the cassette, and replaces device number 8 in the Disk command. The second 1 in the Tape command indicates that the file is open for writing, and replaces the ,W at the end of the Disk command. There are no cassette parallels for the channel number 9 in the Disk command, nor for the ,S Disk Access mode, because the cassette has only one possibility for each.

The equivalent commands when re-opening an existing file to read back its data are:

OPEN 7,8,9,"0:KEEPIT,S,R"

and

OPEN 7,1,0,"KEEPIT"

Note that the only part that changes in either command is the Access mode: ,W became ,R on the disk, and the second 1 became a 0 on the cassette.

You'll also need to turn into a REM statement any lines that check for disk errors or give commands to the disk, but these are usually easily identified by their use of file 15. This is because the Disk-command channel is normally opened with the command: OPEN 15,8,15, causing all other disk commands and error checks to also use file 15, even though only the second 15 in the command is essential and the command file may occasionally use a different file number.

**Q** *How can I access a user file from a disk?*

—L. P. THOMASON  
JACKSONVILLE, FL

**A** To read a user file, just treat it as a sequential file, but replace the S for sequential in the File Open statement with a U for user. For example, to read a user file named Fido from drive 0 of device 8, you could use this Open command:

OPEN 1,8,3,"0:FIDO,U,R"

Once opened, user files can be read and written to in the same way as sequential files.

*Continued on p. 60.*



# Accomplish more . . . in less time with the power and versatility of the ReRUN Disk



## Useful Applications

- Word Processing
- Telecommunications
- Utilities
- Music
- Finance
- Databases
- Graphics
- Entertainment, and more . . .

All year long, ReRUN disks bring you pre-tested, high quality, ready-to-run programs for your business, home, and educational computing needs.

## Save Time

No need to spend your time entering lengthy program listings from the magazine. ReRUN disks are ready to load and run. No typing. No trouble.

Each bimonthly ReRUN disk offers popular programs from two issues of RUN magazine. Programs designed specifically for your Commodore 64 or 128.\*

## Added Bonus

Plus you get BONUS programs never before published . . . plus hints and tips from the popular Magic column . . . and a documentation booklet with each disk.

ReRUN saves you money and time by increasing your computing productivity. For example, in previous issues ReRUN has helped our subscribers . . .

- ✓ write more effective letters and reports with our efficient low-cost word processor
- ✓ enhance the image of business presentations with eye-catching graphics
- ✓ manage your expenses, keep track of accounts, calculate the future effects of your present financial moves

- ✓ break the memory barrier . . . create a RAM disk by using the RAM expansion module for your C-128
- ✓ create documents with double-sided pages and columns of text
- ✓ print banners, signs, and mailing labels
- ✓ help your kids with their math and spelling
- ✓ and enjoy our challenging, exciting ReRUN games.

You can order ReRUN disks individually at \$16.47 each, but for maximum savings sign up for one year and receive all six ReRUN disks and documentation booklets for only \$69.97. You save almost \$5 per disk!

To place your order immediately, call our 24-hour Toll-Free number

**1-800-258-5473**

(in NH, 1-924-9471).

\*Commodore 64 and 128 are registered trademarks of Commodore Business Machines, Inc.

**YES!** Help me put my Commodore to greater use. Send me a one year subscription to ReRUN (6 bimonthly disks and documentation booklets) for \$69.97.

Nov./Dec. '87 single issue for \$16.47 each  
\_\_\_\_\_ back issues at 16.47 each

month \_\_\_\_\_ year \_\_\_\_\_ month \_\_\_\_\_ year \_\_\_\_\_

Prices include postage and handling. Please allow 4-6 weeks for delivery. Foreign Airmail, please add US \$1.50 per disk and \$25 per subscription. US funds drawn on US banks only.

Payment Enclosed  
 MasterCard  American Express  VISA

www.commodore.ca  
May Not Reprint Without Permission

Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_



Signature \_\_\_\_\_  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Each ReRUN disk covers two issues of RUN magazine. Shipment occurs after the second issue is published. First available back issue is Jan/Feb. '86.

To place your order immediately call our 24-hour  
Toll-Free number **1-800-258-5473**  
(in NH 1-924-9471)

Mail to: ReRUN, 80 Elm Street, Peterborough, N.H. 03458

SP87





# S & S Wholesalers, Inc.

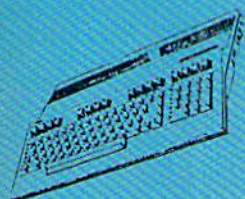
**FREE FREIGHT ON ORDERS OVER \$100.00.**

ALL PRICES REFLECT A 3% CASH DISCOUNT. ADD 3% FOR CREDIT CARD PURCHASES. COD ORDERS ADD \$4.00 PER BOX. ORDERS UNDER \$100.00 ADD \$4.95 SHIPPING AND HANDLING. QUANTITIES ON SOME ITEMS MAY BE LIMITED. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. APO, FPO ADD 6% ADDITIONAL SHIPPING. FOREIGN ORDERS ACTUAL FREIGHT CHARGED. ALL SALES ARE FINAL. RETURN OF DEFECTIVE MERCHANDISE FOR REPLACEMENT ONLY WITH AUTHORIZATION. AUTHORIZED RETURNS ARE SUBJECT TO A RESTOCKING FEE. COMPLETE LISTING OF ALL SALES POLICIES AVAILABLE UPON REQUEST.

\*EXCEPT ON ITEMS MARKED BY AN ASTERISK.

**CHRISTMAS HOURS: 8:00 AM - 9:00 PM EST**

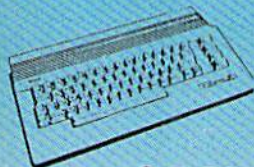
## COMMODORE 128



**189.90.**

\*WITH DISK DRIVE PURCHASE

## COMMODORE 64



**89.90.**

\*WITH PURCHASE OF SOFTWARE PACKAGE

## MP8803 PRINTER



**109.90.**

— QUANTITIES LIMITED —  
\*WITH 2 RIBBON PURCHASE

## PANASONIC 1080i

**139.90\***

WITH PURCHASE OF STARTER PACK

## C1750 EXPANDER

**159.90**

## 64 SOFTWARE

### ACCOLADE

ACE OF ACES	17.97
DAMBUSTERS	17.97
DECEPTOR	8.97
DESERT FOX	8.97
FIGHT NIGHT	17.97
FOURTH AND INCHES	17.97
HARDBALL	17.97
KILLED UNTIL DEAD	17.97
LAW OF THE WEST	17.97
SPY VS SPY I & II	8.97

### ACTIONSOFT

THUNDER CHOPPER	17.97
UKP PERRISCOPE	17.97

### ABACUS

ASSEMBLER MONITOR	23.97
BASIC COMPILER	23.97
CADPAK	23.97
CHARTPLOT	50.97
COBOL C64	23.97
DATAMAT	23.97
FORTH LANGUAGE	23.97
POWER PLAN C64	23.97
QUICKCOPY C64	11.97
SUPER C	35.97
SUKPER PASCAL	35.97
TAS C64	35.97
VIDEO BASIC	23.97
XPER EXPERT SYSTEM	35.97

### PROGRESSIVE PERIPHERALS

BOB TERM PRO	29.97
PICASSO'S REVENGE	35.97
SUPER SCRIPT	29.97
SUPERBASE '64	47.97
VISIWRITE	41.97

## ACCESS

EXECUTIVE DISK LEADER BD	11.97
LEADER BOARD	23.97
MACH 128	29.97
MACH 5	20.97
TOURNAMENT DISK LEADER BD	11.97
TRIPLE PACK	11.97
WORLD CLASS LEADER BD	23.97
WLD CL FAMOUS COURSES 1	11.97
10TH FRAME BOWLING	23.97

## ARTWORX

BRIDGE 4.0	14.97
COMPUBRIDGE	14.97
INTERNAT'L HOCKEY	14.97
PRO BOXING	8.97
STRIP POKER	17.97
STRIP POKER DISK 1 FEMALE	11.97
THAI BOXING	8.97

## ATARI\*

BATTLEZONE	8.97
CENTPEDE	8.97
DEFENDER	12.97
GALAXIAN	8.97
GREMLINS	8.97
JUNGLE HUNT	8.97
MOON PATROL	8.97
MS PAC MAN	8.97
PAC MAN	8.97
POLE POSITION	8.97
TRACK AND FIELD	8.97

## AVALON HILL

BLACK THUNDER	12.00
COMPUTER FOOTBALL STRAT	12.00
COMP STATIS PRO BASEBALL	21.00
DR. RUTH'S GAME/GOOD SEX	17.97
DREADNOUGHTS	18.00
GULF STRIKE	18.00
JUPITER MISSION 1999	21.00
LONDON BLITZ	15.00
MACBETH	15.00
MISSION ON THUNDERHEAD	15.00
PANZERS EAST	18.00
SPIRITRE 40	21.00
SUPER BOWL SUNDAY	21.00
TOURNAMENT GOLF	18.00

## BATTERIES INCLUDED

CONSULTANT	35.97
HOME PAK	9.97
PAPERCLIP	23.97
PAPERCLIP W/SPPELLPACK	37.97

## SOFTWARES

DESK PACK II	29.97
GEOCALC	29.97
GEOCHART	23.97
GEODEX	23.97
GEOFILE	29.97
GEO PUBLISH	29.97
GEOS	35.97
GEOS DEST PACK I	20.97

## COMMODORE

1571 DISK DRIVE	239.95
MPS 1200 PRINTER	229.95
C1902A MONITOR	279.95
128D COMPUTER	489.95
64C COMPUTER	179.95
1541 DISK DRIVE	109.95
C1700 EXPANDER	159.95
C1750 EXPANDER	39.95
C1660 MODEM	CALL
C1670 MODEM	CALL
C2002 MONITOR	329.95
C1581 DRIVE	239.95
C1351 MOUSE	34.95
DPM1101 DAISY WHEEL	249.95

## C64 WORD PROCESSING SYSTEM

C64 COMPUTER  
80 COLUMN PRINTER  
WORD PROCESSOR  
DATA BASE

**399.90**

— FREE SHIPPING —

## BETTERWORKING

BUSINESS FORM SHOP	23.97
FILE PRO	17.97
POWER ASSEMBLER	23.97
POWER C	23.97
PROGRAMMERS TOOL BOX	11.97
SPREADSHEET	14.97
TURBO-LOAD TURBO-SAVE	14.97
WORD PRO	23.97
WORD PROC W/SPELL CHECK	17.97

## BRODERBUND

BANK STREET WRITER	29.97
BANK STREET SPELLER	29.97
BANK STREET FILER	29.97
BANK STREET MAILER	29.97
CHAMP LODGE RUNNER	20.97
HOLIDAY PRINT SHOP GRAPH	14.97
KARATEKA	17.97
PRINT SHOP	26.97
PRINT SHOP COMPANION	20.97
PRINT SHOP GRAPHICS LIB 1	14.97
PRINT SHOP GRAPHICS LIB 2	14.97
PRINT SHOP GRAPHICS LIB 3	14.97
TYPE	23.97
WHERE IN THE USA IS CARMEN	26.97
WHERE IN WORLD IS CARMEN	20.97

## EDUWARE

ALGEBRA VOLUME I	17.97
ALGEBRA VOLUME II	17.97
ALGEBRA VOLUME III	17.97
EDUWARE BUNDLE	53.97
SPELLING AND READING	17.97
WEBSTER'S NUMBERS	17.97

## EPYX

CHAMPIONSHIP WRESTLING	23.97
CREATE A CALENDAR	17.97
DESTROYER	23.97
GRAPHICS SCRAPBK SPORTS	14.97
GRAPHICS SCRAPBK OFF WALL	14.97
GRAPHICS SCRAPBK SCHOOL	14.97
JET COMBAT SIMULATOR	11.97
MICROSOFT MULTIPLAN	23.97
PROGRAMS BASIC TOOLKIT	11.97
STREET SPORTS/BASEBALL	23.97
STREET SPORTS/BASKETBALL	23.97
SUB BATTLE	23.97
SUMMER GAMES II	23.97
VORPAL UTILITY KIT	11.97
WINTER GAMES	23.97
WORLD GAMES	23.97
WORLD KARATE CHAMP	17.97
CALIFORNIA GAMES	23.97

## FIREBIRD

COLOSSUS CHESS IV	20.97
ELITE	19.97
GUILD OF THIEVES	26.97
PAWN	26.97
STARGLIDER	23.97

## GAMESTAR

CHAMP BASEBALL	17.97
GBA CHAMP BASKETBALL	20.97
GFL CHAMP FOOTBALL	20.97
ON FIELD FOOTBALL	17.97
ON TRACK RACING	14.97
STAR LEAGUE BASEBALL	17.97
STAR RANK BOXING	17.97

## HAYDEN

MICRO ADDITION	7.77
SARGON III	14.77

## HITECH EXPRESSIONS

CARDWARE	6.77
CHRISTMAS JINGLE DISK	6.77
HEART WARE	6.77
PARTYWARE	9.77

## INFOCOM

DEADLINE	6.77
LEATHER GODDESES/PHOBOS	20.97
STARCROSS	6.77
SUSPENDED	6.77
ZORK I	6.77
ZORK II	6.77
ZORK III	6.77
ZORK TRILOGY	14.77

## DAVIDSON

ALGE-BLASTER	29.97
MATH BLASTER	29.97
SPELL III	29.97
WORD ATTACK	29.97



## ELECTRONIC ARTS

ADVENTURE CONST. SET	24.97
AMNESIA	24.97
ARCTIC FOX	20.97
AUTODUEL	30.97
BARO'S TALE	24.97
BARO'S TALE II	24.97
CHESSMASTER 2000	24.97
FINANCIAL COOKBOOK	9.00
HARD HAT MACK	6.00
LEGACY OF THE ANCIENTS	18.97
M.U.I.L.E.	9.00
MAIL ORDER MONSTERS	9.00
MARBLE MADNESS	18.97
MOVIE MAKER	9.00
MUSIC CONST. SET	4.00
OGRE	24.97
PEGASUS	18.97
PINBALL CONST. SET	9.00
RACING DESTRUCTION SFT	9.00



# 1-800-233-6345

# 1-800-331-7054

## PANASONIC

1080i CALL 199.90  
1091i 349.90  
1092i 329.90  
KXP3131 DAISY WHEEL 249.90  
1524 24 PIN HEAD CALL  
LASER PRINTER 1499.90

## EPSON

LX800 169.90  
FX86E 349.90  
FX286E 449.90  
EX800 CALL  
EX1000 CALL  
LQ800 589.90  
LQ1000 CALL  
LQ2500 899.90

## CG4 SYSTEM

C64 COMPUTER  
1541 COMPATIBLE DRIVE  
CITIZEN 40 COLUMN PRINTER  
JOYSTICK

**399.90**

— FREE SHIPPING —

## AMIGA

AUTHORIZED AMIGA DEALER  
COMPLETE AMIGA LINES IN STOCK  
CALL FOR BEST PRICES

C128 SUPER WORD  
PROCESSING SYSTEM

C128 COMPUTER  
C1571 DISK DRIVE  
C1902A MONITOR  
MPS 1200 PRINTER  
WORD PROCESSING  
WITH WORD CHECKER

**FREE SHIPPING 999.90**

## AMERICAN COVERS

C128 COVERS 7.77  
C64 COVERS 6.77  
1571 COVERS 7.77  
C1902 COVERS 14.77  
MPS803 COVERS 7.77  
MPS1200 9.77  
MPA1000 9.77  
VIC1525 9.77  
AMIGA SYSTEM 29.90  
A1080 COVER 14.77  
AMIGA DRIVE 9.77  
C1802 COVER 14.77  
C1702 COVER 14.77  
OKIMATE 9.77  
SEIKOSHA 9.77  
IPSON 9.77  
EPSON 15" 12.77

OTHERS AVAILABLE  
CALL FOR PRICING

## RADAR DETECTOR

SUPERHETRODYNE

**69.90**

## PROFESSIONAL SOFTWARE

FLEET FILER 23.97  
FLEET SYSTEM 2 35.97

## STRATEGIC SIMULATIONS

FORTRESS 8.97  
GEMSTONE WARRIOR 8.97  
GERMANY 1985 8.97  
GETTYSBURG 35.97  
KAMPFGRUPPE 35.97  
NORWAY 1985 20.97  
PANZER GRENADIER 23.97  
PHANTASIE II 23.97  
PRESIDENT ELECT '88 14.97  
REBEL CHG. CHICKAMAUGA 29.97  
ROADWAR 2000 23.97  
SIX GUN SHOOTOUT 23.97  
USAAF 35.97  
WAR IN THE SO. PACIFIC 35.97  
WARGAME CONST. SET 17.97  
WARSHIP 35.97

## MASTERTRONIC

ACTION BIKER 4.77  
BMX RACERS 4.77  
CHILLER 4.77  
ELEKTRA GUIDE 4.77  
FINDERS KEEPERS 4.77  
FIVE A SIDE SOCCER 4.77  
GAIES OF DAWN 4.77  
HERO OF GOLDEN TALISMAN 4.77  
INSTANT RECALL 4.77  
KIKSTART 4.77  
LAST V8 4.77  
MASTER MAGIC 4.77  
NINJA 4.77  
PRO-GOLF 4.77  
SEKAA OF ASSIAH 4.77  
SLUGGER 4.77  
SPACEHUNTER 4.77  
SPEED KING 4.77  
SPOOKS 4.77  
VEGAS POKER AND JACKPOT 4.77  
ZZZ 4.77

## MICROPROSE

ACROJET 14.97  
CONFLICT IN VIETNAM 23.97  
F-15 STRIKE EAGLE 20.97  
GUNSHIP 20.97  
SOLARLIGHT 14.97  
PIRATES! 23.97  
SILENT SERVICE 20.97  
TOP GUNNER SERIES 14.97

## MICRO LEAGUE

MICROLEAGUE BASEBALL 23.97  
WWF MICROLEAG WRESTLING 23.97  
1986 TEAMS DISK 11.97  
50's WORLD SERIES 11.97  
60's WORLD SERIES 11.97  
70's WORLD SERIES 11.97

## PEACHTREE

BACK TO BASIC ACCNTING 117.00

## THUNDER MOUNTAIN

ABC'S W/ THE TINK TONKS 5.97  
CYRUSS CHESS 5.97  
DEMOLITION MISSION 5.97  
ELIMINATOR 5.97  
MAXI GOLF 5.97  
MR. PIXEL'S CARTOON KIT 5.97  
NUMBER BOWLING 5.97  
RAMBO FIRST BLOOD PT. II 5.97  
SONGWRITER 5.97  
SUBTRACTION W/TINK TONKS 5.97  
TOP GUN 5.97

## TIMEWORKS

DATA MANAGER 2 23.97  
PARTNER 35.97  
SWIFCASC W/SIDEWAYS 23.97  
WORD WRITER 3 29.97

## UNISON WORLD INC.

ART GALLERY I 14.97  
ART GALLERY II 14.97  
PRINT MASTER PLUS 20.97

## SPRINGBOARD

CERTIFICATE MAKER 29.97  
CERT. MAKER LIBRARY 1 20.97  
CLIP ART VOL 1 17.97  
CLIP ART VOL 2 23.97  
CLIP ART VOL 3 17.97  
EARLY GAMES FOR CHILDREN 20.97  
GRAPHICS EXPANDER 20.97  
NEWSROOM 29.97

## SUBLOGIC

BASEBALL 32.97  
BASEBALL STADIUM DISK 12.97  
FLIGHT SIMULATOR II 32.97  
FOOTBALL 25.97  
JET 25.97  
NIGHT MISSION PINBALL 19.97  
SCENERY DISK 1 TEXAS 12.97  
SCENERY DISK 2 ARIZONA 12.97  
SCENERY DISK 3 CALIF. NEV. 12.97  
SCENERY DISK 4 WASHINGTON 12.97  
SCENERY DISK 5 UTAH, CO. WY 12.97  
SCENERY DISK 6 KANSAS, NEB. 12.97  
SCENERY DISK 7 FL. NC. SC 12.97  
SCENERY DISK 9 IL. MO. OH 12.97  
STAR SCENERY-SAN FRAN 12.97  
STAR SCENERY-JAPAN 12.97  
WESTERN SCENERY DISK PACK 64.97

## MINDSCAPE

BOPN WRESTLE 17.97  
DEFENDER OF THE CROWN 20.97  
FIST 17.97  
HIGH ROLLER 17.97  
INFILTRATOR 17.97  
MASTERTYPE 11.97

## DIGITAL SOLUTIONS

POCKET DICTIONARY 8.97  
POCKET FILER II 35.97  
POCKET PLANNER II 35.97  
POCKET WRITER II 35.97

## 128 SOFTWARE

### ABACUS

BASIC COMPILER 35.97  
CADPAK 35.97  
CHARIPAK 23.97  
COBOL 35.97  
PERSONAL PORTFOLIO MGR 35.97  
SPEEDTERM 23.97  
SUPER C 35.97  
SUPER PASCAL 35.97  
TAS 35.97  
XREF 10.77

### ACCESS

MACH 128 29.97

### BATTERIES INCLUDED

PAPERCLIP II 47.97

### DIGITAL SOLUTIONS

POCKET DICTIONARY 8.97  
POCKET FILER 30.97  
POCKET FILER II 35.97  
POCKET PLANNER II 35.97  
POCKET WRITER II 35.97  
SUPERPACK II 59.97

### PROGRESSIVE PERIPHERALS

BOB TERM PRO 47.97  
SUPER SCRIPT 47.97  
SUPERBASE 128 59.97  
VISISTAR 128K 71.97

### PROFESSIONAL SOFTWARE

FLEET SYSTEM 3 41.97  
FLEET SYSTEM 4 47.97

### TIMEWORKS

DATA MANAGER 128 34.77  
PARTNER 34.77  
SWIFCASC 128 34.77  
SYLVIA PORTER 128 34.77  
WORD WRITER 128 34.77

### XETEC

FONTMASTER 128 35.97

## DIABLO 630

400CPS PRINTER

**799.90**  
**AMIGA**

CALL FOR  
BEST PRICING

## STAR NXIOC 199.90

## OKIMATE COLOR PRINTER

**99.90**

\*WITH PURCHASE OF  
PLUG-N-PRINT

## PC10-1

**489.90**

\*WITH MONITOR PURCHASE

## CG4 POWER SUPPLY

**28.90**

— FREIGHT FREE —

## SIX OUTLET SURGE PROTECTOR

**19.90**

## WICO

BOSS 11.77  
BAT 14.77  
BLACKMAX 8.77  
THREE WAY 19.77

## C1670 MODEM



**129.90**

\*WITH PURCHASE OF SOFTWARE

## COLOR MONITOR



**149.90**

— QUANTITIES LIMITED —  
\*WITH PURCHASE OF  
MONITOR CABLE



# Magic

*RUN's Magic column of computing tricks sent in by readers  
is one of the most popular features of the magazine.*

*In this Special Issue, we're once again including a selection of the best  
tricks from the past year. Whether a Commodore novice or expert,  
hardware hacker or software aficionado, you're sure to find  
among these tricks some miniprograms, shortcuts and hints that  
will delight you and make your computing easier.*

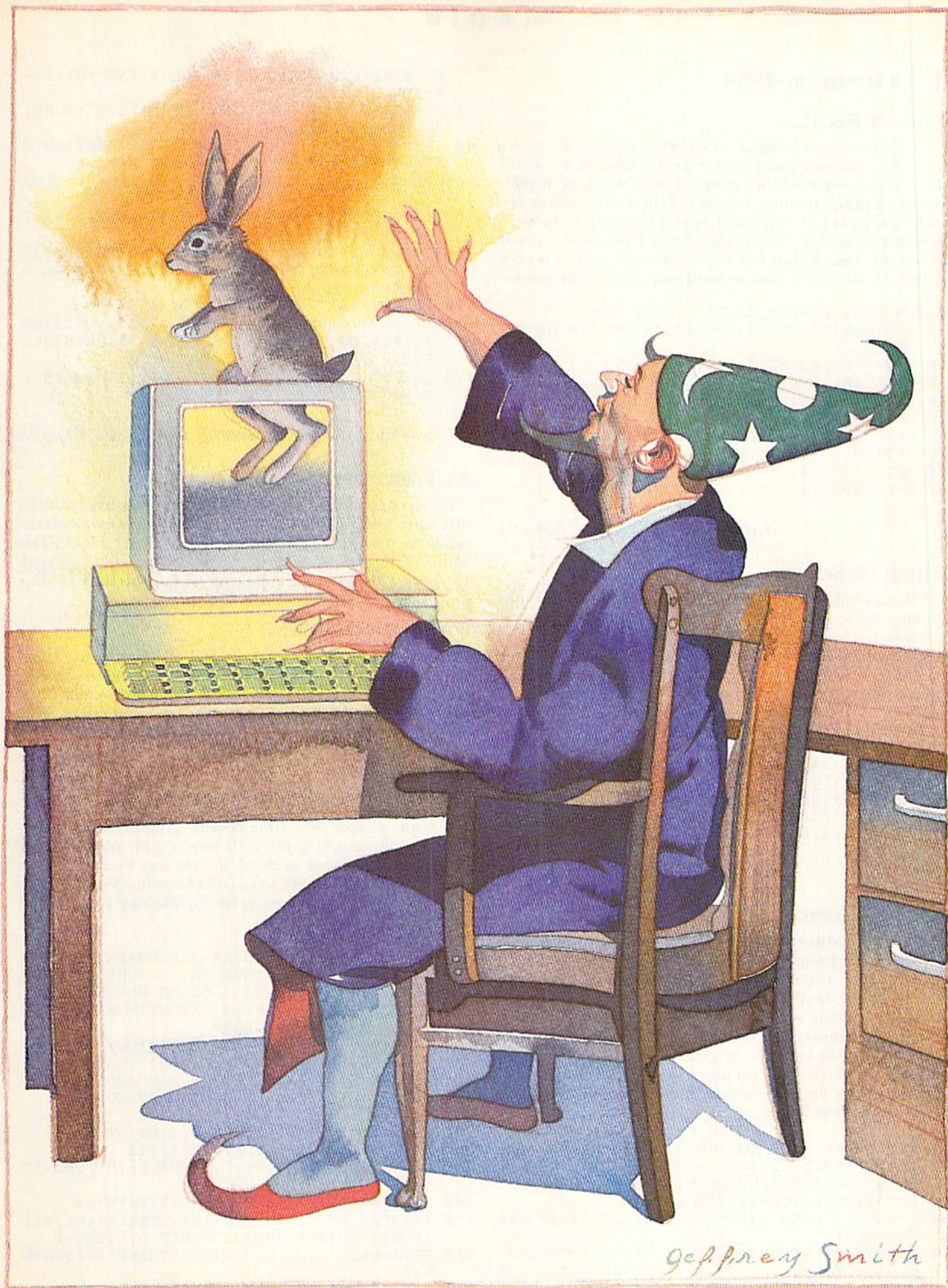
---

1. COMPUTERS—C-64 .....	38
2. COMPUTERS—C-128 .....	45
3. DISK OPERATION/RECORDING .....	70
4. PRINTERS/PRINTER OPERATION .....	74
5. VIDEO/AUDIO DEVICES .....	75
6. ENTERING/EDITING PROGRAMS .....	76
7. LANGUAGES—BASIC .....	77
8. LANGUAGES—ML .....	78
9. GEOS .....	80
10. PROGRAMMING TIPS—GENERAL .....	80
11. PROGRAMMING TIPS—MATH/EDUCATION .....	81
12. PROGRAMMING TIPS—SCREEN DISPLAY .....	84
13. PROGRAMMING TIPS—SOUND .....	87
14. PROGRAMS—AMUSEMENTS/DELIGHTS .....	88
15. PROGRAMS—COMMERCIAL SOFTWARE .....	89
16. PROGRAMS—USEFUL APPLICATIONS .....	92
17. PROGRAMS—UTILITIES .....	93
18. WORD PROCESSORS .....	95
19. SEASONAL .....	95
20. MISCELLANEOUS .....	96

---

**By JIM BORDEN**





*Geoffrey Smith*



## 1. COMPUTERS—C-64

### INSTANT RECALL

The Screen Save program listed below is useful for saving lo-res text screens (such as a note to yourself or a disk directory) to the C-64's memory for later recall, even while you're running another program. Type in the listing and make a copy before you run it. Save a screen to memory by entering SYS49152. Recall the screen from memory with SYS49184. Your screen will stay in memory until it is overwritten by another screen or until you turn off the power.

```
0 REM C-64 SCREEN SAVER - CHAD AMES
10 FOR I=49152 TO 49215:READA:POKEI,A:NEXT:N
  EW
20 DATA 169,0,162,0,189,0,4,157
30 DATA 80,195,189,255,4,157,79,196
40 DATA 189,254,5,157,78,197,189,253
50 DATA 6,157,77,198,232,208,229,96
60 DATA 169,0,162,0,189,80,195,157
70 DATA 0,4,189,79,196,157,255,4
80 DATA 189,78,197,157,254,5,189,77
90 DATA 198,157,253,6,232,208,229,96
```

—CHAD AMES, ESSEX JUNCTION, VT

### THINKING SOUNDS

You can enhance your games and other interactive programs with sound effects. My C-64 Thinking program will give you the impression that your computer is mulling over a strategic move or working with a command you've just entered. Try it also in a program as a subroutine immediately before output to the screen or following user input.

```
490 REM C-64 THINKING - JOSEPH CHARNETSKI
500 S=54272:POKE S+6,240:POKE S+5,34
510 POKE S+24,15:POKE S+4,21
520 FOR I=1TO30
530 POKES+1,RND(1)*180:POKE S,RND(1)*20
540 FOR J=1TO60:NEXT:NEXT
550 POKE S+4,0:REM RETURN
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### ML FILE COPIER

Copying machine language files is a bit more difficult than copying Basic programs: They must be loaded with the ,8,1 or ,1,1 syntax. The utility I've developed transfers most ML files from disk to disk (or tape) without having to know the starting or ending addresses. Program operation is straightforward; just answer the prompts. The source is the medium from which you load the original, and destination is the medium on which you want the copy saved. In addition, the utility displays the starting and ending address of the ML file being copied.

```
10 REM 64 ML FILE COPIER-RICHARD PENN
20 PRINT"{SHFT CLR}{CRSR DN}{CTRL 9}INSERT
  SOURCE DISK/TAPE AND HIT RETURN"
30 GETA$:IFA$<>CHR$(13)GOTO30
40 INPUT"{2 CRSR DNs}ML FILENAME";F$:IF F$=
  ""GOTO40
50 INPUT"{CRSR DN}SOURCE:{6 SPACES}{CTRL 9}
  T{CTRL 0}APE OR {CTRL 9}D{CTRL 0}ISK";D$
  :SD=8:IFD$="T"THENS D=1
60 INPUT"{CRSR DN}DESTINATION:{CTRL 9}T{CT
```

```
RL 0}APE OR {CTRL 9}D{CTRL 0}ISK";D$:DD=
  8:IFD$="T"THENDD=1
70 PRINT"{2 CRSR DNs}LOADING "F$"...":POKE1
  47,0:SYS57812F$,SD,1:SYS62631
80 IFSD=1THENSL=PEEK(829):SH=PEEK(830):GOTO
  100:REM TAPE
90 OPEN2,8,2,F$:GET#2,A$,B$:Z$=CHR$(0):CLOS
  E2:SL=ASC(A$+Z$):SH=ASC(B$+Z$)
100 PRINT"{CRSR DN}"SL+256*SH"-PEEK(174)+2
  56*PEEK(175)
110 PRINT"{2 CRSR DNs}{CTRL 9}INSERT DESTIN
  ATION DISK/TAPE AND HIT"SPC(14)"{CTRL 9
  }RETURN TO COPY"
120 GETA$:IFA$<>CHR$(13)GOTO120
130 PRINT"{2 CRSR DNs}COPYING "F$"...":SYS5
  7812F$,DD,1:POKE193,SL:POKE194,SH:SYS62
  957
140 INPUT"{2 CRSR DNs}DONE. COPY IT AGAIN (
  Y/N)";A$:IFA$="Y"GOTO100
```

—RICHARD PENN, MONTREAL, QUEBEC, CANADA

### AT FIRST SPRITE

If you use sprites in your programs, you may have noticed that when you first display a sprite, it flashes momentarily below the position you have set and then corrects itself. This happens once to each sprite when it's initially displayed. To prevent this, use the following line at the start of your program:

```
10 POKE 53269,255:POKE 53269,0
```

This turns all eight sprites on and off, forcing the video chip to complete its initialization. Since the position registers point off screen initially, there is no visible effect, but when you're ready to display a sprite, it appears in the right place immediately.

—LOU GOLDSTEIN, FLUSHING, NY

### SCREEN MAPPER

If your printer uses Commodore graphics, this menu-driven program will print both screen and color memory maps with numbered grids of 40 columns by 25 rows for screen locations 1024–2023 and color locations 55296–56295. It also prints screen layout grids for plotting column and row coordinates.

```
10 REM SCREEN MAP PRINTER-J.R.CHARNETSKI
20 PRINT"{SHFT CLR}{CRSR DN} 1-SCREEN MEMOR
  Y{HOME}{2 CRSR DNs} 2-COLOR MEMORY{HOME}
  {3 CRSR DNs} 3-SCREEN LAYOUT{HOME}{4 CRS
  R DNs} 4-END{CRSR DN}"
30 GETA$:A=VAL(A$):ON-(A<1ORA>4)GOTO30:ONAG
  OTO40,50,60:PRINT"{SHFT CLR}":END
40 X=1024:T$="SCREEN MEMORY MAP":GOTO70
50 X=55296:T$="COLOR MEMORY MAP":GOTO70
60 X=0:T$="SCREEN LAYOUT"
70 PRINTA:M=25:S$=" ":OPEN4,4:PRINT#4
80 PRINT#4,SPC(39-(LEN(T$)/2));T$
90 PRINT#4,SPC(19);B$="{4 SPACES}":FORJ=1T
  O4
100 PRINT#4,"0123456789";:NEXT:PRINT#4
110 PRINT#4,SPC(13)RIGHT$(B$+STR$(X)+S$,6);
  :FORI=1TO40:PRINT#4,"{SHFT O}";:NEXT
120 PRINT#4,"{COMD G}";:IFX<MTHENX=X+1:GOTO
  140
130 X=X+40:PRINT#4,MID$(STR$(X-1),2);
140 PRINT#4,CHR$(8):C=C+1
```



```
150 PRINT#4,CHR$(15);:IFC<MGOTO110
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

## SAVING YOUR CUSTOMIZED RUN SCRIPT 64

I've enjoyed using RUN Script 64, and I've used the Params program (see "RUN Script 64," April 1986) with it many times. It's a little inconvenient, though, because it won't save the modified RUN Script file onto the same disk. Since the old version needs to be scratched before saving the new version, I added the following line:

```
895 OPEN15,8,15,"S0:RUNSCRIPT":CLOSE15
```

Now the Parameters program scratches the old file before saving the new version. Be sure to follow the instructions for the Params program. Now making changes is much easier!

—JAMES HALLMAN, OWENSBORO, KY

## SYS A BORDER

Creating screen borders with the Print command can be quite a chore. Here's a machine language alternative. This routine can be appended to your program to create borders with your own character and color. The ML program that SYS a Border creates is relocatable and may be loaded wherever you have 100 bytes of free memory. Please note that locations 251 through 254 are used during the execution of the ML program.

The syntax for using SYS a Border is SYS address, screen code #, color code #. The demo at the end of the Basic loader shows how to create a border with the asterisk in the current cursor color.

```
1 REM 64 SYS A BORDER-FRANK COLARICCI
2 REM RELOCATABLE-JUST CHANGE 'BR'
3 BR=49152:REM SYS ADDRESS
4 FOR X=BR TO BR+99:READ A:POKE X,A
5 T=T+A:NEXT:IFT<>14085 THEN(2 SPACES)STOP
6 DATA 032,253,174,032,158,173,032,247
7 DATA 183,140,000,004,032,253,174,032
8 DATA 158,173,032,247,183,140,000,216
9 DATA 162,039,173,000,004,157,000,004
10 DATA 157,192,007,173,000,216,157,000
11 DATA 216,157,192,219,202,016,235,169
12 DATA 039,133,251,133,253,169,004,133
13 DATA 252,169,216,133,254,162,024,173
14 DATA 000,004,160,000,145,251,200,145
15 DATA 251,173,000,216,145,253,136,145
16 DATA 253,165,251,024,105,040,144,004
17 DATA 230,252,230,254,133,251,133,253
18 DATA 202,208,220,096
190 PRINT"{SHIFT CLR}{3 CRSR DNs}SAMPLE"
110 SYS BR,42,PEEK(646)
```

—FRANK COLARICCI, WINTER PARK, FL

## DISK VERIFY TIP

After saving a program to disk, I always verify it with VERIFY "\*"8 to save time. This works because \* accesses the last file saved or loaded. (The exception is when you initially turn on the drive; it refers only to the first file on the disk.)

—HAL VAUGHN, MOUNT AIRY, NC

## INPUT PROMPT

Sometimes the standard input prompt can get in the way of elegant programming. For instance, when writing a financial program, you may want the question mark replaced with a dollar sign. My short routine rewrites Basic into RAM to let you do just that. Insert the data loader at the beginning of your program and activate the machine language routine with SYS49152. A dollar sign will appear whenever the Input statement is called.

You can restore the question mark at any time, or you can use any other character you want. Just poke the selected character code into location 43846. If you prefer that no character appear, try using a 32 (the space character) as the prompt character.

```
30 REM DOLLAR INPUT-KENT BRIDWELL
40 CK=0:FORI=49152 TO 49223:READ A
50 CK=CK+A:POKE I,A:NEXT
60 IFCK<>11068THENPRINT"DATA ERROR!":END
70 SYS49152:REM >>TEST PROMPT NOW
80 PRINT:INPUT"ENTER PRICE: ";D
90 PRINT:PRINT"PRICE IS $"D
100 DATA 169,000,133,251,133,253,169,160
110 DATA 133,252,133,254,169,255,141,072
120 DATA 192,169,191,141,073,192,160,000
130 DATA 177,251,145,253,230,251,208,002
140 DATA 230,252,165,251,205,072,192,208
150 DATA 010,165,252,205,073,192,208,003
160 DATA 076,060,192,230,253,208,002,230
170 DATA 254,076,022,192,169,036,141,070
180 DATA 171,165,001,041,254,133,001,096
```

—KENT M. BRIDWELL, SANTA MONICA, CA

## FASTEST DATAFILE 64

Since I've discovered the usefulness of Datafile and its peripheral programs (*RUN*, November and December 1984), I've gradually increased the number of applications. One of my databases contains 438 records, and sorting it before printing it out used to take 426 seconds. I found that if I compiled Datafile with a compiler such as Blitz!, the same sort took only 90 seconds!

Searches and file loads also execute faster. A typical 500-record search was cut from 18 seconds to 6 seconds, while loading the file was reduced from 120 seconds to about 80 seconds.

The beauty of Datafile is that it can be loaded and put into use before most commercial database programs get their first screen. Compiling it makes it even more beautiful!

—PHIL HYSELL, LOUISVILLE, KY

## GREAT ESCAPE

Have you ever been trapped in an input on your C-64, only to be forced to exit using the return key? Well, here's a better exit. Simply hold down the shift key, press the run-stop key and then quickly release the shift key. This is done with a sort of rolling motion. One word of caution: If you use a Datassette, make sure none of its buttons are depressed; otherwise, it could cause a program to begin loading from the Datassette and ruin the program currently in memory.

—DAVID HINK, NANTY GLO, PA

## LETTER CATCHER

This game can sharpen your reflexes and typing skills, and you can have fun at the same time. ►



## MAGIC

When you run the program, a randomly chosen letter appears at the bottom of the screen and moves slowly upward. If you press the corresponding key before the letter reaches the top, a point is added to your score and a new letter is chosen. The quicker your fingers fly, the more points you can get. The program increases speed a little after each letter. If you touch-type, you'll learn to type faster.

```
10 REM LETTER CATCHER - CHING KO
20 DT=100:S=0:CH=RND(-TI)
30 PRINTCHR$(147):CH=INT(RND(1)*26)+65
40 FORDE=1TO23:PRINT:NEXT
50 PRINT:PRINTTAB(INT(RND(1)*37)+2)CHR$(CH)
  ;:I=24
60 GETK$:IFK$<>CHR$(CH)GOTO90
70 PRINT CHR$(147):S=S+1:PRINTTAB(18);S
80 DT=DT-1:FORDE=1TO250:NEXT:GOTO30
90 FORDE=1TODT:NEXT
100 PRINT:IFI>0THENI=I-1:GOTO60
110 PRINTCHR$(147)"YOUR SCORE WAS";S:PRINT
120 PRINT"PRESS 'RETURN' TO PLAY AGAIN."
130 INPUT K$:IFK$=""GOTO20
```

—CHING KO, MCPHERSON, KS

### C-64 TRACE

Debugging a Basic program is made easier with a trace utility. These utilities trace the execution of a program and display the line numbers. Most traces display the lines on the screen while the program is running. This can cause problems if your program prints to the screen, resulting in scrambled displays. Also, when listing a program to compare it with the trace, you can accidentally scroll the trace values right off the screen.

To overcome these annoyances, C-64 Trace stores all executed lines in memory (up to 2000 of them) while your program is running, and it allows the numbers to be recalled later as often as you wish. To use C-64 Trace, type SYS820 to turn it on, and then run your program. (Turning on the trace clears all previously saved line numbers.)

To display the executed lines and shut off the trace, type SYS916. The line list can be stopped at any time with the run-stop key. Also, if there's a For-Next loop on a line, rather than display the same line many times, C-64 Trace does it just once. Lines containing only REMs are also ignored.

```
1 REM C-64 TRACE UTILITY-RICHARD PENN
10 FORU=820TO990:READQ:POKEU,Q:C=C+Q:NEXT
15 IFC<>21791THENPRINT"DATA ENTRY ERROR!":S
  TOP
20 PRINT"{SHFT CLR}SYS820 - TRACE ON":PRINT
  "SYS916 - DISPLAY LINES":POKE179,4
100 DATA 169,77,141,10,3,169,3,141,11,3,169
  ,0,133,251,141,146,3,141,147
110 DATA 3,169,192,133,252,96,72,138,72,152
  ,72,8,165,157,201,0,208,36,160
120 DATA 0,165,57,166,58,205,146,3,208,8,23
  6,147,3,208,3,76,125,3,141
130 DATA 146,3,145,251,32,134,3,142,147,3,1
  38,145,251,32,134,3,40,104,168
140 DATA 104,170,104,76,134,174,230,251,165
  ,251,201,0,240,1,96,230,252,96,4
150 DATA 0,169,0,133,253,169,192,133,254,16
  0,0,165,253,197,251,208,6,165,254
160 DATA 197,252,240,30,169,13,32,210,255,1
  77,253,170,32,211,3,177,253,32,205
170 DATA 189,32,211,3,32,234,255,32,225,255
  ,240,3,76,156,3,169,134,141,10
```

```
180 DATA 3,169,174,141,11,3,96,230,253,165,
  253,201,0,240,1,96,230,254,96
```

—RICHARD PENN, MONTREAL, QUEBEC, CANADA

### AUTO MENU BOOTER

The Auto Menu program in the April 1986 issue of *RUN* is really great, and I use it on all my disks. However, if each program on the disk has the following lines as an Exit routine, the Auto Menu program can be loaded automatically and run.

```
10 REM AUTO MENU BOOTER-THOMAS W. O'DEA
62500 INPUT"DO YOU WANT TO RUN THE PROGRAM
  AGAIN{4 SPACES}(Y/N){2 SPACES}Y{3 CRS
  R LFS}";R$
62510 IF R$="Y"THEN RUN
62520 IFR$<>"N"THENPRINT"{3 CRSR UPS}":GOTO
  62500
62530 POKE53281,1:POKE646,0
62540 PRINT"{SHFT CLR}{11 CRSR DNS}"SPC(13)
  "LOADING MENU"SPC(108)"PLEASE WAIT..."
62550 PRINT"LOAD"CHR$(34)"AUTO MENU"CHR$(34)
  ",8"
62560 PRINT"{4 CRSR UPS}":POKE631,131:POKE1
  98,1:END
```

—THOMAS W. O'DEA, RANDOLPH, MA

### BLOCKS FREE

If you'd like to know how many blocks remain free on a disk without listing the entire directory, simply enter LOAD"\$\$.8. Then list the "program." The result will display the blocks free on the disk but not the directory. You'll have to load a program (or a complete directory) before trying this trick again, otherwise a File Not Found error will result.

—R.V. TAYLOR, LITTLE ROCK, AR

### ON-ELSE

To check single-character entries for accuracy, I use a seldom-seen Basic command—On X Goto. You can use it much like If-Then-Else, which Basic 2.0 does not have. Here's a short program to show how it works.

```
10 PRINT"{SHFT CLR} TRY AGAIN? (Y/N)"
20 GET A$:IFA$=""GOTO20
30 ON-(A$="Y")+2*(A$="N")GOTO 100,200:GOT
  O10
40 :END
100 PRINT"YES":END
200 PRINT"NO"
```

Line 30 allows the computer's logic to make the comparisons. If a comparison is true (e.g., A\$="Y"), the computer will have a negative integer as the result (-1 in this example). If none of the comparisons matches, the result will be a zero, which the computer's logic considers to be false.

Since only one can be true, the result in this short program would be 0 (none true), -1 if A\$="Y" or -2 if A\$="N". The minus sign after ON will change the sign to a positive number that ON can handle. If the value is 1, then the first Goto (100) branch is taken; if the value is 2, the program goes to 200; if the value is 0, then the statement *after* all line



# MAGIC

numbers is executed (the ELSE part), which, in this case, sends the program for another character.

—PAUL N. LACEY, PICKERINGTON, OH

## 64 YARD DASH

I teach computer science at a small private school. Unfortunately, we do not have as many computers as we'd like, and, until now, fighting over computer time had been a real problem. The 64-Yard Dash program is my solution. (The program should also run on the C-128.)

Type in the program and run it. You'll be asked to give the number of students and their initials (two characters). The program will randomly choose the order in which students may use the computer. Watch out for clever students who might try to alter the program in their favor (this is the voice of experience speaking).

```
100 PRINT"{SHFT CLR}{CTRL 2}"TAB(14)"64 YAR
D DASH":POKE53280,0:POKE53281,0
110 INPUT"{2 CRSR DNs}NUMBER OF PEOPLE (8 M
AX)";N:IFN>8ORN<1THENRUN
120 FORA=1TON
130 PRINT"{HOME}{6 CRSR DNs}INITIALS OF PER
SON #{8 SPACES}{8 CRSR LFs}";:INPUTN$(A
)
140 IFLEN(N$(A))<>2THEN130
150 NEXT
160 PRINT"{SHFT CLR}{CRSR DN}"TAB(14)"64 YA
RD DASH{3 CRSR DNs}"
170 PRINTSPC(38){COMD S}"
180 FORL=1TON*2:PRINTSPC(38){SHFT B}:NEXT
190 PRINTSPC(38){COMD X}{HOME}{5 CRSR DNs}
"
200 FORA=1TON:PRINTN$(A):PRINT:NEXT
210 TI$=""000000"
220 R%=1+N*RND(.):PRINT"{HOME}{3 CRSR DNs}"
:FORK=1TOR%:PRINT"{CRSR DN}":NEXT:P(R%)
=P(R%)+1
230 IFP(R%)>34THEN220
240 PRINTSPC(P(R%)+2){CTRL 9}{CTRL 2}{CRS
R DN}{CRSR LF}{CTRL 6}{CRSR UP}{CTRL 9
}{CTRL 2}{CRSR DN}{CRSR LF}{CTRL 6}{CT
RL 0}{SHFT LB.}"
250 IFP(R%)=34THEN270
260 GOTO220
270 W=W+1:T$=MID$(STR$(INT((TI/60)*100)/100
),2)
280 PRINTSPC(25){CTRL 9}{CTRL 2}{2 CRSR UP
s}"T$TAB(30)"SEC"TAB(34)"["MID$(STR$(W)
,2)"]":IFW<NTHEN220
290 PRINT"{HOME}{23 CRSR DNs}"TAB(13){CTRL
2}PRESS ANY KEY."
300 GETA$:IFA$=""THEN300
```

—SCOTT M. HUSE, SALISBURY CENTER, NY

## KEYBOARD TONE

Some computers have a built-in keyboard tone feature that emits a clicking sound to confirm that a key was pressed. My program adds this feature to a C-64. To disable the keyboard tone, press the run-stop/restore combination; to re-enable it, type SYS679.

```
1 REM C-64 KEYBOARD TONE-RICHARD PENN
10 FOR U=679TO755:READQ:POKEU,Q:CK=CK+Q:NEX
T
```

```
11 IF CK<>9477THEN PRINT"ERROR IN DATA":END
12 SYS679
13 DATA 120,169,180,141,20,3,169
14 DATA 2,141,21,3,88,96,166
15 DATA 197,228,2,240,55,134,2
16 DATA 224,64,240,49,169,15,141
17 DATA 24,212,169,0,141,5,212
18 DATA 169,240,141,6,212,169,30
19 DATA 141,1,212,169,0,141,0
20 DATA 212,169,17,141,4,212,160
21 DATA 0,162,0,232,224,255,208
22 DATA 251,200,192,12,208,244,169
23 DATA 16,141,4,212,76,49,234
```

—RICHARD PENN, MONTREAL, QUEBEC, CANADA

## BAR CHART DEMO

This short program creates colorful bar charts to demonstrate a programming technique for presenting data graphically. The program uses random values to simulate the data needed to generate bars of various sizes and colors. If you've wanted to include bar charts in your Basic programming, but thought it might be too difficult, you might find helpful ideas in this demo program.

```
10 REM 64 BAR CHARTS-J.R.CHARNETSKI
20 POKE53280,3:POKE53281,1:BW$="{CTRL 9}{2
SPACES}":CU$="{2 CRSR UPs}"
30 PRINT"{SHFT CLR}{CTRL 1}{2 CRSR DNs}"
40 FOR I=1TO20:PRINT TAB(4){SHFT P}:NEXT
50 PRINTTAB(4);:FOR I=1TO32:PRINT"{COMD Y}"
;:NEXT:BX=6
60 BC=INT(RND(0)*15)+2
70 BY=INT(RND(0)*20)+1:POKE 646,BC:PRINT CU
$
80 FOR BAR=1TOBY:PRINT TAB(BX)BW$CU$:NEXT:P
RINT"{CTRL 1}"
90 FOR CD=1TOBY:PRINT TAB(BX+2){CTRL J}:N
EXT:BX=BX+3:IFBX>36 THEN 60
100 PRINT"{HOME}REPEAT DEMO (Y/N)?"
110 GET A$:IF A$=""Y"THEN 30
120 IF A$="N"THEN PRINT"{SHFT CLR}":END
130 GOTO110
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

## SCREEN ERASER

My subroutine adds a touch of magic to any Basic program by erasing the screen from four directions in a sequence that starts at the edge of the screen and erases toward the center. The more characters it has to erase, the more visually attractive is the effect.

```
10 REM 64 SCREEN ERASER-CHRIS CHARNETSKI
20 H$=CHR$(19):S$="" :V$=S$
30 FOR A=1TO23:V$=V$+CHR$(157)+CHR$(17)+S$:
NEXT:V$=V$+H$
40 FOR A=0TO12:PRINT H$;TAB(A)V$:POKE781,A:
SYS59903
50 PRINT H$;TAB(39-A)V$:POKE781,24-A:SYS599
03:NEXT:SYS58692:REM RETURN
```

—CHRISTINE N. CHARNETSKI, PLAINS, PA

## EASY C-64 BORDER

My short program prints a border on the C-64 screen. Because the program uses Pokes to print the border char-



acters, the border can occupy the edge of the screen, leaving a maximum area for your text and graphics. In line 10, S is the border character and C is its color. As listed, the border character is a reversed space and the color is white.

```
Ø REM EASY BORDER-ANDREW D RILEY
1Ø S=16Ø:C=1:L=1Ø23:PRINT"{SHFT CLR}{CTRL 2
 }":POKE5328Ø,Ø:POKE53281,Ø
2Ø FOR Z=1TO4:READX,Y:FOR I=1TOX:L=L+Y:POKE
 L+54272,C:POKE L,S:NEXT:NEXT
3Ø DATA 4Ø,1,24,4Ø,39,-1,23,-4Ø
```

—ANDREW D. RILEY, CAMDEN, OH

## TYPING FROM RIGHT TO LEFT

I've written a subroutine for my Hebrew tutor programs so the user can type in text from right to left. For entering Hebrew or any language that reads from right to left, this routine is a must. It might also be helpful for certain games.

```
499 REM TYPING RIGHT-LEFT SUB-R.M. HARRIS
50Ø PRINT CHR$(147):RO=Ø:CL=39
51Ø GET V$:IF V$=""THEN51Ø
52Ø IFV$="{COMD X}"THEN RETURN:REM EXIT
53Ø POKE781,RO:POKE782,CL
54Ø POKE783,Ø:SYS 6552Ø
55Ø PRINT V$;
56Ø CL=CL-1:IFCL<ØTHENCL=39:RO=RO+1
57Ø GOTO51Ø
```

—RICHARD M. HARRIS, SEATTLE, WA

## CUSTOMIZED DOS WEDGE FOR YOUR C-64

Here's a way to customize the DOS 5.1 Basic loader. Save the following program with the filename "I"; be sure the DOS 5.1 ML program is also added to your disk.

```
Ø REM DOS LOADER+ BY KARL JOHNSON
1Ø IFA=ØTHENA=1:LOAD"DOS 5.1",8,1
2Ø OPEN1,8,15:PRINT#1,"M-W"CHR$(1Ø6)CHR$(Ø
 )CHR$(1)CHR$(133):CLOSE1
3Ø FORJ=679TO688:READK:POKEJ,K:NEXT:POKE77
 4,167:POKE775,2
4Ø SYS 52224:PRINT"{SHFT CLR}{CTRL 2}"
5Ø POKE5328Ø,12:POKE53281,Ø:FORJ=631TO634:
 READK:POKEJ,K:NEXT:POKE198,4:NEW
6Ø DATA 72,173,141,2,2Ø8,251,1Ø4,76,26,167
 ,177,36,48,13
```

Then load and run the program (see page 28 of the February 1986 *RUN* for a summary of the DOS Wedge commands).

Now you're ready to perform some time-saving magic. Type in this line:

```
L{SHFT O} "I".8:{SHFT RUN-STOP}
```

Like magic, the Wedge and Pause features are loaded and ready to use.

The program also lists the disk directory so that you can run any Basic program by moving the cursor up to the filename, typing an up arrow and pressing return. Line 20 reduces the head-knocking caused by some copy-protection schemes. You can freeze a scrolling screen with either the control, Commodore, shift or shift-lock keys. Release the key when you're ready to continue.

—KARL JOHNSON, HOUSTON, TX

## DIRECTORY NAME ARRAY 64

The program below reads a disk directory, places each of the filenames into a one-dimensional array and prints out the filenames, using Basic code.

After you load and run the loader program, be sure to dimension a string array for the filenames as the first array in your program. Then call up the program with SYS828, which reads the filenames into the array with the number of files stored in location 254.

Here's an example of how to use the program, assuming the loader was run to poke the machine language into memory:

```
10 DIM A$(144):SYS 828:E=PEEK(254)
20 FOR C=1TOE:PRINT A$(C):NEXT:END
```

The program quickly reads the names into the array. The names are actually stored in the "free" area at 49152 (\$C000), so you can store the array without using any of Basic's memory.

```
1Ø REM C-64 DIRECTORY READER-MARK NEWTON
15 C=Ø:FORA=828TO1ØØ6:READ B:POKE A,B:C=C+
 B:NEXT
2Ø IF C<>226Ø2 THEN PRINT"DATA ERROR..."
25 DATA 169,14,162,8,16Ø,Ø,32,186,255,169,
 4,162,235,16Ø,3,32,189,255,32,192
3Ø DATA 255,162,14,32,198,255,16Ø,Ø,14Ø,57
 ,3,132,25Ø,14Ø,56,3,165,48,133
35 DATA 254,24,165,47,1Ø5,7,144,2,23Ø,254,
 133,253,169,Ø,133,251,169,192,133
4Ø DATA 252,16Ø,1,32,2Ø7,255,166,144,24Ø,1
 5,32,2Ø4,255,169,14,32,195,255
45 DATA 172,56,3,136,132,254,96,192,6,144,
 45,2Ø1,34,2Ø8,1Ø,173,57,3,73,1
5Ø DATA 141,57,3,16,31,174,57,3,2Ø8,3Ø,192
 ,32,2Ø8,22,16Ø,Ø,165,25Ø,145,253
55 DATA 132,25Ø,24,165,253,1Ø5,3,144,2,23Ø
 ,254,133,253,76,119,3,2ØØ,76,121
6Ø DATA 3,14Ø,59,3,16Ø,Ø,145,251,165,25Ø,2
 Ø8,14,16Ø,1,165,251,145,253,2ØØ
65 DATA 165,252,145,253,238,56,3,23Ø,25Ø,1
 72,59,3,23Ø,251,2Ø8,2,23Ø,252,76
7Ø DATA 166,3,36,48,58,42
```

—MARK E. NEWTON, JAMESTOWN, IN

## TURBO-CURSOR

These Poke commands will make the cursor move much faster around the screen, which is helpful in programs requiring frequent cursor use. Just enter this line:

```
POKE 650,128:POKE 56325,10
```

Poking location 650 with 128 enables all the keys to repeat. You can change the cursor's speed by poking different values into location 56325 (lower numbers give faster speeds).

—M. PELLEGRINO, SPENCER, MA

## FADE-IN/FADE-OUT TEXT

I use the technique of "fading" in my screen titles to give my presentations a professional look. The subroutine I use (lines 1000-1080) shows how to employ the technique. I put my title or message in variable A\$, the location numbers of the screen lines I want my message to appear on in variable A, and then call up the subroutine. If you want to pro-



## MAGIC

duce a fade-out effect, just add REM in front of DATA in line 1060.

```
10 REM MAGIC FADING BY DON JONES
20 PRINT "{SHFT CLR}":POKE53281,0
30 A$="{17 SPACES}FADING":A=2:GOSUB1000
40 A$="{19 SPACES}IS":A=3:GOSUB1000
50 A$="{17 SPACES}MAGIC!":A=4:GOSUB1000
60 A$="{14 SPACES}BY DON JONES":A=6:GOSUB1000
70 PRINT "{CTRL 2}":END
1000 REM *FADE-IN ROUTINE*
1010 FOR L=1TO5
1020 PRINT "{HOME}{CRSR UP}";:FORPD=1TOA:PRINT "{CRSR DN}";:NEXTPD
1030 READC,D:POKE646,C:PRINTA$;
1040 FORW=0TOD:NEXT
1050 NEXTL:PRINT:RESTORE:RETURN
1060 DATA 0,15,11,15,12,15,15,15,1,300
1070 REM FADE OUT DATA
1080 DATA 1,15,15,15,12,15,11,15,0,300
```

—DON JONES, VIRGINIA BEACH, VA

## TWINKLE, TWINKLE, LITTLE STARS

The short routine below fills the screen with twinkling stars. I first designed it as a backdrop for a space game and later found it useful as a visual distraction for users during a program's short waiting periods.

```
10 REM TWINKLING STARS-MARCO BALAGUER
20 PRINT "{SHFT CLR}":DEF FNS(A)=INT(RND(0)
*1000)
30 S=1024:D=54272:C=S+D
40 FORX=1TO50:F=FNS(X)
50 FORY=1TO2:FORR=1TO4:READA,B
60 POKES+F,A:POKEC+F,B
70 NEXT:RESTORE:NEXT:NEXT
80 DATA 86,1,91,5,42,7,46,1
```

—MARCO BALAGUER, BROOKLYN, NY

## PERFECT TYPIST IMPROVEMENT

One part of RUN's 64 Perfect Typist program that irritates me is the screen location of the checksum, which prints below the line I've just entered. This poses a problem when I want to check old listings or use an automatic line numbering program. So, I wrote the changes below to relocate the checksum to the home position. Make these line changes to the program.

Line 30: change ML+154 to ML+183  
Line 40: change 16251 to 20566  
Line 80: change ML+141 to ML+161

Also enter these lines:

```
0 REM 64 PERFECT TYPIST IN HOME POS-M.B.
ENDERS
260 DATA 021,141,240,003,166,214,202,142
262 DATA 242,003,169,000,133,212
263 DATA 169,019,032,210,255,169
266 DATA 018,032,210,255,169,042,032,210
```

```
270 DATA 255,169,000,174,240,003,032,205
280 DATA 189,162,002,189,241,003,032,210
290 DATA 255,202,016,247,164,011,174,242
300 DATA 003,134,214,169,013,032,210,255
310 DATA 096,146,032,032
```

Be sure you save the new program before running it.

—MICHAEL B. ENDERS, FORT WAYNE, IN

## DIRECT MODE DISK-ERROR READER

The next time you need to read the disk error channel with your C-64 and you don't have the DOS Wedge in memory, try this handy line in Direct mode:

```
OPEN1,8,15:POKE58,0:{about 20 spaces}INPUT#1,A$,B$,C$,D$:
?A$,B$,C$,D$:CLOSE1
```

The exact number of spaces isn't important, as long as you type in about 20.

—RICHARD PENN, MONTREAL, QUEBEC, CANADA

## GETSPEED

This short machine language program prints a sequential file to your monitor screen. It will prompt you for the filename, then print and close the file.

```
10 REM 64 GETSPEED - IVO SALMRE
20 FORA=820TOA+57:READB:POKEA,B:NEXT
30 DATA 169,005,162,241,160,003,032,189,25
5,169
40 DATA 003,162,008,160,003,032,186,255,03
2,192
50 DATA 255,162,003,032,198,255,032,159,25
5,201
60 DATA 032,240,016,032,183,255,201,064,24
0,009
70 DATA 032,207,255,032,210,255,076,078,00
3,169
80 DATA 003,032,195,255,032,204,255,096
90 INPUT"FILENAME TO READ":A$
100 FORX=1TOLEN(A$):POKE1008+X,ASC(MID$(A$,
X,1)):NEXT
110 POKE821,LEN(A$):SYS820
```

—IVO SALMRE, NORWALK, CT

## WEDGE HANDLER

If you're like me, you'll want a copy of the DOS Wedge on each of your disks. I use the following program to load and boot the Wedge's DOS 5.1 program. Then, whenever I want to copy the machine language program onto other disks, that option is always available, and I can even save my wedge handler at the same time.

```
10 PRINT "{SHFT CLR}C-64 WEDGE HANDLER - JO
E CHARNETSKI"
20 IF BY=0 THEN BY=52224:F$="DOS 5.1":LOAD
F$,8,1
30 INPUT "{CRSR DN}(B)OOT OR (C)OPY":A$:IFA
$="B"THEN PRINT "{SHFT CLR}":SYS BY:NEW
40 ON-(A$<>"C")GOTO30:INPUT "{CRSR DN}COPY
THIS PROGRAM TOO (Y/N)":B$
```



## MAGIC

```
50 PRINT"{CRSR DN}INSERT TARGET DISK - HIT
  ANY KEY"
60 GET C$:IF C$="" GOTO 60
70 OPEN15,8,15,"I0":OPEN7,8,9,F$+",P,W"
80 INPUT#15,D,E$:IF D THEN PRINT E$:GOTO110
90 PRINT#7,CHR$(0);CHR$(204);
100 FOR I=0TO857:PRINT#7,CHR$(PEEK(I+BY));
  :NEXT
110 CLOSE7:IF B$="Y"THEN SAVE "WEDGE HANDL
  ER",8:INPUT#15,D,E$:PRINT E$
120 IF D=0 THEN PRINT"DONE."
130 CLOSE15:GOTO30
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### INSTR FUNCTION

The C-128 has a handy INSTR function for finding the position of one string within another. The following subroutine will give the same results on the C-64:

```
10 REM 64 INSTR-DON JARVIS
1000 XA=LEN(A$):XB=LEN(B$):XX=0:SP=1:REM S
  TART POS OPTIONAL
1010 FORXE=SP TO XA-XB+1:IF MID$(A$,XE,XB)
  =B$ THEN XX=XE:XE=XA
1020 NEXT:RETURN
```

Variables A\$ and B\$ are the long string and the substring you want to find, respectively. The position of the first letter match is returned in variable XX. A value of 0 means that no match was found. Be sure not to use the variables in the subroutine—XA, XB, XE, XX and SP—in other parts of your program. You might get strange results.

—DON JARVIS, MIAMI, FL

### SIMPLE SPRITE EDITOR

I've written a very simple sprite editor for the C-64:

```
0 REM SPRITE DESIGNER-CHRIS BUTLER
10 PRINT"{SHFT CLR}";:POKE650,128
20 FOR T=1TO21:FORQ=1TO24:PRINT".";:NEXT:P
  RINT:NEXT
30 V=53248:POKEV+21,4:POKEV+41,1
40 POKEV+4,255:POKEV+5,200
50 POKE2042,13:END
100 Q=0:C=8:FOR Y=0TO21:FORX=1TO24
110 P=PEEK(1023+X+40*Y)
120 C=C-1:IFP=42THENQ=Q+2{UP ARROW}C
130 IFC=0THENC=8:G=G+1:POKE831+G,Q:Q=0
140 NEXTX:NEXTY:END
200 PRINT"{SHFT CLR}{2 CRSR DNs}":K=0:FOR
  =0TO63:IFK=0THENPRINT"{5 SPACES}DATA "
  ;
210 PRINTRIGHT$(STR$(1000+PEEK(832+T)),3)"
  ,";
220 K=K+1:IFK=8THENK=0:PRINT"{CRSR LF} "
230 NEXT:POKE53248+21,0:END
```

To use the program, run it, and the blank sprite will be printed on the screen. Now fill in the sprite, using the \* character for dots you want on, and any other for dots off.

When the sprite is finished, move the cursor to the blank line above the Ready prompt and type in RUN 100. The program will scan the screen and print the sprite in actual size to the right of the grid. Then you can change it if necessary.

When your sprite is the way you like it, move the cursor above the word READY again and type in RUN200. This will create Data statements for the sprite. After they're printed to the screen, just add line numbers and press return for each line.

—CHRIS BUTLER, ANNAPOLIS COUNTY, N.S., CANADA

### COMPACT MENUS

Here's an alternative to vertically oriented menus. My routine uses two lines at the top of the screen to display a professional-looking menu with eight options. To make your choice, press the cursor-right key until the desired option is highlighted and then press return. If you use other titles for the menu, be sure they're eight characters long.

```
10 REM C-64 MENU LINES-J.R.CHARNETSKI
20 POKE53280,2:POKE53281,0
30 S=8:DIMM$(S):SP$=" ":HL$="{CTRL 2}"
40 MC$="{CTRL 5}":PRINT"{SHFT CLR}"MC$
50 FOR I=1TOS:M$(I)="OPTION "+CHR$(64+I):N
  EXT:GOTO90
60 GET A$:IF A$="{CRSR RT}"GOTO90
70 IF A$<>CHR$(13)GOTO60
80 PRINT"{CTRL 2}";:ONXGOTO130,130,130,130
  ,130,130,130,130
90 PRINT"{HOME}{CTRL 9}";:X=X+1:IFX>STHENX
  =1
100 FORI=1TOS:IFI<>XTHENPRINT SP$M$(I)SP$;
  :GOTO120
110 PRINT SP$HL$M$(I)MC$SP$;
120 NEXT:PRINT:GOTO60
130 PRINT "YOUR CHOICE: "M$(X)
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### SMALLEST C-64 TRACE

Here's the smallest trace program for the C-64, and it's very easy to use. Line 10 is the trace program and the other lines show an example of the trace. To turn the trace on, use POKE777,2 and turn it off with POKE777,167.

```
0 REM SMALLEST 64 TRACE-DAVID PANKHURST
10 POKE740,32:POKE741,194:POKE742,189:POKE
  743,76:POKE744,228:POKE745,167
20 POKE 777,2:REM TRACE ON
30 PRINT"TRACING"
40 PRINT X
50 REM
60 DATA 4
70 CLR
80 IF X=0THEN X=1
90 POKE 777,167:REM TRACE OFF
100 X=1:Y=1:Z=1
```

—DAVID PANKHURST, MONTREAL, QUEBEC, CANADA



## 2. COMPUTERS—C-128

### INPUT WINDOWS

The Commodore's Input routine can easily mess up your carefully planned screen format. How many times have you accidentally pressed a cursor key, only to send any additional input off to another part of the screen? You can avoid unnecessary delays by setting up a small window on the screen, as demonstrated in the following example:

```
1Ø REM WINDOW INPUT - LEE SEMEL
2Ø S=1Ø:REM WIDTH OF WINDOW
3Ø PRINT"{2 HOMEs}":REM WINDOW=ENTIRE SCREE
  N
4Ø PRINT"{SHFT CLR}YOUR ANSWER"CHR$(27)"M"
5Ø WINDOW Ø,1,S+1,1:REM WINDOW ON SECOND LI
  NE
6Ø INPUT A$:PRINTCHR$(27)"L"
7Ø PRINT"{2 HOMEs}"
```

The variable S establishes the width of the window, and the escape codes in lines 30 and 50 disable and enable the screen scroll, respectively. This will keep your text from going too far astray.

—LEE SEMEL, EDISON, NJ

### KEY-REPEAT CONTROL

If you've upgraded to a C-128 from a C-64, you might prefer the keys on the C-128 to repeat as the C-64's keys do. Use POKE 2594,128 (the default) to make all the keys repeat; use POKE 2594,0 to make only the space bar, insert-delete and cursor keys repeat; use POKE 2594,64 to prevent all keys from repeating.

—DAVID C. MCKENZIE, CHARLOTTE, NC

### LOWERCASE CHARACTERS

Have you ever wanted to use lowercase text on-screen in the C-128's 40-Column (hi-res) mode? Well, now you can, by simply including a CHR\$(14) before the text you want to type. Look at the example below: The line will print an uppercase "M" and lowercase "agic":

```
Ø REM LOWER CASE CHAR - CARLOS CASTELLANOS
1 :
2 REM ----DELETE ALL BUT LINE 1Ø TEXT----
3 :
1Ø CHAR 1,Ø,Ø,CHR$(14)+"{SHFT M}AGIC",1
```

—CARLOS A. NERI CASTELLANOS,  
GUADALAJARA, JALISCO, MEXICO

### EXTRA F KEYS

Did you know that you can add two function keys to the eight already on the C-128? The help key and the shift/run-stop combination can be redefined as function keys with the SYS commands in the listing below.

```
Ø REM EXTRA F-KEYS - SHAWN K SMITH
1Ø BANK15:SYS DEC("6ØEC"),,8,,,"NO RUN *"
2Ø BANK15:SYS DEC("6ØEC"),,9,,,"DON'T HELP"
```

You can substitute anything you wish between the quotes,

including CHR\$, in place of the strings given in these examples.

—SHAWN K. SMITH, BRONX, NY

### RESTORE DISABLE

If you type in the Pokes below, you'll never have to worry about accidentally using the run-stop/restore combination and risk losing important information:

```
POKE 792,51:POKE 793,255
```

—PABLO M. EDER, BUENOS AIRES, ARGENTINA

### C-64 PROGRAMS ON THE C-128 II

Magic trick \$326 (September 1986) recommends using the C-128 mode to type in C-64 programs because of the 128's extra editing features and its faster disk access. The trick also states that the programs should load and run without trouble in C-64 mode.

The advice is good, with one proviso: Don't let any Basic 7.0 keywords creep into your "C-64" programs. Should that happen, the C-128 will reduce the keyword to a 128 one- or two-character token the C-64 will not recognize. The only way of knowing you have this problem is when the line causes an error and, if listed, will either be missing a word or contain strange characters. For example, if you enter FOR LOOP = . . ., the C-128 will tokenize the (C-64) loop variable into a keyword token and will list in 64 mode as FOR CLOSE = . . . You can simply edit the line in 64 mode and save the program to cure this problem. Or, if you recognize the keywords as they are entered in 128 mode, just type a Z between the first two letters. Basic will ignore the Z but will not tokenize the keyword.

—ROBERT IRVING, NORTHRIDGE, CA

### SPEEDY SPRITES

My trick speeds up sprite animation on the C-128. By poking values directly into memory locations used by Basic to store speed information, a sprite can have a speed between 0 and 255. Enter this line in Direct mode to start a sprite moving:

```
SPRITE 1,1,1:MOVSPR1,45#15
```

Notice the speed of the sprite and then enter:

```
POKE 4478,35
```

This tells Basic to give the sprite a speed of 35. There is a limit to how fast a sprite can move without showing up at several locations on the screen at the same time. Try different values to see which work best for you. The memory locations needed to speed up the other sprites are as follows:

Sprite 1: 4478	Sprite 4: 4511	Sprite 7: 4544
Sprite 2: 4489	Sprite 5: 4522	Sprite 8: 4555
Sprite 3: 4500	Sprite 6: 4533	

—DAVID A. DYE, PHOENIX, AZ

### LONG C-64 LINES

There are obvious advantages in using a C-128 to develop C-64 programs. But I've got a useful trick you may not be aware of.

In 128 mode, you can type up to 160 characters on each program line. This is helpful with long data sections and conditional clauses, and it can lead to fantastic "one-liners."

Once you've finished developing your program, save it. ▶



## MAGIC

Now comes the surprise. Load it in 64 mode—the program will run perfectly. Of course, such lines can then only be changed in 128 mode. You can also use this trick in reverse to edit long lines entered on a C-64 by using keyword abbreviations.

—GERHARD SCHILLING, HEMET, CA

### HI-RES SCREEN SAVER

The August 1986 Magic contains a trick (\$31A) that shows you how to save a text screen on the C-128. Until now, this utility couldn't save a hi-res screen.

First, draw your picture on the hi-res screen, and save it with:

```
BSAVE"screen",P7168 TO P16383
```

To recall it, set up the proper graphic mode with the Graphic command and type:

```
BLOAD"screen"
```

*Voilà!*—there's your picture. Each picture will occupy 37 blocks on your disk.

—CHAD OLIVER, ST. ANNE, IL

### DATAFILEREPORTMAIL

Mike Konshak's Datafile program can be improved by appending the DFReport and DFMail programs to the Datafile program. This is easily accomplished with a few changes.

First load Datafile. Then type the following line in Direct mode (without a line number) to set the "beginning" of the load:

```
Z = 65278 - FRE(0);POKE 45,ZAND255:POKE 46,Z/256
```

Next, load the DFReport program in the normal manner. Move the cursor up to the line above and press return again. Finally, load DFMail. The programs are now appended into one long program, but you must type the following line to restore the pointer to the start of the Datafile program:

```
POKE 45,1:POKE 46,28
```

Next, use the Delete command to delete lines 508-516 and 1010-1018 (be careful!). Now make the following changes and save the new program.

```
1 REM "C-128 {SHFT D}ATAFILE{SHFT R}EPORT{S
  HFT M}AIL-ED WILLIAMS
382 GOTO1000
384 GOTO500
636 IFC$="E"THENPRINT#4:CLOSE4:GOTO 10
638 IFC$="M"THENPRINT#4:CLOSE4:GOTO1000
1124 IFC$="E"THENPRINT#4:CLOSE4:GOTO10
1126 IFC$="R"THENPRINT#4:CLOSE4:GOTO500
```

You'll no longer have to access the disk drive when you want to use DFReport or DFMail; they'll always be in memory when you want them!

—ED WILLIAMS, WALKERVILLE, MT

### SONATINA IN C-128

The following program plays the "Sonatina in C" by Mozart.

```
10 REM SONATINA IN C-JESSE B BROWN
20 TEMPO 24:PLAY"V104T0U11X0":PLAY"V203T5U1
```

```
1X0"
30 A$="V105WCV203QCQGGQGM V105HE V203QBQG
V105QG V203QEQQM V104.HB V203QDQGGQFQ V1
05ICIDM V105WC V203QCQGGQGM"
40 B$="V105WB V203QCQAQFQAM V105HG V203QCQG
V106HDV203QEQQM V105HG V202QB03QGGD V10
5IGIFIE V203QG V105IFM V105WE V203QCQGGQ
QGM"
50 C$="V104QA V203QFQRHR V104QB05QCQDQEQQFQ
M V203QF V105QAQGGQFQE V203QAAF V105QDQCO
4QBQA V203QAMQE V104QGGQAQB V203QRHR V105
QCQDQEQQM"
60 CC$="V203QE V105QGQFQEVD V203QGQE V105QC
04QBQAQGM"
70 D$="V203QD V104QFQGGQA V203QRHR V104QB05Q
CQDQEM V203QD V105QFQEQQD V203QFQD V104
QBQAQGGQ V203QFMQC V104QEQQV203QG V104.Q
CV203QE V104.QC V203QG V104.QCM"
80 DD$="V104.HC V203QEQQCQR V104QRM"
90 PLAY A$+B$:PLAY C$+CC$:PLAY D$+A$:PLAY B
$+C$:PLAY CC$+D$:PLAY DD$
```

—JESSE B. BROWN, EUNICE, LA

### C-128 VARIABLE STORAGE

When you edit a Basic line in your efforts to debug a C-64 program, all the variables are lost, which can be quite bothersome. The C-128 has two 64K banks of memory, and Basic 7.0 stores the program and variables separately. Therefore, when you edit a Basic 7.0 program line, the variables in memory are not affected. This can be a valuable, time-saving feature when you're debugging.

—RICK SELLERS, LITTLE ROCK, AR

### ML BANK SWITCHING

The table below gives the value to store in the memory management unit—MMU (\$F00)—to change banks in machine language. You should be in "common" memory when you use this method, or your program will try to continue at the next location in the new bank.

Bank	Value	Bank	Value	Bank	Value
\$0	\$3F	\$6	\$96	\$B	\$EA
\$1	\$7F	\$7	\$D6	\$C	\$06
\$2	\$BF	\$8	\$2A	\$D	\$0A
\$3	\$FF	\$9	\$6A	\$E	\$01
\$4	\$16	\$A	\$AA	\$F	\$00
\$5	\$56				

—BEN KRANICH, WARREN, MI

### INPUT CONTROL

In the September 1986 issue of *RUN*, trick \$32F for the C-64 put an "invisible" quotation mark in an Input statement so that you could enter commas and colons when inputting data. My program does the same thing on the C-128 in 128 mode.

```
10 REM C-128 INPUT CONTROL-SUE HOFFMAN
20 PRINT"[PROMPT HERE]";:TC=RCLR(5):SW=PEEK
(215):IFSW<>0THENSW=6
30 COLOR5,RCLR(SW):PRINT"{2 CRSR RTS}"CHR$(
34)CHR$(27)"O{3 CRSR LFS}";
40 COLOR5,TC:POKE208,1:POKE842,29:INPUTA$
50 PRINT"A$="A$:IFA$<>"END"GOTO20
```

—SUE HOFFMAN, HUDSON, WI

Continued on p. 67.



**RUN's**

# *The Best of Magic*

USEFUL HINTS AND TIPS from the "Magical" world of Commodore computing.

When it comes to high-quality hints and tips for your Commodore computer, no one does it better than *RUN*.

Now, we bring you the Limited Edition—a special collection of up to 200 of THE VERY BEST hints and tips to make computing more productive and enjoyable.

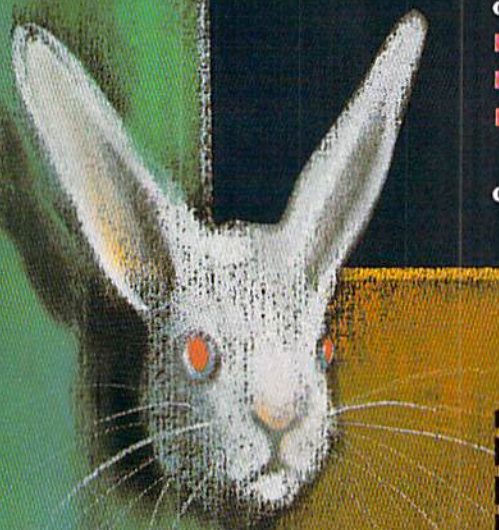
This one convenient source represents the cream of the crop. You will not find this unique collection of Magic tricks offered elsewhere.

As a special bonus, this 64-page booklet also contains tables and charts of information that make programming the Commodore 64 and 128 computers easier.

Whether you're a novice or experienced C-64 or C-128 user, *The Best of Magic* will bring you information of lasting value. Organized by topic for easy reference.

- Disk tips
- Programming hints
- Printer usage techniques
- Graphics
- Music
- Home applications

A limited supply is available. Be sure to order your copies now; **THEY WON'T LAST!**



Yes, I want \_\_\_\_\_ copy(s) of the LIMITED EDITION at \$4.95 (plus \$1.00 1st CLASS POSTAGE and handling each copy). Enclosed please find my check or money order in the amount of \$ \_\_\_\_\_.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

(Canada and foreign \$10.95 U.S. funds.)

Send check or money order (sorry, no charge orders) to:

LIMITED EDITION  
80 Elm Street  
Peterborough, NH 03458

BMSP87



# Easy Applications

## Flash Cards

*If your child is learning arithmetic, or you're a bit rusty yourself, use this program for review.*

By **BARBARA SCHULAK**

**F**lash Cards provides flash card-type arithmetic practice on the computer, eliminating the need to buy or make sets of paper cards. The program is designed for interactive use between a child and parent, but youngsters can use it alone to a certain extent. A joystick plugged into port 2 is required for operation.

When you run the program, it will first ask for the type of problem your child wants to practice: addition, subtraction, multiplication, division or an assortment of all four.

Then you must select the range, 0-9, of numbers to be used. For example, if you choose 0 as the lower limit and 5 as the upper limit after selecting multiplication, you'll get problems with a multiplier in the range 0-5 and a multiplicand (the number being multiplied) in the range 0-9. If you specify the same number for both the lower and upper limits, your child can practice just one multiplication table, such as 5 times 0 through 9. This flexibility in choosing numbers makes Flash Cards appropriate for children at all levels.

Your final choice is how long the program should run. You can select any length of time from one to nine minutes, depending on your child's attention span.

After you've responded to all the options, Flash Cards will begin displaying problems in large numerals on the screen. When your child gives a correct answer, push the joystick fire-button to advance to the next problem. If the child doesn't know the answer to a problem, push the

joystick in the up direction to display the answer. Then, push the fire-button to move to the next problem.

Continue this process until time runs out. At the end of the program, the time elapsed and number of problems answered correctly are displayed. Press Y to play again.

I deliberated long and hard on whether to make Flash Cards respond to keyboard replies or to require a person-to-person verbal response. I finally settled on the verbal response, even though the computer can't check the correctness of the answers, because I felt typing might slow a child down in a speed drill. Also, verbal responses get parents involved in the learning experience.

My children have enjoyed Flash Cards, and their math skills have improved rapidly. I hope you and your youngsters enjoy it, too.

### ► RUN it right: C-64

#### Listing 1. Flash Cards program.

```
10 X=RND(-TI):S=54272:NP=0:DIMA
   $(9,5) :REM*66
20 W$="FLASH CARDS" :REM*114
30 POKES3281,0:PRINT"{SHFT CLR}
   {CTRL 8}" :REM*212
40 FORI=0TO24:POKES+I,0:NEXT
   :REM*198
50 FORI=1TO11:PRINT"{HOME}{10 C
   RSR DNs}"SPC(14)LEFT$(W$,I):
   POKES3280,I:GOSUB1330:NEXT
   :REM*146
60 FORI=0TO9:FORJ=1TO5 :REM*120
70 READA$(I,J) :REM*186
80 NEXT:NEXT :REM*84
```

```
90 PRINT"{SHFT CLR}{CTRL 9}{COM
   D 1}{14 SPACES}FLASH CARDS{1
   5 SPACES}" :REM*184
100 PRINT"{3 CRSR DNs}{CTRL 2}"
   SPC(5)"[1] ADDITION :REM*40
110 PRINTSPC(5)"[2] SUBTRACTION
   :REM*192
120 PRINTSPC(5)"[3] MULTIPLICAT
   ION :REM*68
130 PRINTSPC(5)"[4] DIVISION
   :REM*218
140 PRINTSPC(5)"[5] MIXED
   :REM*198
150 GETK$:IFK$=""THEN150
   :REM*178
160 T1=VAL(K$):IFT1<1ORT1>5THEN
   90 :REM*18
170 T2=T1:IFT1=5THEN2=1
   :REM*200
180 : :REM*156
190 PRINT"{SHFT CLR}{CTRL 9}{CO
   MD 6}{13 SPACES}FLASH CARDS
   {16 SPACES}" :REM*38
200 PRINT"{3 CRSR DNs}{CTRL 2}{
   2 SPACES}LOWER LIMIT OF PRO
   BLEMS (0-9):" :REM*130
210 GETK$:IFK$=""THEN210:REM*12
220 R1=VAL(K$):IFR1<0ORR1>9THEN
   200 :REM*80
230 PRINTK$ :REM*232
240 PRINT"{3 CRSR DNs}{CTRL 2}{
   2 SPACES}UPPER LIMIT OF PRO
   BLEMS (0-9):" :REM*102
250 GETK$:IFK$=""THEN250:REM*54
260 R2=VAL(K$):IFR2<0ORR2>9THEN2
   40 :REM*105
270 PRINTK$ :REM*17
280 IFR1>R2THEN190 :REM*65
290 R2=R2+1 :REM*137
300 IFT1=4ORT1=5ANDR1=0ANDR2=1T
   HEN1460 :REM*129
310 : :REM*31
320 PRINT"{SHFT CLR}{CTRL 9}{CO
   MD 7}{13 SPACES}FLASH CARDS
   {16 SPACES}" :REM*233
330 PRINT"{3 CRSR DNs}{CTRL 2}"
   SPC(5)"PLAYING TIME (1-9 MI
   N): " :REM*9
340 GETK$:IFK$=""THEN340
   :REM*113
350 TM=VAL(K$):IFTM<1ORTM>9THEN
   320 :REM*151
360 TM=TM*100 :REM*215
370 PRINT"{SHFT CLR}{CTRL 9}{CT
   RL 5}{13 SPACES}FLASH CARDS
   {16 SPACES}" :REM*157
380 PRINT"{5 CRSR DNs}{CTRL 2}" ►
```



**MONEY-BACK GUARANTEE \* TOLL-FREE 24 HOUR ORDER LINE**  
**WIDE SELECTION \* NO-NONSENSE LOW PRICES \* FREE CUSTOMER**  
**SUPPORT \* FRIENDLY & KNOWLEDGABLE STAFF \* IMMEDIATE SHIPPING**  
**PERSONAL ATTENTION \* FOREIGN, CANADIAN, & SCHOOLS WELCOME . . .**

**NEED WE SAY MORE? LET US EARN YOUR BUSINESS!!**

**GRAPHICS & CAD**

- Anti-Glare Screens \$18
- Banner Machine (Cardinal) 39
- BASIC 8 (Patech) 30
- SCREEN F/X (Solo Unlmt) 29
- Billboard Maker (Sol Unlmt) 29
- CAD 3D (IHT) 39
- Cadpak-64 (Abacus) 29
- Cadpak-128 (Abacus) 45
- Colorez 128 (B-Ware) 12
- Cybervideo (Touchstone) 30
- Doodle (Crystal Rose) 29
- Flexidraw 5.5 (Inkwell) 29
- Lightpen 170C 75
- Lightpen 184C 49
- FlexiFont 24
- Galleries - each 21
- Holiday/Clip Art I/Clip Art II/  
Borders/Animals/Futuristic/
- Graphics Integrator 2 (Inkwell) 25
- Graphic Label Wizard (Kra Jax) 19
- Graphics Transformer (CDA) 25
- Home Designer 128 (Kendall) 45
- Icon Factory (Solo Unlmt) 29
- Moving Pictures (CDA) 20
- Perspectives II (Kira) 39
- Picasso's Revenge (Progress) 49
- Photo Finish (Sol Unlmt) 25
- Pop-Up Greetings (Patech) 34
- Printmaster Plus (Unison) 25
- Art Gallery I or II 17

**AIDS/UTILITIES**

- 1541/1571 Dr. Align (Free Sp) 20
- 40/80 Column Switch Cables 19
- Assembler/Monitor (Abacus) 29
- Basic 8 (Patech) 30
- BASIC Compiler 128 (Abacus) 45
- BASIC Compiler 64 (Abacus) 29
- BBS Construction Set (Kira) 43
- Big Blue Reader (Sogwap) 25
- Big Blue Reader CP/M 32
- Bobsterm Pro 64 (Progress) 39
- Bobsterm Pro 128 (Progress) 49
- COBOL 64 (Abacus) 29
- Communicator 64 (FR SPRT) 20
- Gnome Kit 64/128 (Kira) 29
- Gnome Speed 128 (Kira) 39
- Gnome Mac 128 (Kira) 10
- How To Get Most GEOS Book 13
- How To Get Most GEOS Disk 9
- Kyan Pascal 64 or 128 52
- Merlin 64 (Roger Wagner) 39
- Merlin 128 (Roger Wagner) 49
- Phy Exam 1541 or 1571 (Card) 29
- Power Assembler 64/128 (Sp) 30
- Power C 64/128 (Spinn) 30

- Programmer's Tool Box (Spinn) \$17
- Prototerm 128 12
- Super C 128 or 64 (Abacus) 45
- Super Graphix (Xetec) 79
- Superkit 1541 (Prism) 25
- Super Rascal 128 or 64 (Abac) 45
- Super Snapshot (K. Jax) 49
- SYSRES Enhanced (Comp Mart) 32
- Troubleshoot & Repair C64 Book 16
- Turbo Load & Save Cart (Spinn) 19
- CPMI Kit 128 (Inca) 25
- TSDS Super Assembler 39
- Kracker Jax Volumes 1-6 EACH 17
- K Jax Loaded Shotgun 17
- K Jax C128 or MSD Cannon 29
- K Jax Bull's Eye 17

**HOME/BUSINESS**

- Accountant 128 (KFS) 119
- Add-on modules 55
- BEST A/P or A/R 45
- BEST G/L or Inventory 45
- BEST Project Planner 50
- Business Form Shop (Spinn) 30
- Checkbook 128 (Nu Age) 17
- CMS Accounting 128 129
- Inventory Module 53
- Easy Working Filer/Planner  
or Writer (Spinn) 10
- Fleet System 2 + (Professional) 39
- Fleet System 4 (Professional) 59
- Fleet Filer 64 (Professional) 29
- FlexFile 64 or 128 (Cardinal) 39
- Fontmaster 128 (Xetec) 35
- Fontmaster II 64 (Xetec) 39
- GEOS 128 (Berkeley) 49
- Add-ons call
- GEOS 64 (Berkeley) 39
- Geoprint or Geodex 35
- Geocalc or Geofile 35
- Fontpak I or Deskpak 1 22
- Writer's Workshop 33
- Microlawyer (Progress) 45
- Pocket Superpak 64 (Dig Sol) 49
- Pocket Superpak 2 64/128 69
- Pocket Dictionary (Dig Sol) 10
- Pocket Writer 64 (Dig Sol) 29
- Pocket Writer 2 (Dig Sol) 45
- Superbase 64 49
- Superbase 128 55
- Superscript 128 49
- ThoughtForm 64 (Gallery) 26
- Vizistar or Viziwrite 128 65
- Wordpro 128/Spell/Filepro 30
- Wordpro 64/Spell/Turbo 30

**PERSONAL**

- Bridgemaster (Radarsoft) 12

- Cardio Exercise (Bodylog) \$69
- Celebrity Cookbook (Merrill) 25
- Classical Music (Strider) 9
- Crossword (Radarsoft) 12
- Disk/Video/Mag Catalogue 128 29
- Dream Analyzer (Merrill) 25
- Enhanced Stress (Bodylog) 199
- Family Tree 128 or 64 (Genco) 39
- Hearthab (Bodylog) 49
- Muscle Development (Bodylog) 54
- Sexual Edge (Merrill) 20
- Standard Stress (Bodylog) 89
- Tempo Typing (Radarsoft) 12

**EDUCATIONAL**

- Fisher Price 17
- Peter Rabbit Reading (3-6) 19
- Peter & Wolf Music (3-7) 19
- Jungle Book Reading (6-9) 19
- First Men on Moon Math (9 +) 19
- Widham Classics Graphic Adven 9
- Alice in Wonderland 9
- Treasure Island (10 +) 9
- Wizard of Oz (10 +) 9
- Swiss Family Robinson (10 +) 9
- Below the Root (10 +) 9
- Hayden Science Imp For SAT  
Math/Verbal or Exams 17
- Spinnaker 10
- Facemaker-Amiga (3-8) 39
- Alphabet Zoo (3-7) 18
- Kids on Keys (4-9) 18
- Math Busters (8-14) 22
- Kidwriter (6-10) 22
- Homework Helper Math (10 +) 29
- Homework Helper Write (10 +) 29
- Early Learning Friends (3-8) 6
- Grandma's House 6
- Educational Videos-Spinnaker 29
- Readers of Lost Alpha (5-8) 12
- Adventures of Time Taxi (5-8) 12
- Search for Stolen Sentence 12
- Close Encounters of Math Kind 12
- Captain Kangaroo Videos 49
- Right Thing To Do (3-8) 9
- Favorite Adventures (3-8) 9
- Tales From Mother Goose (3-8) 9
- Silly Stories/Scary Tales (3-8) 9
- Beat The SAT - Verbal Video 18
- Beat The SAT - Math Video 18

**AMIGA**

- Analyze 2.0 (Brown W) 119
- CLI-Mate (Progress) 30
- Express Paint (PAR) 60
- FACC (ASDG) 29
- P.H.A.S.A.R. (Finally) 79
- Microlawyer (Progress) 45

- Pagesetter (Gold Disk) \$119
- Gold Spell or Lazer Script 35
- Printmaster Plus (Brown W) 39
- Publisher 1000 (NE Soft) 149
- Logistix (Progress) 119
- Scribble (Brown W) 79
- Talking Coloring Book (JMH) 24
- Superbase (Progress) 119
- TV Text (Brown W) 79
- Videoscape (Aegis) 159
- Wordperfect 299
- Draw (Aegis) 99
- Digit (Aegis) 64
- Viziwrite (Progress) 119
- Amiga 500-512 Exp Boards 139

**BRIWALL**

Solid Products • Solid Support

P.O. Box 129/56 Noble St.  
Kutztown, PA 19530

**TOLL-FREE 24 HOURS**  
**1-800-638-5757**  
 (ORDERS ONLY PLEASE)

**OUR PROMISE**

**WE GUARANTEE YOUR SATISFACTION!!**  
 If, for any reason, you are not satisfied with your selection within 15 days of your receipt, simply return the product to us for a friendly refund of your purchase price. No hassles! You pay ONLY \$1.00 per returned item for handling. Defective items are replaced free of charge!

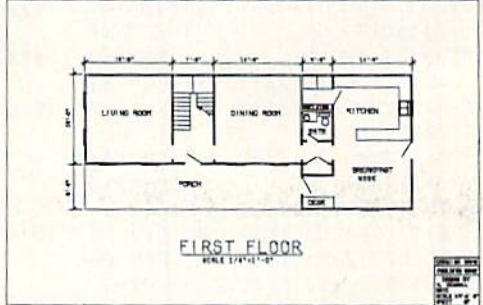
**!! FREE !!**  
 Strider's  
 Computer Classics  
 with order totaling  
**\$100 or more.**

**\* PRODUCT OF THE MONTH!!**

**HOME DESIGNER 128**

! THE ONLY PERSONAL CAD SYSTEM YOU'LL EVER NEED !

LIST - \$50    OURS - \$45    SPECIAL - \$39\*



Home Designer is the ONLY object-based CAD package available for your C128. This gives YOU near-plotter resolution on your dot-matrix printer. Print accurate drawings in ANY scale! With over 50 powerful commands, 5 drawing layers, mouse support, library figures and much more, this package is perfect for house plans, schematics, engineering and virtually any application requiring precise detail.

**DEALER INQUIRIES WELCOME**

\* OFFER GOOD UNTIL 11/30/87

ORDERING INSTRUCTIONS: VISA, MasterCard, Personal Check, Money Order or COD are welcome. Shipping USA: \$3.00/ground, \$5.00/2nd Day, \$14.00/overnight, C.O.D. add \$2.00. Canada/Mexico: \$6.00 Air Mail. Foreign: \$12.00 (for Air Mail use charge & specify maximum). PA residents add 6% sales tax. Include phone number and computer/driver model with order. All items will be shipped immediately. (if we are out-of-stock, we will let you know.) Charge is per order.

For CUSTOMER SERVICE please call us:  
 Monday thru Friday, 9:30 a.m. - 4 p.m. EST  
 1 - (215) - 683 - 5699

Call or write for our FREE CATALOG,  
 describing in detail, hundreds of  
 fine products for your Commodore.



# E A S Y   A P P L I C A T I O N S

```

SPC(3)"PRESS (CTRL 9)FIRE(C
TRL 0) TO MOVE TO NEXT PROB
LEM
:REM*45
390 PRINTSPC(3)"{CRSR DN}MOVE J
OYTICK (CTRL 9)UP{CTRL 0} F
OR ANSWER
:REM*139
400 FORT=1TO2000:NEXT
410 :
:REM*131
420 TI$="000000"
:REM*147
430 ONT1GOSUB1070,1120,1180,123
0,1290
:REM*139
440 ONT2GOSUB620,740,870,990
:REM*147
450 FB=PEEK(56320)AND16:FR=15-(
PEEK(56320)AND15)
:REM*45
460 IFR=1THENGOSUB1390
:REM*83
470 IFVAL(TI$)>TMTHEN540
:REM*51
480 IFFB<>0THEN450
:REM*197
490 NP=NP+1:GOSUB1330
:REM*19
500 IFFLTHENNP=NP-1
:REM*203
510 FL=0
:REM*173
520 IFVAL(TI$)<TMTHEN430
:REM*8
530 :
:REM*252
540 PRINT"{SHFT CLR}{CTRL 9}{CT
RL 5}{14 SPACES}FLASH CARDS
{15 SPACES}"
:REM*68
550 PRINT"{2 CRSR DNs}{CTRL 2}"
SPC(11)"TIME:""TM/100""{CRSR
LF}:00 MIN"
:REM*150
560 PRINTSPC(5)"# PROBLEMS:{2 S
PACES}"NP
:REM*214
570 PRINTSPC(5)"{2 CRSR DNs}PLA
Y AGAIN [Y/N]
:REM*34
580 GETK$:IFK$=""THEN580
:REM*162
590 IFK$="Y"THENRUN
:REM*64
600 SYS2048:END
:REM*156
610 :
:REM*76
620 PRINT"{SHFT CLR}{CTRL 9}{CO
MD 7}{9 SPACES}FLASH CARDS:
ADDITION{10 SPACES}{2 CRSR
DNs}{CTRL 3}"
:REM*194
630 FORI=1TO5:PRINTSPC(18)A$(X,
I):NEXT
:REM*2000
640 PRINT:PRINT
:REM*84
650 PRINTSPC(18)A$(Y,1):REM*164
660 PRINTSPC(18)A$(Y,2):REM*190
670 PRINTSPC(13)"{CTRL 9}{CTRL
2}{CTRL 3}{CTRL 0}";SPC(4)
;A$(Y,3)
:REM*212
680 PRINTSPC(12)"{CTRL 9}{CTRL
2}{3 SPACES}{CTRL 3}{CTRL 0}
";SPC(3);A$(Y,4)
:REM*60
690 PRINTSPC(13)"{CTRL 9}{CTRL
2}{CTRL 3}{CTRL 0}";SPC(4)
;A$(Y,5)
:REM*234
700 PRINT
:REM*36
710 PRINTSPC(12)"{CTRL 9}{CTRL
2}{11 SPACES}"
:REM*254
720 RETURN
:REM*12
730 :
:REM*196
740 PRINT"{SHFT CLR}{CTRL 9}{CO
MD 6}{8 SPACES}FLASH CARDS:
SUBTRACTION{8 SPACES}{2 CR
SR DNs}{CTRL 3}"
:REM*4
750 IFL=1THENFORI=1TO5:PRINTSPC
(18)A$(Z,I):NEXT
:REM*72
760 IFL=2THENFORI=1TO5:PRINTSPC
(11)A$(Z,I)SPC(2)"{CTRL 0}
"A$(Z,I):NEXT
:REM*188
770 PRINT:PRINT
:REM*215
780 PRINTSPC(18)A$(Y,1)
:REM*39
790 PRINTSPC(18)A$(Y,2)
:REM*65
800 PRINTSPC(18)A$(Y,3)
:REM*91
810 PRINTSPC(11)"{CTRL 9}{CTRL
2}{3 SPACES}{CTRL 3}{CTRL 0}
";SPC(4);A$(Y,4)
:REM*163
820 PRINTSPC(18)A$(Y,5):REM*143
830 PRINT
:REM*167
840 PRINTSPC(10)"{CTRL 9}{CTRL
2}{13 SPACES}"
:REM*27
850 RETURN
:REM*143
860 :
:REM*71
870 PRINT"{SHFT CLR}{CTRL 9}{CT
RL 4}{7 SPACES}FLASH CARDS:
MULTIPLICATION{6 SPACES}{2
CRSR DNs}{CTRL 3}"
:REM*151
880 FORI=1TO5:PRINTSPC(18)A$(X,
I):NEXT
:REM*195
890 PRINT:PRINT
:REM*79
900 PRINTSPC(18)A$(Y,1):REM*159
910 PRINTSPC(18)A$(Y,2):REM*185
920 PRINTSPC(12)"{CTRL 9}{CTRL
2}{CRSR RT}{CTRL 3}{CTRL
0}";SPC(3);A$(Y,3)
:REM*15
930 PRINTSPC(12)"{CTRL 9}{CTRL
2}{CRSR RT}{CRSR RT}{CTRL
3}{CTRL 0}";SPC(3);A$(Y,4)
:REM*251
940 PRINTSPC(12)"{CTRL 9}{CTRL
2}{CRSR RT}{CTRL 3}{CTRL
0}";SPC(3);A$(Y,5)
:REM*43
950 PRINT
:REM*31
960 PRINTSPC(12)"{CTRL 9}{CTRL
2}{11 SPACES}"
:REM*249
970 RETURN
:REM*7
980 :
:REM*191
990 PRINT"{SHFT CLR}{CTRL 9}{CT
RL 8}{9 SPACES}FLASH CARDS:
DIVISION{10 SPACES}{5 CRSR
DNs}{CTRL 3}"
:REM*19
1000 PRINTSPC(16)"{CTRL 9}{CTRL
2}{15 SPACES}"
:REM*221
1010 PRINTSPC(16)"{CTRL 9}{CTR
L 3}"
:REM*155
1020 IFL=1THENFORI=1TO5:PRINTSP
C(9)A$(X,I);"{CTRL 9}{CTRL
2}{2 CRSR RTs}{2 CRSR RT
s}{CTRL 0}{CTRL 3}";A$(Z,I
):NEXT
:REM*47
1030 IFL=2THENFORI=1TO5:PRINTSP
C(9)A$(X,I);"{CTRL 9}{CTRL
2}{2 CRSR RTs}{2 CRSR RT
s}{CTRL 0}{CTRL 3}"A$(Z1,I
)"{CTRL 0} "A$(Z2,I):NEXT
:REM*128
1040 PRINTSPC(16)"{CTRL 9}{CTRL
2} "
:REM*148
1050 RETURN
:REM*88
1060 :
:REM*16
1070 X=INT(RND(1)*10)
:REM*120
1080 Y=INT(RND(1)*(R2-R1))+R1
:REM*94
1090 Z=X+Y
:REM*120
1100 RETURN
:REM*138
1110 :
:REM*66
1120 X=INT(RND(1)*10)
:REM*170
1130 Y=INT(RND(1)*(R2-R1))+R1
:REM*144
1140 Z=X+Y:Z$=STR$(Z):L=LEN(MID
$(Z$,2))
:REM*108
1150 IFL=2THENZ1=VAL(LEFT$(Z$,2
)):Z2=VAL(RIGHT$(Z$,1))
:REM*230
1160 RETURN
:REM*198
1170 :
:REM*126
1180 X=INT(RND(1)*10)
:REM*230
1190 Y=INT(RND(1)*(R2-R1))+R1
:REM*204
1200 Z=X*Y
:REM*38
1210 RETURN
:REM*248
1220 :
:REM*176
1230 X=INT(RND(1)*(R2-R1))+R1:I
FX=0THEN1230
:REM*62
1240 Y=INT(RND(1)*10)
:REM*38
1250 Z=X*Y:Z$=STR$(Z):L=LEN(MID
$(Z$,2))
:REM*26
1260 IFL=2THENZ1=VAL(LEFT$(Z$,2
)):Z2=VAL(RIGHT$(Z$,1))
:REM*84
1270 RETURN
:REM*52
1280 :
:REM*237
1290 T2=INT(RND(1)*4)+1:REM*253
1300 ONT2GOSUB1070,1120,1180,12
30
:REM*189
1310 RETURN
:REM*93
1320 :
:REM*21
1330 POKES+24,15:POKES+6,240:PO
KES+4,17
:REM*241
1340 POKES+1,25:POKES,177
:REM*35
1350 FORT=1TO20:NEXT
:REM*55
1360 POKES+4,16
:REM*87
1370 RETURN
:REM*153
1380 :
:REM*81
1390 PRINT"{HOME}{CTRL 2}{21 CR
SR DNs}"SPC(12)"ANSWER:";
:REM*163
1400 IFT2=1THENPRINTZ
:REM*53
1410 IFT2=2THENPRINTX
:REM*123
1420 IFT2=3THENPRINTZ
:REM*201
1430 IFT2=4THENPRINTY
:REM*19
1440 FL=1:RETURN
:REM*73
1450 :
:REM*151
1460 PRINT"{3 CRSR DNs}DIVISION
BY ZERO NOT ALLOWED."
:REM*141
1470 PRINT"PLEASE START OVER BY
PRESSING ANY KEY."
:REM*35
1480 GETK$:IFK$=""THEN1480
:REM*221
1490 RUN
:REM*1
1500 :
:REM*201
1510 DATA "{CTRL 9}{5 SPACES}"
:REM*49
1520 DATA "{CTRL 9} {3 CRSR RTs
}"
:REM*247
1530 DATA "{CTRL 9} {3 CRSR RTs
}"
:REM*1
1540 DATA "{CTRL 9} {3 CRSR RTs
}"
:REM*12
1550 DATA "{CTRL 9}{5 SPACES}"
:REM*90
1560 :
:REM*6
1570 DATA "{CTRL 9}{2 CRSR RTs}
{2 SPACES}{CRSR RT}"
:REM*72

```



```

1580 DATA "{CTRL 9}{2 CRSR RTs}
      {2 SPACES}{CRSR RT}"
      :REM*82
1590 DATA "{CTRL 9}{2 CRSR RTs}
      {2 SPACES}{CRSR RT}"
      :REM*92
1600 DATA "{CTRL 9}{2 CRSR RTs}
      {2 SPACES}{CRSR RT}"
      :REM*102
1610 DATA "{CTRL 9}{2 CRSR RTs}
      {2 SPACES}{CRSR RT}"
      :REM*112
1620 :
      :REM*66
1630 DATA "{CTRL 9}{5 SPACES}"
      :REM*170
1640 DATA "{CTRL 9}{4 CRSR RTs}
      "
      :REM*16
1650 DATA "{CTRL 9}{5 SPACES}"
      :REM*190
1660 DATA "{CTRL 9} {4 CRSR RTs}
      )"
      :REM*126
1670 DATA "{CTRL 9}{5 SPACES}"
      :REM*210
1680 :
      :REM*126
1690 DATA "{CTRL 9}{5 SPACES}"
      :REM*230
1700 DATA "{CTRL 9}{4 CRSR RTs}
      "
      :REM*76
1710 DATA "{CTRL 9}{2 CRSR RTs}
      {3 SPACES}"
      :REM*218
1720 DATA "{CTRL 9}{4 CRSR RTs}
      "
      :REM*96
1730 DATA "{CTRL 9}{5 SPACES}"
      :REM*14
1740 :
      :REM*186
1750 DATA "{CTRL 9} {2 CRSR RTs}
      } {CRSR RT}"
      :REM*218
1760 DATA "{CTRL 9} {2 CRSR RTs}
      } {CRSR RT}"
      :REM*228
1770 DATA "{CTRL 9}{5 SPACES}"
      :REM*54
1780 DATA "{CTRL 9}{3 CRSR RTs}
      {CRSR RT}"
      :REM*152
1790 DATA "{CTRL 9}{3 CRSR RTs}
      {CRSR RT}"
      :REM*162
1800 :
      :REM*247
1810 DATA "{CTRL 9}{5 SPACES}"
      :REM*95
1820 DATA "{CTRL 9} {4 CRSR RTs}
      )"
      :REM*31
1830 DATA "{CTRL 9}{5 SPACES}"
      :REM*115
1840 DATA "{CTRL 9}{4 CRSR RTs}
      "
      :REM*217
1850 DATA "{CTRL 9}{5 SPACES}"
      :REM*135
1860 :
      :REM*51
1870 DATA "{CTRL 9}{5 SPACES}"
      :REM*155
1880 DATA "{CTRL 9} {4 CRSR RTs}
      )"
      :REM*91
1890 DATA "{CTRL 9}{5 SPACES}"
      :REM*175
1900 DATA "{CTRL 9} {3 CRSR RTs}
      )"
      :REM*117
1910 DATA "{CTRL 9}{5 SPACES}"
      :REM*195
1920 :
      :REM*111
1930 DATA "{CTRL 9}{5 SPACES}"
      :REM*215
1940 DATA "{CTRL 9}{3 CRSR RTs}
      {SHFT LB.}"
      :REM*201
1950 DATA "{CTRL 9}{2 CRSR RTs}
      {SHFT LB.} {CTRL 0}{SHFT L
      B.}"
      :REM*165
1960 DATA "{CTRL 9}{CRSR RT}{SH
      FT LB.} {CTRL 0}{SHFT LB.}
      "
      :REM*135
1970 DATA "{CTRL 9}{CRSR RT}{2
      SPACES}{2 CRSR RTs}"
      :REM*151
1980 :
      :REM*171
1990 DATA "{CTRL 9}{5 SPACES}"
      :REM*19
2000 DATA "{CTRL 9} {3 CRSR RTs}
      )"
      :REM*217
2010 DATA "{CTRL 9}{5 SPACES}"
      :REM*39
2020 DATA "{CTRL 9} {3 CRSR RTs}
      )"
      :REM*237
2030 DATA "{CTRL 9}{5 SPACES}"
      :REM*59
2040 :
      :REM*231
2050 DATA "{CTRL 9}{5 SPACES}"
      :REM*80
2060 DATA "{CTRL 9} {3 CRSR RTs}
      )"
      :REM*22
2070 DATA "{CTRL 9}{5 SPACES}"
      :REM*100
2080 DATA "{CTRL 9}{4 CRSR RTs}
      "
      :REM*202
2090 DATA "{CTRL 9}{5 SPACES}"
      :REM*120

```

# The Menu Machine

*With these instant menu routines, you can concentrate on writing the important parts of your program.*

By E. E. ELLIOTT

I wrote The Menu Machine to circumvent the problem of coding menu routines. It will take over this uninspiring part of programming for you and create impressive menus for your programs.

Each menu created with The Menu Machine appears inside a border that's sized for that menu, and the entire display is centered on the screen. You make your choices by pressing the cursor-down key until the desired selection is highlighted and then hitting the return key.

Three limitations apply when you're using The Menu Machine. First, you can

include no more than eight items in each menu, although you can chain together a number of menus to effectively have more than eight choices. Second, you can't use line numbers from 20000 to 20250 elsewhere in your program unless you renumber the menu routine created by The Menu Machine. Finally, the menu routine uses the following variable names: RE, LE, TP, M, I, PL, S, K\$, C, R, T, TL\$, TR\$, ME\$(0)-ME\$(8), BL\$, BR\$, VR\$ and HZ\$. If you use these names elsewhere in your program, you must be sure to reset their values after exiting from the menu routine.

You'll find it helpful to finish writing

your main program before creating your menu routine, because you'll need to know where each menu choice branches to in the program. As you're creating the menu routine, you must enter line numbers (target lines) where execution will go after each menu selection is made.

## ENTERING MENU INFORMATION

When you run the first Menu program (Listing 1), it first asks you to enter the number of items, from one to eight, that you want the menu to have. For a sample menu, enter 4 and press the return key.

Then you must type in the title of your menu. Enter any title up to 30 characters long.

Next, you're prompted for the text of the first menu item. For your sample, enter SELECTION 1 and press return. You are then asked for the target line number that the program should jump to when this menu item is chosen. Enter 1000. Prompts for name and target line continue through all the menu items. Enter the following information for the choices two through four:



# EASY APPLICATIONS

SELECTION 2, 2000  
SELECTION 3, 3000  
SELECTION 4, 4000

After you've completed the fourth entry, information begins flashing on the screen as the program creates your menu routine.

Now clear the memory, load in the second program (Listing 2) and save it to the work disk containing the menu routine that program 1 created. Finally, load in the third program (Listing 3) and then save it to the same work disk.

## PUTTING IT ALL TOGETHER

Now you're ready to watch The Menu Machine do its stuff. First, make sure that the work disk containing all three programs is in your disk drive. Then load in and run program 3 to append program 2 to the menu routine created by program 1. A prompt will appear asking Program to Append? Enter the filename of program 2 and press the return key. At the next prompt, specify your drive number.

When you see the cursor again, enter RUN and press the return key. At the first prompt, type in the filename of the menu routine you created with program 1 and press return. Once again, enter the device number and press return.

Finally, list the appended program and delete lines 1-6. Save the finished program to disk, and there you have it! A lean, mean, menu-driven machine.

When the menu routines are used in a program that requires information to be formatted on the screen, you can position your cursor anywhere by setting C equal to the column number and R equal to the row number. Then use a GOSUB 20240 to execute this feature.

### ► RUN it right: C-64

#### Listing 1. Menu program 1.

```

100 POKES3280,6:POKES3281,6:POK
E646,7:Q$=CHR$(34) :REM*50
110 LI$="{CRSR DN}{29 SHFT Es}{
UP ARROW}(30){34 CRSR LFs}{
CRSR UP} :REM*244
120 PRINT"{SHFT CLR}{2 CRSR DNs
}ENTER NUMBER OF MENU ITEMS
(1-8) : " :REM*56
130 GETZ$:IFZ$<"1"ORZ$>"8"THEN1
30 :REM*94
140 PRINTZ$:I=VAL(Z$):TP=INT((2
4-2*I)/2-1):BM=TP+2*I+2
:REM*68
150 PRINT"{2 CRSR DNs}{CTRL 9)E
NTER MENU TITLE":PRINTLI$;:
GOSUB290:ME$(0)=IN$ :REM*72
160 FORT=1TOI:PRINT"{2 CRSR DNs
}{CTRL 9)ENTER MENU ITEM"IT"
{CRSR DN}":PRINTLI$;:GOSUB2

```

```

90:ME$(T)=IN$ :REM*220
170 PRINT"{CRSR DN}{CTRL 9)JUMP
S TO LINE NUMBER -":GOSUB2
90:LO(T)=VAL(IN$) :REM*0
180 TL=LEN(ME$(T))+2:IFTL>PLTHE
NPL=TL :REM*52
190 NEXT:RE=INT((40-PL)/2-1):LE
=RE+PL+1 :REM*146
200 PRINT"{SHFT CLR}200000 RE=";
RE;" :LE=";LE;" :TP=";TP;" :BM
=";BM;" :I=";I;" :PL=";PL
:REM*14
210 FORT=0TOISTEP2:PRINT20010+(
10*T);"ME$(T);"="Q$;ME$(T
);Q$ :REM*238
220 IFME$(T+1)=""THENPRINT:GOTO
240 :REM*158
230 PRINT":ME$(T+1);"="Q$;ME$(
T+1);Q$:NEXT :REM*126
240 A$="":FORT=1TOI-1:A$=A$+STR
$(LO(T))+":NEXT:A$=A$+STR
$(LO(I)) :REM*234
250 PRINT"20230 ONTOTO";A$
:REM*218
260 T=INT(I/2+.5)+4 :REM*87
270 POKE198,T+1:POKE631,19:FORI
=1TOT:POKE631+I,13:NEXT
:REM*153
280 PRINT"GOTO 360":END :REM*23
290 IN$="":ZQ$=CHR$(166)+CHR$(1
57):PRINTZQ$ :REM*195
300 GETZ$:IFZ$=""THEN300:REM*71
310 Z=ASC(Z$):IFZ=13THENPRINT"
":RETURN :REM*199
320 IFIN$<>""THENIFZ=20THENPRIN
TZ$;ZQ$;:IN$=LEFT$(IN$,LEN(
IN$)-1):GOTO300 :REM*129
330 IFZ=20THEN300 :REM*241
340 IFLEN(IN$)=30THEN300
:REM*213
350 PRINTZ$;ZQ$;:IN$=IN$+Z$:GOT
O300 :REM*43
360 T=90 :REM*235
370 PRINT"{SHFT CLR}"T:PRINT"T=
"T+10;:IFT<370THENPRINT":GO
TO370" :REM*107
380 IFT=370THENPRINT"{SHFT CLR}
370":PRINT"380":PRINT"GOTO
400" :REM*157
390 POKE198,4:POKE631,19:FORT=6
32TO634:POKET,13:NEXT:END
:REM*207
400 PRINT"{SHFT CLR}{6 CRSR DNs
}YOUR MENU MAY NOW BE SAVED
." :K$=CHR$(13):PRINT"(HOME)
{CTRL 7}390"K$"400" :REM*53
410 PRINT"410"K$"420" :REM*11
420 POKE198,6:POKE631,19:FORT=6
32TO635:POKET,13:NEXT:POKE
36,158:END :REM*235
20100 K$=CHR$(13):PRINT"{SHFT C
LR}{CRSR DN}";TAB(20-LEN
(ME$(0)/2));" {CTRL 9}";M
E$(0) :REM*242
20110 C=RE+2:R=TP+2:FORT=1TOI:G
OSUB20240:TL$=CHR$(213):T
R$=CHR$(201) :REM*142
20120 PRINTME$(T):R=R+2:NEXT:BL
S$=CHR$(202):BR$=CHR$(203)
:VR$=CHR$(221) :REM*174
20130 HZ$=CHR$(192):R=BM+2:C=5:
GOSUB20240:PRINT"MAKE CHO
ICE AND PRESS <RETURN>
:REM*196
20140 C=RE:R=TP:GOSUB20240:PRIN
TTL$;:FORT=1TOPL:PRINTHZ$
;:NEXT:PRINTTR$ :REM*14
20150 FORR=TP+1TOBM-1:GOSUB2024
0:PRINTVR$;TAB(LE);VR$:NE
XT :REM*54
20160 R=BM:GOSUB20240:PRINTBL$;
:FORT=1TOPL:PRINTHZ$;:NEX
T:PRINTBR$ :REM*192
20170 C=RE+2:R=TP+2:T=1 :REM*28
20180 GOSUB20240:PRINT"{CTRL 9}
"ME$(T) :REM*132
20190 GETZ$:IFZ$<>CHR$(17)ANDZ$
<>K$THEN20190 :REM*210
20200 IFZ$=K$THEN20230 :REM*74
20210 IFT=ITHENGOSUB20240:PRINT
ME$(T):GOTO20170 :REM*128
20220 GOSUB20240:PRINTME$(T):T=
T+1:R=R+2:GOTO20180
:REM*134
20240 POKE211,C:POKE214,R:SYS58
732:REM POSITION CURSOR
:REM*227
20250 RETURN :REM*163
Listing 2. Menu program 2.
999 RUN200000 :REM*212
1000 PRINT"{SHFT CLR}CONGRATULA
TIONS! YOUR PROGRAM WORKS
:REM*151
1001 PRINT"PROPERLY!" :REM*236
1002 FOR T=1TO20000:NEXT:RUN20000
0 :REM*75
2000 POKES3281,1 :REM*141
2001 PRINT"{SHFT CLR}{CTRL 8)TH
IS IS MENU SELECTION #2":G
OTO5000 :REM*174
3000 POKES3281,7 :REM*133
3001 PRINT"{SHFT CLR}{CTRL 2)TH
IS IS MENU SELECTION #3":G
OTO5000 :REM*166
4000 POKES3281,5 :REM*109
4001 PRINT"{SHFT CLR}{COMD 8)TH
IS IS MENU SELECTION #4":G
OTO5000 :REM*168
5000 FORT=1TO2500:NEXT:POKE 532
81,0:RUN20000 :REM*103
Listing 3. Menu program 3.
1 INPUT"PROGRAM TO APPEND";A$:I
NPUT"(5 SPACES)DRIVE 8 OR 9";
U:REM C-64 & VIC-20:REM*117
2 A=PEEK(44):PRINT"{SHFT CLR}{3
CRSR DNs)LOAD";CHR$(34);A$;C
HR$(34);CHR$(44);U :REM*208
3 PRINT"{4 CRSR DNs)POKE43,1:PO
KE44,";A;" {HOME}" :REM*3
4 POKE632,13:POKE633,13:POKE634
,13:POKE198,3 :REM*16
5 IFPEEK(45)<2THENPOKE43,PEEK(4
5)-2+255:POKE44,PEEK(46)-1:EN
D :REM*11
6 POKE43,PEEK(45)-2:POKE44,PEEK
(46):END :REM*92

```



# Mega-Magic

Easy-to-Use Subroutines and Utilities

## SCROLL LEFT, SCROLL RIGHT

Scroller is a brief machine-language routine that turns your display into a continuous band running in either direction across the screen. Type in and run Scroller Basic (Listing 1). It automatically saves to disk a machine-language program file called SCROLLERMLA.

To access SCROLLERMLA, type in SYS828. The entire screen will move one column to the left. Type in SYS892 and it'll shoot back to where it started. You can scroll any text screen endlessly this way, using a continuous loop such as: 10 SYS892:GOTO10. If you write a program with a series of Data statements to be printed vertically on the left margin of the screen, SCROLLERMLA will scroll a message as long as the available memory in your computer.

Random Scroller (Listing 2) demonstrates a potentially valuable feature of this scrolling program. By typing lines 30-70 into your program (perhaps as a subroutine) and setting the variables to appropriate values, you can scroll any section of the screen in either direction. Set T equal to the number (0-23) of the top screen line of the section to be scrolled, B to the number (1-24) of the bottom line of the section, R to the right margin and L to the left margin.

Load and run Random Scroller to see what I mean. Enter your own values for T, B, R and L. See if you can scroll different sections of the display in opposite directions at the same time. Experiment and have fun. One note of caution, however: Scrolling lines beyond line 24 will certainly Oosterize your Basic program, and setting T to a value greater than B is likely to crash the computer.

—ROBERT BIXBY, KALAMAZOO, MI

## ► RUN it right: C-64

### Listing 1. Scroller Basic program.

```
10 PRINT"(SHFT CLR)SCROLLER":FORI=828TO938STEP10:FOR
  A=0TO9:READB:C=C+B:POKEI+A,B :REM*132
20 IFF=0THENF=1:G=G+B:GOTO30:IFF=1THENF=0:H=H+B
  :REM*250
30 NEXT:E=E+C :REM*144
40 READD:IFC<>DTHENPRINT"ERROR IN DATA STATEMENT "I"
  (CRSR LF).":END :REM*124
50 C=0:NEXTI :REM*102
60 PRINT"SAVING ML":GOTO190:END :REM*170
70 DATA 160,0,169,0,133,251,169,4,133,252,1271
  :REM*130
80 DATA 177,251,141,253,3,165,251,201,232,240,1914
  :REM*182
90 DATA 42,200,177,251,136,145,251,200,192,39,1633
  :REM*80
100 DATA 144,245,173,253,3,145,251,160,0,32,1406
  :REM*56
110 DATA 105,3,76,70,3,165,251,24,105,40,842 :REM*24
120 DATA 133,251,176,1,96,165,252,24,105,1,1204
  :REM*62
130 DATA 133,252,96,96,160,39,169,0,133,251,1329
  :REM*44
140 DATA 169,4,133,252,165,251,201,232,240,239,1886
```

```
150 DATA 177,251,141,253,3,136,177,251,200,145,1734
  :REM*130
160 DATA 251,136,192,0,240,3,76,145,3,173,1219
  :REM*168
170 DATA 253,3,145,251,160,39,32,105,3,76,1067
  :REM*78
180 DATA 134,3,0,0,0,0,0,0,0,137 :REM*20
190 OPEN15,8,15,"S:SCROLLERMLA" :REM*56
200 OPEN1,0,1,"0:SCROLLERMLA,P,W":PRINT#1,CHR$(60)CHR
  R$(3); :REM*220
210 RESTORE:FORI=828TO947:PRINT#1,CHR$(PEEK(I));:NEX
  T :REM*130
220 CLOSE1:INPUT#15,A$,B$,C$,D$:PRINTA$,B$:CLOSE15:E
  ND :REM*16
```

### Listing 2. Random Scroller program.

```
1 REM RANDOM SCROLLER DEMO :REM*127
5 FORI=0TO26:PRINT"(CTRL 2){COMD @}{COMD P}{COMD I}{
  SHFT F}{SHFT C}{SHFT D}{SHFT C}{SHFT F}{COMD O}{CO
  MD P}{COMD @}{COMD P}{COMD O}{SHFT F}{SHFT C}{SHFT
  D}{SHFT C}{SHFT F}{COMD I}{COMD P}{COMD @}{COMD P
  }{COMD I}{SHFT F}{SHFT C}{SHFT D}{SHFT C}{SHFT F}{
  COMD I}{COMD O}{COMD P}{COMD @}{COMD O}{SHFT C}{SH
  FT D}{SHFT C}{COMD O}";:NEXT :REM*47
10 T=0:B=25:L=0:R=39:N=RND(TI):IFN<.5THENGO200
  :REM*60
20 T=1024+T*40:T=T/256:POKE835,T:POKE899,T:T=(T-INT(
  T))*256:POKE831,T:POKE895,T :REM*230
30 B=1024+B*40:B=(B/256-INT(B/256))*256:POKE846,B:PO
  KE905,B:POKE829,L:POKE866,L :REM*184
40 POKE921,L:POKE857,R:POKE893,R:POKE933,R:GOSUB100:
  GOTO10 :REM*110
100 FORI=0TOM:SYS828:NEXT:FORI=0TOM:SYS892:NEXT:RETU
  RN :REM*180
200 T=INT(RND(TI)*12):B=INT(RND(TI)*12+12):M=INT(RND
  (TI)*100)+1 :REM*250
210 L=INT(RND(TI)*19):R=INT(RND(TI)*19+20):RETURN
  :REM*216
```

## ERROR CHANNEL MONITOR

This vector-driven utility monitors the status of your disk drive's error channel and displays that status on the top line of the screen. It's written for a C-64 with a disk drive.

A vector is a program pointer that resides in a certain location in memory. It stores the two-byte address of another memory location to which a program should jump. It can also include a JMP instruction, for a total of three bytes.

Basic 2.0 contains many vectors in RAM for use as programs run. You can intercept execution and divert it to other assignments by altering these vectors. In this case, the program changes the vector at addresses \$302 and \$303 (decimal 770 and 771), which usually points to address \$A483, to point to address \$C000 (decimal 49152), which is where Error Channel Monitor resides.

To use Error Channel Monitor, type it in and save it to disk. *Don't* run it before you save it, because it erases itself when it runs. If you've typed in the listing correctly, when you do run it, the screen will clear, the top line will display ►



# MEGA - MAGIC

the error-channel status, and the word "Activated" will appear.

Error Channel Monitor will continue to monitor and display the disk drive's error-channel status as long as the computer and disk drive are both on. It won't interfere with most Basic programs, so you can use it when you're writing and debugging your own programs.

—SCOTT M. HUSE AND WILLIAM D. TAYLOR  
SALISBURY CENTER, NY

## ► RUN it right: C-64; disk drive

### Listing 1. Error Channel Monitor program.

```

100 REM ERROR CHANNEL BY SMH & WDT :REM*72
130 FORL=49152TO49263:READD:POKEL,D
                                     :REM*178
140 CK=CK+D:NEXT                     :REM*114
150 IFCK<>14986THENPRINT"ERROR":END
                                     :REM*108
160 SYS49152:PRINT" {SHFT CLR} {CRSR DN}ACTI
    VATED.":NEW                       :REM*60
170 DATA169,011,141,002,003,169    :REM*202
180 DATA192,141,003,003,096,056    :REM*8
190 DATA032,240,255,142,112,192    :REM*208
200 DATA140,113,192,169,019,032    :REM*112
210 DATA210,255,169,018,032,210    :REM*66
220 DATA255,160,039,169,160,153    :REM*110
230 DATA000,004,173,134,002,153    :REM*76
240 DATA000,216,136,208,242,169    :REM*96
250 DATA062,032,210,255,169,015    :REM*152
260 DATA162,008,160,015,032,186    :REM*99
270 DATA255,169,000,032,189,255    :REM*153
280 DATA032,192,255,162,015,032    :REM*135
290 DATA198,255,032,207,255,201    :REM*129
300 DATA013,240,005,032,210,255    :REM*171
310 DATA208,244,174,112,192,172    :REM*103
320 DATA113,192,024,032,240,255    :REM*127
330 DATA169,146,032,210,255,169    :REM*159
340 DATA015,032,195,255,032,204    :REM*255
350 DATA255,076,131,164            :REM*151
    
```

## FAST C-128 HI-RES SCREEN DUMPS

My program contains machine language code that dumps hi-res screens to Star-compatible printers and includes two size options and a reverse video option.

When you save the program, the code will also be saved to disk; when you run it, the ML file is loaded instead of reading the data and poking it into memory. At the Ready prompt, set up your graphics screen and load or draw a picture to print.

Turn on your Printer, poke the column or reverse data (see options below) and use the SYS command for the size printout you want. It takes 3-4 minutes to print an 8½ × 11-inch picture vertically on the page (use SYS 4864) and about a minute to print a picture vertically on a quarter page (use SYS 4867).

You can position smaller pictures with POKE 4883,nc, where nc is the number of columns from the left margin to the bottom of the printed picture. Use a value of 0 to print a picture on the left side, 20 to center the picture and 40 to print the picture on the right side of the page. This Poke only affects pictures smaller than a full page, and it remains

in effect until you change it with another Poke.

Control the Reverse Video option with a Poke to location 4887. If this location contains a zero (the default), the print-out results in pixels turned on as black and those turned off (background) as white. Use POKE 4887,255 to reverse the color of the printed dots. As with the Column Position option, any change remains until you poke a different value.

—JEFFREY K. GOODE, BURLINGTON, CT

## ► RUN it right: C-128; Star-compatible printer.

### Listing 1. Screen Dump program.

```

1 REM C-128 HI-RES SCREEN DUMPS (4X AND 1X)
                                     :REM*131
2 REM BY JEFFREY K. GOODE           :REM*84
3 OPEN 4,8,4,"%4X ML,P,R":CLOSE4:IFLEFT$(DS
    $,2)=""00"THEN BLOAD "%4X ML",B0:NEW
                                     :REM*217
4 FORX=4864TO5386:READ A:POKEX,A    :REM*240
5 C=C+A:NEXT:IFC<>48274 THEN PRINT "ERROR I
    N DATA":END                       :REM*253
6 BSAVE"%4X ML",P4864 TO P5387:NEW  :REM*12
7 DATA 76,38,19,76,135,20,8,65,27,64,27,1,1
    44,75,27,0,200,75,27,0,77,27    :REM*35
8 DATA 32,0,0,0,0,0,0,0,0,0,0,0,1,4,16,64,3
    2,85,20,169,0,141,32,19         :REM*64
9 DATA 169,1,141,31,19,162,3,189,11,19,32,2
    10,255,202,16,247,169,24,141,27 :REM*255
10 DATA 19,169,7,141,28,19,173,27,19,162,64
    ,160,1,32,60,20,162,0,172,22,19 :REM*142
11 DATA 32,42,20,32,15,20,169,8,174,32,19,1
    60,0,32,60,20,166,250,164,251,32:REM*169
12 DATA 15,20,32,42,20,172,28,19,177,250,32
    ,198,19,173,30,19,77,23,19,32  :REM*100
13 DATA 210,255,32,210,255,206,28,19,16,231
    ,206,27,19,16,180,32,0,21,206,31 :REM*1
14 DATA 19,173,31,19,48,3,76,51,19,173,32,1
    9,201,39,240,6,238,32,19,76,46  :REM*234
15 DATA 19,162,1,189,9,19,32,210,255,202,16
    ,247,32,0,21,169,4,32,195,255,32:REM*195
16 DATA 204,255,165,6,141,0,255,96,174,31,1
    9,240,4,74,74,74,41,15,141,29:REM*118
17 DATA 19,169,1,141,33,19,169,0,141,30,19,
    141,24,19,173,33,19,45,29,19,240 :REM*39
18 DATA 24,174,24,19,189,34,19,141,25,19,17
    3,30,19,13,25,19,14,25,19,13,25 :REM*64
19 DATA 19,141,30,19,14,33,19,238,24,19,173
    ,24,19,201,4,208,211,96,72,138  :REM*199
20 DATA 72,165,250,174,24,19,141,24,19,134,
    250,165,251,174,25,19,141,25,19 :REM*192
21 DATA 134,251,104,170,104,96,134,252,132,
    253,24,165,250,101,252,133,250  :REM*199
22 DATA 165,251,101,253,133,251,96,141,26,1
    9,134,252,132,253,169,0,133,250  :REM*66
23 DATA 133,251,174,26,19,240,6,32,46,20,20
    2,208,250,96,173,0,255,133,6,169 :REM*55
24 DATA 0,141,0,255,169,4,170,168,200,32,18
    6,255,169,0,32,189,255,32,192    :REM*6
25 DATA 255,162,4,32,201,255,144,5,104,104,
    76,170,19,162,4,189,6,19,32,210 :REM*67
26 DATA 255,202,16,247,96,32,85,20,162,2,18
    9,19,19,32,210,255,202,16,247   :REM*186
27 DATA 169,0,141,29,19,162,3,189,15,19,32,
    210,255,202,16,247,169,24,141,27:REM*117
28 DATA 19,169,7,141,28,19,173,27,19,162,64
    ,160,1,32,60,20,162,0,172,22,19 :REM*160
29 DATA 32,42,20,32,15,20,169,8,174,29,19,1
    60,0,32,60,20,166,250,164,251,32 :REM*67
    
```



```

30 DATA 15,20,32,42,20,172,28,19,177,250,77
    ,23,19,32,210,255,206,28,19,16 :REM*84
31 DATA 240,206,27,19,16,189,32,0,21,173,29
    ,19,201,39,240,6,238,29,19,76 :REM*241
32 DATA 154,20,76,170,19,169,13,32,210,255,
    169,10,32,210,255,96 :REM*198
    
```

## ULTRA HI-RES PIE CHARTS

I've added a pie-chart maker routine to *RUN's* Ultra Hi-Res graphics program that appeared in the February and May 1986 issues. UH.Pie Charts works with version 1.1 of Ultra Hi-Res, which includes the @Fill and @HCOPY commands.

To create a pie chart, boot up Ultra Hi-Res V1.1 and load and run the pie chart program. You'll be asked to give your chart a name, the number of sectors you want, the area of each sector as a percent of the circle, and a short description of each sector to print in the legend area. The routine won't fill a sector with a pattern if it occupies an area less than 1.5 percent of the chart, so if you have more than one such sector, you might want to group them into an "other" category.

—CAMERON GOODAIR, KOOLAN ISLAND, W. AUSTRALIA

### ► RUN it right: C-128

#### Listing 1. Ultra Hi-Res Pie Charts program.

```

10 REM ULTRA HIRES PIE CHARTS-CAMERON GOOD
    AIR :REM*100
20 POKE47,0:POKE48,68:CLR :REM*194
30 BANK1:PRINTCHR$(27)"E":PRINT"{SHFT CLR}
    " :REM*48
40 TRAP400:CM$="{23 CRSR DNS}":@TEXT
    :REM*196
50 FAST:PRINTCHR$(27)"U":PRINT"{CRSR DN}{3
    CTRL IS}{CRSR RT}NAME OF PIE CHART"
    :REM*230
60 INPUT"{HOME}{2 CRSR DNS}{5 CTRL IS}{2 C
    RSR RTs}";N$ :REM*58
70 PRINT"{SHFT CLR}"CM$"{3 CTRL IS}MAXIMUM
    OF 22 SECTORS PLEASE" :REM*130
80 INPUT"{HOME}{2 CRSR DNS}{3 CTRL IS}HOW
    MANY SECTORS";N :REM*238
90 IFN>22THENPRINTCHR$(15)"{HOME}"CM$"{3 C
    TRL IS}MAXIMUM OF 22 SECTORS PLEASE"CHR
    $(143):SLEEP5:GOTO70 :REM*66
100 DIMA(N),C$(N),W$(N),H(N),T(N):Q=360:R=
    60:C=2.4:YD=160:RN=57.296 :REM*58
110 PRINT"{SHFT CLR}";H=INT(80/N):V=H*4:C
    G=LEN(N$):CG=CG*8:CN$="{CRSR DN}":CO$=
    "" :REM*126
120 FORI=1TON:PRINT"{3 CTRL IS}PERCENTAGE
    OF SECTOR" I:NEXTI :REM*18
130 PRINT"{HOME}"CM$"{3 CTRL IS}PERCENTAGE
    SO FAR" :REM*98
140 G=O:FORI=1TON:PRINT"{HOME}"CO$;:INPUT"
    {6 CTRL IS}";W$(I):A(I)=VAL(W$(I))
    :REM*128
150 G=G+A(I):PRINT"{HOME}"CM$"{5 CTRL IS}{
    2 CRSR RTs}"G"{CRSR LF}{5 SPACES}";:CO
    $=CO$+CN$:NEXTI :REM*80
160 IFG<>100THENPRINT"{HOME}"CM$CHR$(15)"{
    3 CTRL IS}THE TOTAL MUST = 100%{4 SPAC
    Es}"CHR$(143):SLEEP5:GOTO110 :REM*182
170 PRINT"{SHFT CLR}{2 CTRL IS}{CRSR DN}A
    SHORT DISCRPTION FOR SECTOR" :REM*244
180 PRINT"{HOME}"CM$"{3 CTRL IS}NO MORE TH
    AN"(H-1)"CHARACTERS":PRINT"{HOME}":FOR
    I=1TON :REM*84
190 PRINT"{6 CTRL IS}"I;:INPUT C$(I)
    :REM*128 ►
    
```

## ACTIVATING C-128 KEYS IN C-64 MODE

This program will let you use your C-128's keypad, no-scroll key and cursor keys while running programs in C-64 mode. It works by rewriting the IRQ routine so new keyboard-scan code can be added. The program stores itself at addresses 49152-49454, but, if you're familiar with machine language and have need, you should be able to move it elsewhere with little trouble.

The program activates the no-scroll key by changing the Kernal CHROUT vector to freeze the computer in the IRQ routine when the key is pressed. When you've paused printing, you can press any key to start it again, but I'd suggest using the no-scroll key.

The program may not work with some commercial software, but it should work with any Basic program that doesn't use the same memory addresses.

—JIM BORDEN, CARLISLE, PA

### ► RUN it right: C-128 (in C-64 mode)

#### Listing 1. 128 Keys in 64 Mode program.

```

5 REM 128 KEYPAD IN 64 MODE - JIM BORDEN
    :REM*59
10 FOR X=49152TO49185:READ Z:POKEX,Z:CK=CK+
    Z:NEXT :REM*26
15 FOR X=XTO49285:POKE X,PEEK(X+10770):NEXT
    :REM*9
20 POKE49258,117:POKE49259,192 :REM*78
25 FOR X=XTO49454:READ Z:POKEX,Z:CK=CK+Z:NE
    XT :REM*9
30 IFCK<>26162THENPRINT"ERROR IN DATA LINES
    ...":END :REM*184
35 PRINT"{SHFT CLR} IT'S MAGIC! 128 KEYPAD
    KEYS NOW ACTIVE. " :REM*201
40 PRINT"{3 SPACES}[NO SCROLL] AND CURSOR K
    EYS, TOO.":SYS49152:NEW :REM*2
45 DATA 120,169,23,141,20,3,169,192,141,21,
    3,169,24,141,38,3,169,193,141,39 :REM*13
50 DATA 3,88,96,32,234,255,173,216,192,240,
    3,206,216,192,240,6,32,39,193,76 :REM*48
55 DATA 154,234,168,32,13,193,208,6,142,47,
    208,76,38,235,169,254,141,47,208:REM*101
60 DATA 162,8,72,173,1,220,205,1,220,208,24
    8,74,144,21,200,192,25,208,5,104:REM*208
65 DATA 162,255,208,221,202,208,240,56,104,
    42,141,47,208,208,221,104,185 :REM*65
70 DATA 245,192,170,41,127,160,255,140,47,2
    08,201,1,208,20,32,13,193,208 :REM*48
75 DATA 251,169,0,240,8,173,34,193,73,1,141
    ,34,193,76,148,192,200,217,129 :REM*139
80 DATA 235,208,250,132,203,32,39,193,138,7
    6,228,234,255,56,53,255,50,52,55 :REM*34
85 DATA 49,255,43,45,255,13,54,57,51,255,48
    ,46,145,17,157,29,1,169,0,141,47:REM*103
90 DATA 208,174,1,220,224,255,96,32,202,241
    ,72,169,5,141,216,192,169,0,208 :REM*8
95 DATA 247,104,96,72,169,0,141,34,193,104,
    96 :REM*229
    
```



# MEGA - MAGIC

```

200 IFLEN(C$(I)) > (H-1) THEN PRINT "{HOME}" CM$
CHR$(15) " (3 CTRL Is) NO MORE THAN" (H-1)
"CHARACTERS" CHR$(143): SLEEP5: GOTO180: E
LSE210 : REM*144
210 NEXTI: @GRAPHIC, 0, 2: @CLR, 0 : REM*126
220 @DRAW, 0, 0, 639, 0, 1: @DRAW, 639, 0, 639, 199,
1: @DRAW, 639, 199, 0, 199, 1: @DRAW, 0, 199, 0,
0, 1 : REM*210
230 X=319: Y=88: YR=R: XR=R*C: BANK0 : REM*132
240 PRINT "{HOME}": @CHAR, 53248, (320-CG), 3, 1
, 2, N$ : REM*140
250 @CIRCLE, 1, X, Y, XR, YR : REM*176
260 @DRAW, X, Y, (X+XR), Y, 1: BANK1: T=0: XD=0: S=
0 : REM*77
270 YA=YD+16: X1=0: Y1=0: X9=XR-3: Y9=YR-3
: REM*125
280 FORI=1 TO N: T=((A(I)/100)*360): XA=XD+V
: REM*149
290 S=T+S: IFT<2 THEN S1=S-1: ELSE S1=S-3
: REM*219
300 X1=INT((COS(S/RN)*XR)+.5): Y1=INT((SIN(
S/RN)*YR)+.5) : REM*161
310 XE=X+X1: YE=Y-Y1: XC=X+INT(COS(S1/RN)*X9
): YC=Y-INT(SIN(S1/RN)*Y9) : REM*55
320 BANK0: @DRAW, X, Y, XE, YE, 1: BANK1 : REM*225
330 FORP=1 TO 8: READM(P): NEXTP: BANK0: REM*253
340 @PAINT, XC, YC, 1, M(1), M(2), M(3), M(4), M(5
), M(6), M(7), M(8) : REM*249
350 @BOX, XD, YD, XA, YA, 1: BANK1: XF=XD+1: YF=YD
+1: BANK0 : REM*103
360 @PAINT, XF, YF, 1, M(1), M(2), M(3), M(4), M(5
), M(6), M(7), M(8) : REM*213
370 @CHAR, 53248, XD, 180, 1, 1, C$(I) : REM*155
380 BANK1: XD=XA+V: NEXTI: GETKEY A$: REM*127
390 REM{3 SPACES}@HCOPI, 2, 5 : REM*223
400 @TEXT: HELP: PRINTCHR$(27)"S": PRINTCHR$(
27)"F" : REM*51
410 REM FILL PATTERNS FOLLOW... : REM*39
420 DATA255, 255, 255, 255, 255, 255, 255, 255, 1
28, 192, 224, 240, 248, 252, 254, 255: REM*137
430 DATA024, 024, 024, 255, 255, 024, 024, 024, 2
31, 231, 231, 000, 000, 231, 231, 231: REM*213
440 DATA000, 000, 000, 000, 085, 170, 085, 170, 1
70, 085, 170, 085, 170, 085, 170, 085 : REM*15
450 DATA129, 195, 102, 060, 024, 060, 102, 195, 2
04, 204, 204, 204, 204, 204, 204, 204: REM*183
460 DATA254, 252, 248, 240, 224, 192, 128, 000, 0
80, 160, 080, 160, 080, 160, 080, 160: REM*111
470 DATA003, 006, 012, 024, 048, 096, 192, 128, 2
55, 255, 000, 000, 255, 255, 000, 000 : REM*97
480 DATA252, 249, 243, 231, 207, 159, 063, 127, 0
24, 060, 126, 255, 255, 126, 060, 024: REM*159
490 DATA001, 003, 007, 015, 031, 063, 127, 255, 1
26, 060, 153, 195, 231, 195, 153, 060 : REM*61
500 DATA127, 063, 031, 015, 007, 003, 001, 000, 1
92, 096, 048, 024, 012, 006, 003, 001 : REM*65
510 DATA051, 153, 204, 102, 051, 153, 204, 230, 0
63, 159, 207, 231, 243, 249, 252, 254 : REM*71
520 DATA255, 255, 255, 255, 000, 000, 000, 000, 2
04, 153, 051, 102, 204, 153, 051, 103: REM*46

```

Introducing...

## Super Graphix Gold



Suggested  
Retail  
\$119.95

With specs that out-perform the *Super Graphix Printer Interface*—the industry standard, the *Super Graphix Gold* Printer Interface combines improved speed, features, and memory to satisfy the most demanding user.

- \* 32K Buffer—built-in
- \* 32 printer choices
- \* Supports standard serial from the C-64
- \* Supports fast serial from the 128
- \* 8 switch-selectable operating modes
- \* 16 active DIP switches for unequaled flexibility
- \* RESET and CLEAR buttons
- \* LED indicates activity and errors
- \* 2 built-in screen dumps: 16 sizes, 4 shades, inverse, single and double pass
- \* 4 fonts built-in and 4 downloadable to RAM
- \* Utility disk with more than 40 fonts
- \* Direct-from-disk downloads and dumps
- \* 21 secondary addresses
- \* 12 printing channels
- \* Command channel with more than 35 commands
- \* Banner channel (uses all fonts)
- \* 4 new channels for downloading and printing
- \* All fonts support *underlining*, *italicizing*, *bold-facing*, *super/subscripting* and *9 pitches*
- \* FCC Certified
- \* Lifetime warranty

**XETEC**

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



# C-64 Sprite ML Commands

*This program must be run and installed in memory before you run the Summer or Fall programs that are included on this Special Issue's Calendar insert.*



By LOUIS R. WALLACE

**H**ave you ever tried to use sprites on your C-64, only to find that Basic's Peeks and Pokes were just too slow—or worse yet, too complex to understand? Here's a short machine language utility that will make the use of sprites in your programs easier, faster and more fun.

Once saved and run, the program in Listing 1 adds to Basic several new commands to define, turn on and animate your sprites. The commands and their parameters are:

**HIGH-RESOLUTION SPRITE DEFINE—**  
SYS 49152,sp#,0,c1(0-15),xpan(0-1),  
ypand(0-1)


**MULTICOLOR SPRITE DEFINE—**SYS 49152,sp#,1,c1(0-15),c2(0-15),c3(0-15),  
xpan(0-1),ypand(0-1)

Sp# is the sprite (0-7) that you wish to define or use. C1, C2 and C3 are the various colors that you can use, 1 in hires, 3 in multicolor. Note that *all multicolor sprites share the same color 2 and color 3*. Xpan and ypan are the sprite-expansion flags. Use 0 for no expansion, 1 to expand.

**SPRITE ON/OFF—**SYS 49155,sprite#,(0-1). The Sprite on-and-off routine turns on (1) and off (0) a specified sprite.

**SPRITE MOVE—**SYS 49158,sprite#,  
pointer#,x,y.

Sprite Move will position a given sprite (0-7) at any x (0-512) or y (0-255). In addition, it has the sprite pointer value, which tells the computer where the sprite is in memory. Pointers can be from 0-255, with each pointer equal to the address that corresponds to the pointer\*64.

For examples of the use of these powerful sprite commands, see the *RUN* Special Issue Calendar programs called Summer Celebration and Fall Holidays. They not only employ the new commands, but they will not run unless this machine code program is in memory, so be sure and run this *before* running Summer or Fall! 

## Listing 1. Sprite ML Maker program.

```

10 REM SPRITE ML MAKER FOR C64          93,153,39,208,174,174,193,2      ,45,21,208,141,21,208,76,21
   CALENDAR PRGS.           :REM*58    24,0,208,3,76           :REM*110      ,193,173,171,193      :REM*172
20 REM RUN THIS PRG BEFORE RUNN      150 DATA 112,192,32,145,193,165    250 DATA 13,21,208,141,21,208,9
   ING SUMMER & FALL       :REM*212    ,20,41,15,141,37,208,32,145    6,32,145,193,165,20,41,7,14
30 FOR I=49152 TO 49587:READ A:      193,165,20,41           :REM*60      1,173,193,168        :REM*192
   POKE I,A:NEXT           :REM*106    160 DATA 15,141,38,208,32,145,1    260 DATA 185,155,193,141,171,19
40 PRINT"SPRITE ML INSTALLED FO      93,165,20,41,1,133,20,201,0      3,32,145,193,165,20,141,175
   R THE C64!"             :REM*162    ,208,15,169,255       :REM*230      ,193,172,173,193    :REM*203
50 PRINT"NOW LOAD & RUN THE C64      170 DATA 56,237,171,193,45,29,2    270 DATA 153,248,7,32,145,193,1
   PRGS"                   :REM*230    08,141,29,208,76,149,192,17      65,20,141,176,193,165,21,14
60 PRINT"CALLED SUMMER AND FALL      3,171,193,13,29         :REM*170      1,177,193,32,145    :REM*223
   !"                       :REM*38    180 DATA 208,141,29,208,32,145,    280 DATA 193,165,20,141,178,193
70 END                       :REM*72    193,165,20,41,1,133,20,201,0      ,172,173,193,185,163,193,16
80 REM SPRITE COMMAND ML DATA      0,208,15,169,255       :REM*22      8,165,20,153,1     :REM*67
   :REM*138                 190 DATA 56,237,171,193,45,23,2    290 DATA 208,173,177,193,24,201
90 REM C000-C1B3 (49152-49588)      08,141,23,208,76,186,192,17      ,0,208,28,169,255,56,237,17
   :REM*200                  3,171,193,13,23        :REM*8        1,193,45,16,208     :REM*191
100 DATA 76,9,192,76,225,192,76    200 DATA 208,141,23,208,32,145,    300 DATA 141,16,208,172,173,193
   ,22,193,32,145,193,165,20,4      193,165,20,41,1,141,179,193      ,185,163,193,168,173,176,19
   1,7,141,173,193         :REM*240    ,201,1,208,15         :REM*80      3,153,0,208,76     :REM*227
110 DATA 32,145,193,165,20,41,1    210 DATA 169,255,56,237,171,193    310 DATA 144,193,173,16,208,13,
   ,141,174,193,172,173,193,18      4,192,173,171         :REM*132     171,193,141,16,208,172,173,
   5,155,193,141          :REM*254    193,185,163,193      :REM*245
120 DATA 171,193,174,174,193,22    220 DATA 193,13,27,208,141,27,2    320 DATA 168,173,176,193,153,0,
   4,0,208,15,169,255,56,237,1      08,96,32,145,193,165,20,41,      208,96,32,253,174,32,158,17
   71,193,45,28,208       :REM*112    7,141,173,193       :REM*34      3,32,247,183,96    :REM*119
130 DATA 141,28,208,76,69,192,1    230 DATA 168,185,155,193,141,17    330 DATA 1,2,4,8,16,32,64,128,0,
   73,171,193,13,28,208,141,28      1,193,32,145,193,165,20,41,      2,4,6,8,10,12,14,0,0,0,0,0,0
   ,208,32,145,193        :REM*136    1,201,0,208,15     :REM*36      0,0,0,0             :REM*159
140 DATA 165,20,41,15,172,173,1    240 DATA 169,255,56,237,171,193

```



# We Won't Be **UNDERSOLD**

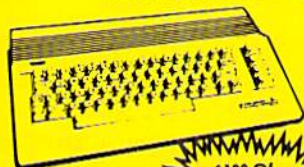
\* On items marked "No One Sells This ---- For Less". Copy of valid ad required.

15 Day Free Trial • 90 Day Immediate Replacement Policy • Prices Expire 12-31-87

## ☆ Commodore Computers, Disk Drives and Compatibles ☆

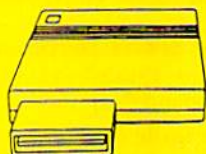
### C64c Computer

Includes GEOS (Word Processor & Versatile Drawing Program) Plus  
\*5 FREE Programs From Commodore  
Details For Free Programs included  
with purchase of C64c  
Offer Expires 12-31-1987



100 Of  
Commodore  
Software  
\*FREE!

Anti-Static  
Keyboard  
Cleaner  
Sale \$9.95



Sale



NEW

Sale Price  
**\$149<sup>95</sup>**  
List \$249

(Add \$10.00 shipping. \*)

Sale Price  
**\$119<sup>95</sup>**  
List \$149

(Add \$3.00 shipping. \*)

Sale Price  
**\$139<sup>95</sup>**  
List \$259

(Add \$3.00 shipping. \*)

### 15" NLQ Printer

Star Micronics Wide Carriage Business  
Printer For The Price Of A 10" Printer!



Sale

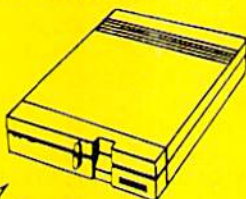
- 120 CPS Print Speed
- Near Letter Quality Print Mode
- IBM Graphics Printer Compatible
- 136 Column Wide Carriage
- Uses Inexpensive Spool Ribbons

Sale Price  
**\$199<sup>95</sup>**  
List \$499

(Add \$17.50 shipping. \*)

### 1571 Disk Drive

340K Double-Sided Disk Drive  
for the C-128 & C128D



Disk Drive  
Cleaner  
Sale \$9.95

Sale Price  
**\$214<sup>95</sup>**  
List \$329

(Add \$10.00 shipping. \*)

### 800K 3 1/2" Disk Drive

Commodore 1581 Works With  
C64/C64c, and C128/C128D.  
Over 800K Bytes of Formatted Storage  
On Double-Sided 3.5" Microdiskettes.



NEW

Sale

Sale Price  
**\$179<sup>95</sup>**  
List \$249

(Add \$10.00 shipping. \*)



Call

**(312) 382-5050**

We Love Our Customers!



Mail

**COMPUTER DIRECT**

22292 N. Pepper Road  
Barrington, IL. 60010

www.Commodore.ca  
May Not Reprint Without Permission

Circle 423 on Reader Service card.



# 1st In Price, Support, & Warranty

15 Day Free Trial • 90 Day Immediate Replacement Policy • Prices Expire 12-31-87

## 8½" Letter Size 80 Column Printer

We Liked This Printer So Much,  
We Bought Out The Factory!



**Sale \$399<sup>95</sup>**

\*Add \$ 7.50  
Shipping.

List  
\$199

- Big Blue Dot Matrix Printer
  - Heat Transfer • Enlarged
  - Graphics (Apple, Atari, & CBM)
  - Underline • Upper & Lower Case
  - True Descenders • Adapters For:
  - Commodore & Atari . . . Sale \$19.95
  - Apple IIc & Laser 128 . Sale \$12.95
  - RS-232 Adapter . . . . . Sale \$12.95
- (Please Specify Male or Female)

## Pro 20 Daisy Wheel Printer

Wide Carriage Letter Quality  
Daisy Wheel Printer



**Sale \$999<sup>95</sup>**

\*Add \$10.00  
Shipping.

List  
\$499

- Daisy Wheel Printer
- 18 CPS Shannon & 22 CPS AAA Text
- Print Wheel (Courier 10) & Cartridge
- Compatible with Diablo® & Qume®
- Friction Feed • 13" Form Width
- Extra Daisy Wheels . . . . . Sale \$ 9.95
- Parallel Centronics Interface (IBM®PC,  
Apple®IIc, Laser 128, CBM . Sale \$19.95

## 10" Comstar 1000 Printer

With Near Letter Quality  
Best Quality In The U.S.A.



**Sale \$1399<sup>95</sup>**

\*Add \$10.00  
Shipping.

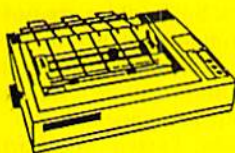
List  
\$349

- 100 CPS Draft & 20 CPS NLQ
- Serial Impact Dot Matrix • Bold
- Underline • Condensed • Italics
- Pica • Elite • Double Strike
- Dot Addressable Graphics
- Automatic Paper Loading
- Tractor & Friction Feed
- Superscript & Subscript
- Right & Left Margin Settings

*No One Sells These Printers For Less!*

## NLQ 180 (180 CPS) Printer

Near Letter Quality  
Lifetime Warranty\*



**Sale \$1899<sup>95</sup>**

\*Add \$10.00  
Shipping.

List  
\$499

- Near Letter Quality Selectable  
From Front Panel • 8K Buffer
- High Speed Dot Matrix
- Letter Quality Modes • Italics
- Elite • Pica • Condensed
- Graphics • Tractor & Friction Feed
- Lifetime Warranty on Print Head\*
- 6 Month Immediate Replacement  
Policy For Printer

## Hi-Speed LV-2010 (200 CPS) Printer

High Speed Printing (200 CPS Draft)  
with Crisp Near Letter Quality



**Sale \$2099<sup>95</sup>**

\*Add \$10.00  
Shipping.

List  
\$499

- High Speed 200 CPS Draft
- IBM® Compatible • Dot Matrix
- Near Letter Quality Printing
- Standard Pull Tractor &  
Automatic Single Sheet Loading
- Standard Parallel & Serial  
Interface Ports
- Ultra High Resolution Bit Image  
Graphics • Continuous Underline

## 300 CPS Printer

**300 CPS Draft - 50 CPS NLQ**

Comstar 1300 High Speed Printer  
With Color Printing Capabilities



**Sale \$2999<sup>95</sup>**

\*Add \$10.00  
Shipping.

List  
\$599

- 300 CPS Draft - 50 CPS NLQ
- Superb Near Letter Quality
- Variety Of Characters/Graphics
- IBM & Epson Modes • 10K Buffer
- Auto Paper Loading & Ejection
- Parallel & Serial Interface Ports
- Download Character Setting
- Front Panel Margin Setting
- Optional 7-Color Printing Kit...\$99.95

**COMPUTER DIRECT** (A Division of PROTECTO)

22292 N. Pepper Road, Barrington, IL. 60010

Call (312) 382-5050 To Order

We Love Our Customers!

\* Illinois residents add 6¼% sales tax. All orders must be in U.S. Dollars. We ship to all points in the U.S., CANADA, PUERTO RICO & APO-FPO. Please call for charges outside continental U.S. or C.O.D. MAIL ORDERS enclose cashier check, money order or personal check. Allow 14 days delivery, 2 to 7 for phone orders and 1 day express mail. Prices and availability subject to change without notice. (Monitors only shipped in continental U.S.)

VISA — MASTERCARD — C.O.D.



From p. 32.

## Machine Language

**Q** I need a program that turns machine language programs into Basic so that I can debug them, and then reassembles the modified version. If this isn't possible, then how can I list machine language?

—LEONARD ARNOLD  
GLADSTONE, VA

**A** The only products that do what you request are some underground un compilers that take a compiled Basic program and convert it back into an equivalent Basic source code. However, such programs work only if the compiled program is written in Basic, and compiled by one specific compiler.

Apart from that, the only way to do it is with an un assembler, also known as a symbolic disassembler. I developed a very simple one several years ago that's probably still in some user group libraries, but the best I've seen is Symbol Master by Schnedler Systems, 1501 North Ivanhoe, Arlington VA 22205; 703-237-4796.

**Q** I don't completely understand the decimal values used in ASCII code. When I use a machine language monitor to view the decimal value of the equals sign, it displays a value of 178, while the actual ASCII code value is 61. What's going on?

—OWEN HIXON  
MANZANOLA, CO

**A** Actually, there are two equals signs in Basic. One is the normal ASCII character, which you'll see if you view a literal string containing one. The other code is actually the Basic token (keyword) for the operation of assigning a value to a variable, or making a comparison within an If statement. You can see both uses of the equals sign at once by using the monitor to view this line:

1 A\$ = "A = B"

The first equals sign will have the decimal value 178 (\$B2 hexadecimal), and the second sign will have the value 61 (\$3D hex).

## HARDWARE

### Chips & Connections

**Q** I want to speed up my C-128's disk operations for its C-128 and C-64

modes. Can you suggest a cartridge or a replacement for the Kernal ROM? Would replacing the Kernal ROM incur compatibility problems with protected software?

—WESLEY BURCHARDT  
TAMPA, FL

**A** I hear only good things about Access Software's Mach 128. Unlike speedup cartridges for the C-64, you don't have to unplug Mach 128 to use the 128 mode, and it speeds up disk access in both C-64 and C-128 modes. If you do encounter a protection problem, however, just remove the cartridge.

A new Kernal ROM would be more convenient and might also correct some of the problems with the original C-128 ROMs, but if you get one, be sure it has a switch to instantly revert to the built-in Kernal ROM. Otherwise, you are sure to have problems with some of the more paranoid among today's copy-protected programs.

**Q** I've read that Commodore is developing a new ROM chip for the 1571 disk drive. Is this chip available yet, and if so, where can I get one?

—RAYMOND HYMAN  
PHILADELPHIA, PA

**A** A 1571 update ROM that upgrades the 1571 performance is indeed now available. I got mine today, thanks to a group purchase by the Fox Valley 64 Users Group. The part number of the new chip is 310654-05. With that information, any authorized Commodore service center should be able to order one for you. Fox Valley lists it as available from Microtech, 328 W. Hillside, N. Aurora, IL 60542; phone 312-892-3551.

The upgraded ROM was also listed in a recent ad from K. Boufal Consulting Services (244 Fitzwater St., Philadelphia PA 19147), so you won't have to go far to find it.

**Q** Would I have any problems (in either 40- or 80-Column mode) if I replaced my C-128's Z80A chip with a faster version (such as the 8 MHz Z80H) and rigged a switch to toggle between normal 4 MHz speed and a new 8 MHz time base provided by a separate crystal?

—LONNIE MCCLURE  
MEMPHIS, TN

**A** At a bare minimum I would expect problems with support or problems with memory chips not being able to operate at twice the usual speed. The best

way to speed up CP/M applications on your C-128 is by adding Commodore's 1700 or 1750 RAM cartridge to your system and moving program overlays and data to its RAM disk. Usually CP/M is disk-bound, rather than CPU-bound, and the RAM disk will correct that.

**Q** With respect to possible damage, is there any difference between physically plugging or unplugging a cartridge with the computer on and electrically switching the cartridge on or off when it's mounted on an expansion board?

—WILLIAM PACE  
S. CHARLESTON, WV

**A** There's a huge difference! It is extremely dangerous to your system to physically connect or disconnect a cartridge with the computer on. If the cartridge doesn't mate precisely with the contacts in the cartridge port, they'll almost certainly short out and damage your computer.

To switch a cartridge on or off, either first turn off the computer and all connected accessories, or else use an expansion board with an on/off switch for the cartridge.

**Q** I have a space problem behind my computer, so I'd like to use a ribbon cable to connect a multiple expansion module to the expansion port on my Commodore. Is it possible?

—H. FELBER  
FORT MYERS, FL

**A** Yes. Such cables are now available from at least two sources. Aprotek (1071-A Avenida Acaso, Camarillo, CA 93010) offers a 10-inch ribbon extender for about \$23 postpaid, and Value Soft (3641 SW Evelyn St., Portland, OR 97219) has one that's 12 inches long for the same price.

Another reader asked the same question about extending the user port with a ribbon cable. That, too, is offered by Aprotek.

**Q** My computer system and lights are all plugged into the same circuit, the computer system via a surge protector power strip, and both lights and equipment dim whenever the furnace kicks on. So far, the circuit breaker has tripped twice. Is there an uninterruptible power supply (UPS) for the Commodore? I don't want to relocate my system or reroute the wiring if I can avoid it.

—KAREN LANDRETH  
CAMDEN, SC



**A** Yes, there is. However, the least expensive UPS I could find is the UPS-210, a \$250 unit from Power General Corp. (617-828-6216). Typical UPS prices run to several thousand dollars.

I can't recommend a UPS, however, even apart from its cost. You'd be better off installing a new circuit for your computer system and lights. Even using an extension cord in an outlet on a separate circuit would probably be safer than your current setup.

**Q** Where can I buy a one-slot expansion board—just an adapter—that will plug directly into the game port so that game cartridges can plug into it and not the port itself? If I can't buy one, how would I go about making one?

—ROBERT DESKO  
ENDICOTT, NY

**A** Value-Soft of Portland, OR, has advertised exactly what you want in recent issues of *RUN*. The product is called 'LBox and sells for about \$30.

**Q** My kids are continually switching joysticks, and the plugging and unplugging seems to put a lot of stress on the connectors. Is there a 12-inch cable with suitable connectors that could be left plugged into each port, then the joysticks plugged into that?

—J. VOGEL  
WOBURN, MA

**A** Radio Shack sells a joystick extender cable somewhat longer than you want, but adequate for your needs. I use it to plug the oversized connector on Flexidraw's light pen into my C-128.

**Q** My C-128 and peripherals are plugged into a six-receptacle surge suppressor. Lately, my monitor has been flickering once or twice each second and making crackling noises. I thought it might be interference from an appliance, but turning my appliances off didn't help. I've been using my Plus/4 with the same monitor, without any flickering or crackling. Does this suggest anything?

—ROBERT SHANFELDER  
ADDRESS UNKNOWN

**A** Yes. It suggests that you may be overloading your surge suppressor. If the suppressor includes a noise-filtering feature, it will be limited to a specific, and often low, wattage, and color monitors, printers and modems are all power hogs. In all likelihood your C-128 is putting more of a strain

on your surge suppressor than is the Plus/4.

Try plugging just the C-128 and the monitor directly into a wall socket. If the problem persists, it's either in the C-128 or its power supply and should be investigated further by an authorized Commodore service center.

### General

**Q** Is it safe to leave a C-64 on for eight or more hours at a time?

—JOHN HIND  
BALTIMORE, MD

**A** Yes. Many C-64s are used around the clock and never turned off, including the one *RUN* uses for its Running Board BBS (603-924-9704). But you should keep the system from overheating, especially the power supply, which should have air flowing freely around it, including its underside. If you leave your system running unattended, it's a good idea to turn off the monitor.

### Input Devices

**Q** Is there a way to remove keys from a keyboard without ruining them? I want to swap some of the keytops on a C-16 keyboard (bought from Radio Shack for \$5) that are incorrectly located for the C-64.

—JERRY VAN VACTOR  
SPEARFISH, SD

**A** Simply fashion a small hook from a paper clip, slip it into the gap between the keys, then into the recess underneath the keytop you want to remove, and gently pull up on the hook. The keytop should easily slip off its post. Then recap the post by gently pressing the C-16 keytop back onto it so that the slot in the keytop mates with the post.

**Q** How do I use the right-hand button on my 1350 mouse with the C-128?

—BILL LEAGANS  
PRATTVILLE, AL

**A** The right-hand button on your mouse is connected to pin 9 of the control port, which was originally intended to be used by the potentiometer on one of a pair of game paddles. The May 1987 issue of *The Transactor* (416-878-8438) details the procedure for adding a 47K pull-up resistor between pins 7 and 9 to make the right button readable at address \$D419; the issue also

gives you the needed assembly language programming to use the button (and the rest of the mouse). It's not written for beginners, but it should solve your problem nicely, as long as you know how to use both a soldering iron and an assembler.

**Q** I recently bought a Commodore 1350 mouse, and, after looking through the pamphlet that came with it, I realized that true 360-degree, variable-speed mouse control is impossible with the pins it uses. The pins control only one button and four directions, simulating a joystick. Did I waste my money?

—REMY FOX  
TORONTO, ONTARIO, CANADA

**A** Yes, if what you wanted was a true proportional mouse. What you really needed was the 1351 mouse, which is a true Amiga/Mac-like mouse for the C-64/128.

### Data Storage Devices

**Q** I own a VIC-20 and a 1540 disk drive. I've upgraded to a C-128, but I can't use the drive with it. Are there any chips available to turn the 1540 into a 1541?

—LUIS RAMOS MARCIN  
MEXICO D. F., MEXICO

**A** All you need to upgrade your 1540 to a 1541 is a replacement Kernal ROM for the 1541. You should be able to get one from any authorized Commodore service center. If not, order one from *The Transactor* (phone 416-878-8438) for \$60 Canadian.

**Q** Are there any 1571-compatible, non-Commodore disk drives on the market yet, and will the 1581 work with both the C-64 and C-128?

—RONALD PACK  
AURORA, CO

**A** Emerald Components (Eugene, OR, 1-800-356-5178) is advertising a 1571-compatible disk drive called the Excel-71.

As for the new 1581 3½-inch disk drive, yes, it works on both the C-64 and C-128, adding storage space to both.

**Q** I have a C-64 and a 1541 disk drive, and I'll be purchasing a C-128 for office use. I want the 128 to be able to read 1541 program disks. The 1571 seems to provide the 1541 readability, faster loading and double sided/double capacity. Will the 1572 disk drive provide these features, and does it com-



## COMMODORE CLINIC

pare favorably with the 1541 as far as my purposes go? Can the C-128 operate the 1541 drive without special tricks?

—ROGER STOKES  
PARK FOREST, IL

**A** Sorry, but Commodore cancelled the 1572 drive. The 1571, however, is still readily available and reads 1541 disks quite well. Going the other way, yes, a C-128 will happily operate your 1541 disk drive, but you won't get faster loading speeds in 1541 mode.

**Q** My 1541 disk drive is slower than the specified speed of the drive. Can I repair my drive so it will spin at the regular speed?

—RYAN WONG  
ALHAMBRA, CA

**A** First, how did you discover that the drive speed is incorrect? At least one well-known speed-measuring program was itself incorrect when it was first released. The best way to be sure of the drive speed is by looking at the strobe disk (on the bottom of the drive inside the case) under fluorescent light. When the drive motor is on, the strobe disk (the 60 Hz one in the United States and the 50 Hz one elsewhere) should appear to be standing still. If it isn't, adjust the small speed-adjustment screw, which is located in the small hole near the strobe disk. Be sure to notice its initial setting, in case you need to restore it later.

It probably will take you the better part of an hour to remove the drive case, view the strobe disk and put things together again. Since the 1541 works well within a fair range of speeds, I wouldn't recommend opening it unless the drive is giving you trouble, and then only after the warranty has expired.

**Q** I have a C-128 and a 1571 disk drive. When I format one side of a disk, everything works fine, but when I format the flip side, the first side doesn't work. What's wrong? I've changed 1571s twice, but I still have the same problem.

—RENE DEL VALLE  
QUEENS, NY

**A** The "problem" is that the 1571 is already a double-sided drive and automatically formats both sides of the disk at the same time. The popular trick of cutting an extra hole in a disk to format its flip side is unnecessary on a 1571. Each time you flip the disk and reformat, you're destroying what you've already done on the first side.

**Q** Is it possible to connect a hard disk drive to the C-128? If so, where could I find one at a reasonable price?

—JEFF MILLER  
MIDLAND, VA

**A** Xetec (Salina, KS) has a 20-megabyte hard disk drive for the C-64 and C-128, called the Lt. Kernal. The drive plugs into the computer via Fiscal Information's Lt. Kernal cartridge, allowing it to run several times faster than if it were connected to the serial bus. CSI (Melbourne, FL), ICT (Frederick, MD) and JCT (Grants Pass, OR) are also marketing hard disk drives. Drives are available in ten- and 20-megabyte configurations and range in price from around \$700 to \$1000.

**Q** I'm considering souping up my 1541 with a more powerful electric motor to make up for the drive's slow speed. However, I'm afraid this might render my disks useless or even refuse to load or save programs. Any advice?

—LEONARD ARNOLD  
GLADSTONE, VA

**A** Actually, it isn't the motor in the 1541 that makes it run so slowly. The real slowpoke is the bit-serial interface method Commodore chose to use with the drive and computer in order to cut costs. So, even if you could increase the rotation speed of your floppy disks, you probably wouldn't notice any improvement in data transfer speed.

If you want to speed up your disk drive's performance, get a program that speeds data transfers, such as Mach 5, from Access Software.

**Q** I regularly turn my 1541 disk drive off and on with the disk still in the drive. In my view, the equipment should have been designed to operate this way. Yet both you and my Emerald FSD-1 manual caution against this practice with near-religious fervor. I wish someone would clarify this point once and for all.

—BEN JOHNSON  
ADJUNTAS, PR

**A** I agree that the 1541 should be designed to work properly when switched off and on with a disk in place. Commodore knows how, having designed both its 8050 and 8250 drives properly in this regard. In all early 1541s, however, a serious problem can arise whenever power is lost with a disk in place.

When you cut off the power to your drive, the voltage that's used for save operations lingers longer than the voltage that's used to prevent a save operation from being executed. Thus, there is a small but real chance that erroneous data will be saved to your disk any time you switch off the power with the disk in place or if there's a power failure.

The simplest cure is to release the lever that loads the drive head so that the head is retracted from the disk. Then you won't need to actually remove the disk.

**Q** What would make a 1541 lock up and produce a File Not Found error that can't be corrected by shutting down the system?

—GENE BRICKER  
SANTA FE, TX

**A** Most likely, your 1541 is losing track of where its drive head is, which is something it discovers only by brute force—banging the head up to 40 times against the track 1 stop. This is possibly a side effect of running copy-protected programs, or programs that copy copy-protected programs.

When you have this problem next time, try gently inserting into the drive the cardboard that you found in the drive when you first unpacked the unit. The cardboard will often push the head back into its normal position, allowing other commands to work.

**Q** Reader's comments on copy protection in Mail RUN sparked some fears in my mind. Could my software damage my 1571 disk drive? While some programs are loading, I hear a chattering noise inside the drive. Could this cause head misalignment, and, if so, can you recommend a word processor that doesn't do this?

—WESLEY BIBRO  
ALGONQUIN, IL

**A** Chattering noises during a program load are indeed usually due to copy-protection tricks employed by the manufacturer of the program. Such tricks often cause drive misalignment on the 1541, requiring a costly adjustment or an even more costly permanent fix. Fortunately, the 1571 has an added track 1 sensor, which largely eliminates the stresses that led to misalignment on the 1541.

Even so, there is really no reliable substitute for backing up your important programs.

Two excellent and widely available



word processors that are no longer copy-protected are PaperClip, from Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404), and Word Pro 128/S, from Spinaker Software (One Kendall Square, Cambridge, MA 02139).

**Q** *I'm considering purchasing another 1571 disk drive, but I can't locate any information on how to use two disk drives with copy-protected software. I don't want to buy another 1571 and then discover that I can't use the second drive because the device number within the program can't be changed.*

—CHERYL MANSFIELD-EGANS  
KINGWOOD, TX

**A** As you might already know, changing the device number of a 1571 drive is simply a matter of flipping a small switch on the back of the drive. C-128 Basic programs that can be modified are easy to adapt for use with added drives. For example, you can add the phrase ON U(9) to the end of disk commands intended for disk unit 9.

Copy-protected programs present a special challenge. Instead of trying to adapt these yourself, simply limit your purchases to programs that explicitly support multiple disk units. Such programs are becoming more and more common as Commodore owners expand their systems. Fortunately, CP/M programs, the ones most likely to require two disk drives, also are the least likely to be copy protected.

## Output Devices—Video

**Q** *I'm looking for a color monitor for my SX-64. Any suggestions?*

—RUPERT TOBISCH  
WALNUTPORT, PA

**A** I've used the Commodore 1702 monitor with excellent results, but if I were to buy one now, I'd probably get the 1902A for its 80-column color capability with other computers.

**Q** *How can I hook up more than one monitor to my C-128?*

—JASON MARINER  
ALBUQUERQUE, NM

**A** Being able to hook up two monitors at once is one of the C-128's nicer features, which was part of Commodore's original demonstrations when they first released that computer.

Simply connect one monitor to the

composite video port (the one with an 8-pin DIN plug), and the other to the RGB port (the one with a 9-pin sub-miniature D connector). Naturally, the one connected to the composite port needs to be a composite monitor, such as Commodore's 1702, while you'll need an RGB monitor for the RGB port, such as an IBM color graphics display. Or you can plug both connectors into Commodore's 1902A monitor, and use it in both modes alternately by selecting RGB or composite from a switch on the front of the monitor.

## Output Devices—Audio

**Q** *For some time now my C-64 has refused to broadcast sounds that are a part of the programs I use. I took it to a computer repair store, and the staff there said the problem was a blown audio fuse. I'd like to install the fuse myself, but I haven't found a place that sells them. Can you help?*

—KEVIN BROWN  
HANCEVILLE, AL

**A** First of all, find a new service center. There's only one fuse in the C-64, the power fuse, and it has nothing to do with audio. Had the fuse blown, your entire system would have stopped working.

However, before you take your 64 to someone else, check the volume and fine-tune controls on your TV or monitor. If all you hear is silence, try a different TV or monitor with a speaker that you know is working. If you do get sound from that unit, then the problem is in the original TV or monitor. Otherwise, the problem is in your computer, possibly in the SID (sound interface device) chip. An authorized Commodore service center can determine this by inserting a SID chip that works.

## Output Devices—Modems

**Q** *I've been advised to buy the C-1660 modem to use with my C-64. I thought the C-1670 was the same kind of modem, only faster, with the ability to automatically switch to different speeds. Which modem is better?*

—RUSS HERLING  
ROCKVILLE CENTRE, NY

**A** In the world of modems, faster is usually considered better, since most phone companies and on-line services charge by the minute. A 1200-baud modem (1670) transmits and receives information four times faster than a

300-baud modem (1660), potentially cutting down the time you pay for by a corresponding amount. On the other hand, some on-line services charge extra for 1200 baud, so, if all you want is to read and type messages, 300 baud may be preferable. A speed of 300 baud is comfortable for reading and faster than most people type.

If you think you'll ever want the added speed of a 1200-baud modem and can afford its higher price, buy the 1670. It works at both 300 and 1200 baud and has a handy, built-in speaker to inform you, in those seconds before you're connected to the system you're calling, of happenings on the phone line, such as dial tones, busy signals, electrical interference and irate people awakened in the middle of the night.

**Q** *Can I use my C-128 to communicate via modem with another C-128 in Iceland?*

—G. VIDARSSON  
SANTA BARBARA, CA

**A** Sure. Almost any 1200-baud modem compatible with your system should be suitable. Unlike 300-baud modems, 1200-baud units use a compatible protocol in both the U.S. and Europe.

## Output Devices—Printers

**Q** *I just received a new printer, and I'm happy with it except that it uses the same serial port on my computer as does the disk drive. I'm aware of a device that allows both a printer and a disk drive to be connected to the C-64 at the same time. Any information is appreciated.*

—BARRY ASHWORTH  
TUCSON, AZ

**A** If you look at the back of your disk drive, you'll see a second serial bus connector. To use your disk drive and printer at the same time, connect the drive to the serial port at the back of the computer, and connect the cable running from the printer to the other port on the back of the drive. This is known as daisy-chaining, which allows you to hook up several devices at once.

**Q** *I own a C-64, 1541 disk drive and Gemini 10X printer. My problem is that the drive won't load or run many programs unless the printer is on if it's connected. Since I don't always need the printer, I sometimes disconnect it before turning on the system. Will this connecting and disconnecting*



# Special Products C-64, C-64C, C128

## ADD A COMPUTER

**128 PLUS** adds a new computer to your C-128. It looks like a C-64 but it doesn't act like a C-64. True it loads (up 5 times faster) and runs (almost twice as fast) your favorite C-64 programs. But it is a C-64 with more features than the C-128. A C-64 with all the keys on the C-128 keyboard, including the numeric keypad, function keys (with better functions than the C-128), and most of the rest of the top row of keys. A C-64 with 16 built-in DOS/Wedge commands. A C-64 with a built-in PrintCable driver for "Centronics parallel" printers. If you find a piece of software that doesn't work with **128 PLUS** a simple depression of the 40/80 key returns you to the old C-64. Don't delay any longer get a C-128 PLUS for your C-128 or C-128D and discover a whole new world of C-64 performance.

C-128 PLUS, C-128/C-128D ..... \$39.95\*  
C-128 PLUS PrintCable, Parallel Printers . \$19.95\*  
C-128 PLUS and PrintCable ..... \$54.95\*

A major manufacturers magnificent multitude, magnanimously merchandised for minimal money.

## 1571 FIX ROM

Relative File problems? "DEVICE NOT PRESENT" errors? I/O error 5 when using Superbase? Major problems when you have 2 or more files open? Painfully slow writing to the second side of the diskette? SAVE with replace problems? Takes forever to recognize a "Flippy" disk? If you have one or more of these problems with your Commodore 1571 disk drive, don't despair, don't trash your 1571, do get a:

1571 FIX ROM ..... \$24.95\*

## FAMILY TREE

Truly a program for the whole family, your wife's family, your parent's family, grandparent's family, and as many generations back as you wish. FAMILY TREE is the best genealogy program for the C-64/C-64C or C-128. Features unlimited genealogies, 4, 5, 6, generation pedigrees, family record sheet and much more.

FAMILY TREE, C-64/C-64C-1541 ..... \$49.95\*  
FAMILY TREE, C-64/C-64C/1541 (LDS) ... \$49.95\*  
FAMILY TREE, C-128/1541/1571 ..... \$49.95\*

## QUICKSILVER 128

**QUICKSILVER 128** our premier IEEE-488 Interface for the Commodore 128 is now in stock and even better than we had planned. Quicksilver 128 offers an IEEE Interface for the Commodore 128 in the C-128 mode (40 or 80 columns) and in the C-64 mode as well. **QUICKSILVER 128** will inter-connect your Commodore 128 to Commodore SFD 1001, 2031, 2040, 3040, 4040, 8050, 8250, 9060, 9090 Disk Drives, and 2022, 2023, 4022, 4023 and 8023 Printers.

QUICKSILVER 128 C-128 ..... \$119.95\*

## IEEE Flash! 64

**IEEE Flash! 64** our premier IEEE-488 Interface for the Commodore 64 is now in stock and even more transparent (program compatible) than **QUICKSILVER 64**. **IEEE Flash! 64** will inter-connect your Commodore 64 to Commodore SFD 1001, 2031, 2040, 3040, 4040, 8050, 8250, 9060, and 9090 Disk Drives, and 2022, 2023, 4022, 4023, and 8023 Printers.

IEEE Flash! 64 C-64/C-64C ..... \$99.95\*

Please add \$4.50, U.S. and Canada, \$15 Europe and Asia, shipping and handling. California residents, please add sales tax.

For Information, Call or Write:

1-800-227-9998 1-415-965-1735



**Skyles  
Electric Works**

231-E South Whisman Road, Mountain View, CA 94041

## COMMODORE CLINIC

*wear out the port prematurely, or will leaving the printer on all the time overheat it and wear it out prematurely?*

—MILT WIGSMOEN  
SAUK VILLAGE, IL

**A** The failure of your disk drive to operate with the printer off is probably due to the printer interface you're using. That feature was probably added intentionally to keep you from starting the system without the option of using the printer. The same problem may occur if the printer is turned on, but out of paper or off-line for another reason. Since this bothers you, look in your printer interface manual—there may be a way to disable its check for printer readiness.

Otherwise, just leave your printer on whenever the computer is on. It's in less danger of overheating than your computer and disk drive, and it uses very little power except when actually printing.

**Q** Are the 1525, 1526, MPS-801 and MPS-802 all different printers or just two printers with different names?

—MICHAEL SPINK  
BRIDGEPORT, WV

**A** The 1525 and MPS-801 belong to one family of printers, different in appearance and some features, but sharing the same set of commands for such things as high-resolution graphics. The 1526 and MPS-802 also are similar in their commands and features, but both are quite different from the 1525 and MPS-801.

Although the 1526 and MPS-802 have some excellent features, most Commodore-compatible software is designed for the 1525 and MPS-801. This is especially true of programs that use graphics. The MPS-801 and MPS-802 are more recent and have replaced the 1525 and 1526 for the most part.

**Q** I need your help in finding a letter-quality printer for my C-64. I use the C-64 with a dot matrix printer, which is fine for drafts, but not for correspondence.

—JEAN SPENCER  
GREENBELT, MD

**A** The key to success in choosing the right printer for word processing is to choose the one recommended by the manufacturer of your word processing program. It's the only way to be sure that the program will support all

of the printer's advanced features, and that the printer will support all those of the program. I've always used models from the C. Itoh Starwriter line, using a Cardco interface, but other users are just as happy with one of a dozen other brands, so long as the printer and interface are supported by the word processing program that will be used with them.

One other warning. If you want a tractor-feed or sheet feeder, get one when you buy a printer. Later you might find both more costly to buy and very difficult to locate.

**Q** I recently purchased an Okimate 20 printer. I find I'm using up a ribbon cartridge every two weeks, at a cost of \$5-\$6 per cartridge. Is there any better alternative?

—KEN CHERRY  
SPRING GROVE, PA

**A** You have discovered the Achilles heel of thermal and thermal transfer printers. Despite very attractive initial purchase prices and attractive printouts, the cost of their consumable supplies is usually quite high compared to other printers.

You might, however, be able to reduce your ribbon costs somewhat by going with another supplier or buying in bulk. One friend reports good success using "Pelican" ribbons. Another reputable supplier, Quill Corporation (100 S. Schelter Road, Lincolnshire, IL 60197) recently offered ribbons for the Okimate 20 at \$3.58 each.

**Q** I bought my Leading Edge Banana Gorilla printer from DAK Industries, and I want to use it with my C-64. The printer has a 25-pin female interface. Where can I buy the male counterpart?

—RODNEY MULLINEAUX  
IRVINE, CA

**A** As I recall, DAK Industries (8200 Remmet Ave., Canoga Park, CA 91304; 800-DAK-0800) sold an interface that connected to the user port of the C-64. However, the user port is not the best place to connect a printer, because few Commodore programs support RS-232 printers via the user port.

Instead, consider the Cardco PS printer interface, now being marketed by Supra Corporation (1133 Commercial Way, Albany, OR 97321; 503-967-9075). One end connects to Commodore's serial bus like other printer interfaces; the other end provides your



## COMMODORE CLINIC

printer with the necessary unidirectional RS-232 port. Just be sure your Banana Gorilla can communicate at 1200 baud, since that is the only serial communication speed supported by the PS interface.

A more flexible interface is available from Omnitronix (760 Harrison St., Seattle, WA 98109). It costs a bit more, but it works at any desired baud rate and supports graphics on some printers.

**Q** Will the graphics interfaces I've seen advertised for Commodore computers let my non-graphics printer print graphics characters?

—VINNIE ZAK  
SHELTON, CT

**A** No, normally they won't. Graphics interfaces are designed to convert the Commodore graphics commands for Commodore graphics printers into equivalent commands for other graphics printers. Such interfaces became necessary when Commodore chose not to support Centronics parallel printers or Epson graphics and not to offer its own high-quality graphics printer.

**Q** Can you recommend a laser printer for use with our Plus/4 and 64C computers? What interfaces would be required for small-business use?

—PAUL HEIL  
LANCASTER, PA

**A** Jim Oldfield reports that his Midnite Press book *How to Get the Most Out of GEOS* was written using a Quadram Quadlaser printer, connected to a C-128 via a Xetec Super Graphix interface in Transparent mode, and using WordPro 128/S, from Spinnaker Software.

The Quadlaser comes with four built-in fonts and has a megabyte of RAM in which to load other fonts, so the only real difficulty in controlling it from a Commodore computer is making sure your favorite word processor allows you to embed long sequences of control characters within a document.

For a Plus/4, you may also want to consider using an MW350 printer interface. It is particularly recommended by the Plus Exchange, and also works well with the C-64 and C-128.

A far more costly but also more flexible laser printer is Apple's LaserWriter. You can use it with your 64C (but not the Plus/4) via the GEOS geoLaser driver and such GEOS programs as geoWrite and geoPublish. Since IBM

has just joined Apple in endorsing the LaserWriter's Postscript page description language, the LaserWriter should be compatible with new products for years to come, making up for its relatively high initial price.

**Q** My Epson LX-80 printer is slow in printing out graphics, but it works at normal speeds with programs that use only nongraphics characters. Is my printer interface causing the problem, and, if so, what type interface should I use instead?

—MARK FRIED  
CHATSWORTH, CA

**A** Most of the slowness is due to the computer and printer having to communicate far more information to print a line of graphics than to print a line of text. The text character set is already built into the computer and printer, and a single byte of information is all that's needed to be communicated in order for the printer to print any nongraphics character. On the other hand, high-resolution graphics are sent one pixel, or dot, at a time, and they require at least eight times as much information for each line of output. This guarantees that your word processor files will always print faster than those from graphics programs.

Another problem is that if each byte of graphics data is sent to the printer separately, there can be a long delay in transmission from the interface itself. Adding even one extra byte of buffer memory can help greatly, by sending a character from the computer to the interface at the same time the interface sends one to the printer. If you cannot tolerate the delays, consider getting a printer interface that includes extra buffer memory. It should speed up your printouts somewhat. If you do much word processing, get a buffer large enough to hold your longest document.

**Q** I recently purchased an MPS-1000 printer for my C-64. Now I'm having problems with crooked printing on the hard copy. I've tried adjusting the paper setting, but that doesn't work. What should I do?

—MIKE MEYN  
BAYSIDE, NY

**A** Aligning paper on friction-feed printers like the MPS-1000 can be a problem. Although the first few sheets seem to be aligned, the misalignment becomes more apparent with each advance of a sheet. I've been told the reason is because the left side of the sheets

Re-ink ANY FABRIC RIBBON automatically for LESS THAN 5 CENTS with

### MAC INKER™



Over 11,000 cartridges and spools supported!

#### MAC INKER

IMAGEWRITER I AND II	\$42.00
UNIVERSAL (cartridge or spool)	\$68.50
MULTICOLOR IMAGEWRITER	\$80.00
MULTICOLOR ADAPTER ONLY	\$40.00
Shipping (first unit)	\$3.00

■ Lubricated DM INK EXTENDS PRINT-HEAD LIFE! Black, blue, brown, red, green, yellow, purple, orange - 2 oz. bottle \$3.00; pint \$18.50. Gold, silver, indelible and OCR inks available. Heat transfer MacInkers and ink available plus a complete range of accessories for special applications.

■ Top quality, GUARANTEED, double density ribbon cartridges and reloads available.

■ DEDICATED MACINKERS AVAILABLE FOR EXTRA LARGE OR SPECIAL CARTRIDGES.

### MERCURY MODEM

**\$149.00**

Shipping \$4.00



\*100% Hayes™ compatible! ■ 24 month warranty. ■ Status lights. ■ Speaker. ■ 300/1200 baud. ■ Call progress detection.

Quick Link communications software:

MS DOS and Macintosh	\$29.95
with modem	\$15.00
Cable	\$15.00

\*Hayes is a trademark of Hayes Microproducts.

### A BUFFER AND A DATA SWITCH!

#### PROTEUS™



The "Siamese" Buffer	
64K	\$199.00
256K	\$299.00
Cable	\$10.00
shipping \$4.00	

■ Proteus directs two printers (working simultaneously) and frees your computer for other applications.

■ Now you can merge a form letter with your mailing list, set up one printer with letterhead, the other with envelopes, press "START" and RELAX while

#### PROTEUS DOES IT ALL—ALL AT ONCE!

■ Compact. ■ 2 parallel ports. ■ Multiple copy capability. ■ "Flexible Capacity" buffer for each port.

1986 "Best Buy of the Year" Award! — Computer Shopper

**SPECIAL OFFER:** For orders of \$100.00 or more. Say you saw it in RUN and get a free keychain, beeper and flashlight combined! A \$15.00 value!

#### ORDER TOLL-FREE

1-800-547-3303

In Oregon (503) 626-2291 (24 hour line)

We are and always will be your

## Computer Friends®

14250 N.W. Science Park Drive  
Portland, OR 97229, Telex 4949559  
Dealer Inquiries Welcome.



receive more characters, and thus more pounding from the printhead, than the right side.

Years ago when I had the same problem with a printer, I fixed it by taping two pencils vertically to the back of the printer as paper guides, putting one on each side of the paper supply. It didn't solve the problem completely, but it did help immensely.

Be sure to place your paper supply directly behind the printer and level with or above the top of the platen, so that the paper feeds into the printer without making the printer mechanism work so hard.

**Q** My Commodore DPS 1101 daisy wheel printer works great except it needs a tractor feed. Can one be purchased anywhere?

—JIM WERRE  
SAN JOSE, CA

**A** The 1101 was essentially a Juki printer under the skin, a model 6100, if I recall correctly. Since a tractor feed has definitely been available for the Juki, you should be able to use the same one on a 1101. Lyco Computers (800-233-8760) offered the Juki 6100 in a recent issue of *RUN*, so your might ask them about your tractor feed.

### Specific Computers

**Q** What are the differences between the C-128 and the B-128 computers?

—JEREMIAH BROOKS  
FRANCONIA, NH

**A** The B-128 was the last of the Commodore CBM models sold in the U.S. It included many of the features later incorporated into the C-128, such as an expanded version of Basic, expanded memory and an improved keyboard. However, it was a monochrome machine and largely incompatible with the C-64, even though the two machines could share simple Basic programs.

The B-128's primary disk drive, the 8050, was well made and possessed a much larger capacity than a 1541 or even a 1571. However, it used a format incompatible with the C-64, which prevented disk swapping with C-64 owners. Similarly, the B-128's printer, the 8023, used graphics commands different from the 1525's and 801's, so it was incompatible with graphics printing programs for the C-64.

The B-128 was also, in some respects, an unfinished machine, since the

CP/M and MS-DOS options originally planned for it never materialized, at least not in the U.S. When the B-128 was discontinued, Commodore sold them at attractive closeout prices, primarily through a U.S. dealer.

The key difference between a B-128 and a C-128 now is that there probably won't be many new programs for the B-128. Thus, it's a good purchase only if the price is right and all needed programs are included.

**Q** Is there a big difference between Commodore's new model 64C and my C-64? Also, would I need to buy a new disk drive to use with the 64C?

—ALBERT SCHUMACHER  
ADDRESS UNKNOWN

**A** The main changes in the 64C are the plastic housing, which has been redesigned to match the style of the C-128, and the inclusion of the GEOS operating system shell program. There have been some internal changes also, such as in the power supply, but nothing to justify replacing a properly working C-64 with a 64C. If you wish to own a copy of GEOS, it's regularly advertised in *RUN* and works fine on C-64s of any age.

**Q** We're considering replacing our C-64, two 1541 disk drives and a 1702 monitor with a C-128, two 1571 drives and a 1902A monitor. We use our computer system for business, so it must be reliable. Are the 128 and 1571 reliable? Except for replacing a voltage regulator, one fuse (our fault) and aligning the disk drives, we haven't had to service our C-64 in over three years.

—GARY SHERMAN  
CERESCO, NE

**A** If reliability is your primary concern, you already have it. If you want additional reliability, then perhaps instead of replacing your current system, you should supplement it.

You already have two disk drives. If you had a spare computer and monitor or TV, you'd be assured of continued operation after any single failure. Naturally, buying a C-128 and 1902A is one good way to get that second computer and monitor.

**Q** I bought my C-128 back in July 1985, and I'd like to know if the new 1700

and 1750 RAM packets will work on my computer?

—WAYNE AARON  
SCOTT HILLS, TN

**A** Some early C-128s had defective cartridge ports and thus may not work with RAM cartridges. One quick way to find out whether your cartridge port is defective is by trying out the Ranch cartridge from Spinnaker Software. If it runs, your cartridge port is good, and should also work with a RAM cartridge.

### MISCELLANEOUS

**Q** Where can I find programs to use with my 1520 printer plotter?

—JOHN ELBERSON  
BONITA, CA

**A** The International Commodore Products User Group (ICPUG) in England has just announced the resurrection of its 1520 user's group and the availability of a disk of programs for the 1520. You can order the disk from W.G.C. Austin, School of Geography, Faculty of Humanities, Newcastle Polytechnic, Lipman Building, Sandyford Road, Newcastle-Upon-Tyne, NE1 8ST England. The asking price is a disk with a program for the 1520 on it, together with return packing and money for postage. You might also offer to join ICPUG.

**Q** I've called nearly every dealer in northeast Ohio for a copy of the Programmer's Reference Guide for the Commodore Plus/4. Where can I buy a copy? Also, does Commodore or any dealer carry software for the Plus/4?

—KEITH SCHRODE  
SALEM, OH

**A** According to the information I received from Calvin Demmon, president of the Plus/4 Users Group (PO Box 1001, Monterey, CA 93942), the reference guide is published by Scott Foresman Professional Publishing Group (1900 East Lake Ave., Glenview, IL 60025) and retails for \$22. Any bookstore should be able to order it for you. You'll also be happy to know that you may order 50 or so programs for the Plus/4 directly from Commodore, and PLUG offers some public domain programs itself. Membership in PLUG is \$20 a year, and it's probably a good investment for any Plus/4 owner. ■



## MAGIC

From p. 46.

### UNNEW PROGRAM

If you ever accidentally erase a program with the New command (a not uncommon occurrence—just wait till you do it yourself), you can restore it with the program below, which creates an Unnew program on disk as a machine language file. Insert the disk in the drive and type BOOT "%UNNEW" and hit return. If you have a graphic screen active at the time, type GRAPHIC1:GRAPHIC0 in Direct mode before booting %UNNEW. After you boot %UNNEW, your Basic program will be restored.

```
10 REM C-128 UNNEW-L. K. SNYDER
20 BANK 15:FORI=2816TO2833:READA:POKEI,A:NE
  XT
30 BSAVE"%UNNEW",B0,P2816TOP2834:END
40 DATA 165,45,133,251,165,46,133,252
50 DATA 160,0,169,1,145,251,32,229,94,96
```

—L. K. SNYDER, ADDRESS UNKNOWN

### SYS IN REVERSE

I found a reference to an undocumented C-128 keyword in my copy of the *C-128 Programmer's Reference Guide*. The keyword is RREG, for Read REGISTERs, and it works much like the SYS command. You can "read" the results of the last SYS you called with RREG A,X,Y,S. This reads the values of the Accumulator, X register, Y register and the Status register into variables A, X, Y and S, respectively. You can use any variables you like and can read any register by substituting commas to skip the other registers. For example, to put the value of the Y register into variable YR, use the command RREG ,YR. This makes it very easy to pass parameters with SYS and read the results back into variables.

Here's a practical example that gives the current window size. Use ESC T to set the top of a window and ESC B to set the bottom.

```
10 REM C-128 RREG -JIM BORDEN
20 BANK15:SYS65517:RREG ,X,Y
30 PRINT"WINDOW IS"X+1"COLUMNS WIDE"
40 PRINT"AND"Y+1"LINES HIGH."
```

See "From Hi-Res to Ultra Hi-Res" on page 90 for another example.

—JIM BORDEN, CARLISLE, PA

### CALCAID 128/64

CalcAid 64 (see *RUN*, November 1986) lets you view its spreadsheet only three columns at a time. Adding the lines below will give you full use of the C-128's 80-Column mode so that you can view seven columns at once and use the Fast mode. The C-128's function keys are redefined to the function key values for the C-64 (except that you cannot control the 80-column screen colors). Use CTRL/X to end the program and restore your original function key definitions. The 40-Column mode will also work, but, of course, CalcAid returns to the three-column display, and you must then use Slow mode.

```
2 REM CALCAID 64/128 - JIM BORDEN
3 REM CHANGES TO ALLOW 40/80 COL
6 PA=1:Z=0:P=100:SW=27:CW=2:IFFRE(0)=FRE(1)
  GOTO20
8 IFPEEK(215)THENSW=23:CW=6:SW$="{39 SPACES
  }"
```

```
9 F9=1:FORCD=4096TO4113:POKE CD+238,PEEK(CD
  ):NEXT
10 FORCD=4096TO4113::READ R:POKE CD,R:NEXT
11 DATA 1,1,1,1,1,1,1,0,0:REM NEW F KEYS
12 DATA 133,137,134,138,135,139,136,140
70 IFG$=CHR$(29)THENIFC<SWTHENC=C+1:GOSUB10
  000:GOTO30
110 IFG$=CHR$(24)ANDF9=1THENFORCD=4096TO411
  3:POKE CD,PEEK(CD+238):NEXT:END
2160 C=VAL(MID$(IN$,2,2)):IFC>29-CWTHENC=29
  -CW
2162 IFASC(LEFT$(IN$,1))>70THENRD=6
2163 IFASC(LEFT$(IN$,1))<=70THENRD=ASC(LEFT
  $(IN$,1))-65
10010 PRINTCHR$(18);"{40 SPACES}"SW$
10015 IFZ=1THENPRINTTAB(5);CT;TAB(16);C+1;T
  AB(27);C+2:GOTO10020
10019 PRINTTAB(5);C;TAB(16);C+1;TAB(27);C+2
10020 IFCW>2THENPRINT"(CRSR UP)"TAB(38);C+3
  ;TAB(49);C+4;TAB(60);C+5;TAB(71)C+6
10023 FORR=1TOCW:PRINTTAB(2+11*R);DA$(RD,C+
  R);:NEXT
10024 PRINT
10027 FORR=1TOCW:PRINTTAB(2+11*R);DA$(RT,C+
  R);:NEXT
10028 PRINT
10060 FORRR=1TOCW:PRINTTAB(2+11*RR);DA$(R,C
  +RR);:NEXT
10070 PRINT
```

—JIM BORDEN, CARLISLE, PA

### DEBUGGING AID

I enjoy debugging programs, but clearing the screen, listing the offending line and then moving the cursor to make the correction is nothing but drudgery. Adding a few lines to my programs has restored the good times.

Line I0 traps the error and directs control to line 63000, which clears the screen below the cursor and prints the error message. Then line 63010 positions the cursor at the beginning of the offending line, with the error underscored (80-Column mode) or in reverse (40-Column mode). The only thing left for me to do is move the cursor to the error and correct it.

```
1 REM 128 DEBUG AID-EDWARD HORGAN
10 TRAP 63000
20 THIS IS AN INTENTIONAL ERROR
30 END
63000 PRINT CHR$(27)"@ERR$(ER)
63010 HELP:PRINT"{4 CRSR UPS}":END
```

—EDWARD HORGAN, COATESVILLE, PA

### SPRITES IN ML

As programmers are well aware, programming sprites in machine language on the C-128 can be a headache. To gain complete control over the sprites and sound, consult *C-128 Internals*, published by Abacus Software (Book 1 in its 128 series). It provides the information you need. Just turn off bit 0 of location \$0A04 (2564), and the Basic sprite and sound IRQ will be ignored. Be sure to store the sprite image in a safe location in the C-128. The block from \$0E00-\$0FFF (3584-4095) is normally used to store sprites.

—JIM BORDEN, CARLISLE, PA ▶



## AUTOMATIC LOAD/RUN MENU

Imagine loading and running any disk-based program without typing in the Load and Run commands and the filename. This three-liner uses only the shifted run-stop and return keys to load and run programs.

Save my program as the first program on your disk. Then, each time you use the disk, press shifted run-stop to display the directory on the screen, move the cursor to the line with the program you want to run and press return. *Presto!* Your program loads and runs like magic! If your menu fills more than one screen, press the stop key, type CONT, press return and repeat the procedure above.

I added screen colors to the automen program; you may change the color values to suit your tastes.

```
10 PRINT "{SHFT CLR}"CHR$(27)"M":REM 128 MEN
  U LOAD-LON D. OLSON
20 SCNCLR:BG=16:BO=15:CH=12:COLOR0,BG:COLOR
  4,BO:COLOR5,CH:DIRECTORY:INPUTA$:I=0
30 I=I+1:B$=MID$(A$,I,1):IFB$=CHR$(34)THEN4
  0:ELSE GOTO30
40 I=I+1:C$=MID$(A$,I,1):IFC$=CHR$(34)THENP
  RINTCHR$(27)"L":RUN (D$):ELSE D$=D$+C$:G
  OTO40
```

—LON D. OLSON, MESA, AZ

## CUSTOM CHARACTERS

Here's help for those of you who use custom characters on the C-64 but are having trouble with them on the C-128. To use them on the 128, you must first copy the ROM character set at locations 53248-55295 into RAM at 14336-16383 and then set bits 1, 2 and 3 of location 2604 to 1. This tells the 128 to look for characters beginning at 14336 in RAM.

Since Basic uses the area where the RAM characters will be, you need a GRAPHIC1:GRAPHIC0 command to move the start-of-Basic above this area and switch back to 40-Column mode. Don't use a hi-res screen, or the character set will be ruined.

The following program redefines the @character to an up arrow.

```
10 REM 128 CUSTOM CHARS-NELSON SEARCY
20 GRAPHIC1:GRAPHIC0:REM FOR 40 COL ONLY
30 POKE 2604,30:POKE217,4:FAST
40 BANK14:FOR A=53248 TO 55295:B=PEEK(A):PO
  KEA-38912,B:NEXT:BANK0:SLOW
50 FORA=14336 TO 14343:READ B:POKEA,B:NEXT:
  REM "@ TO {UP ARROW}"
60 DATA 0,24,60,126,24,24,24,24
```

—NELSON SEARCY, FOREST CITY, NC

## FANCY SCREEN CLEARS

My program contains a number of subroutines to clear your C-128's screen in fancy ways. Line 200 in the program fills the screen to demonstrate the effect; you need to eliminate that line in your programs.

```
0 REM C-128 40-COL SCREEN CLR - RAY SONIER
10 PRINT "{2 HOMES}"{SHFT CLR}":CHAR 1,15,1,"
  ENTER 1-7"+CHR$(13)
15 GETKEY A$:Z=INSTR("1234567",A$):ON Z GOT
  O 20,30,40,50,60,70,80:GOTO15
20 GOSUB200:FOR A=0TO19:WINDOW 19-A,0,20+A,
  24,1:NEXT:GOTO10
```

```
30 GOSUB200:FOR A=0TO12:WINDOW 0,12-A,39,12
  +A,1:NEXT:GOTO10
40 GOSUB200:X=24:FOR A=35 TO 0 STEP-5:X=X-3
  :WINDOW A,X,39,24,1:NEXT:GOTO 10
50 GOSUB200:X=0:FOR A=4TO39 STEP5:X=X+3:WIN
  DOW 0,0,A,X,1:NEXT:GOTO10
60 GOSUB200:FOR A=0TO12:WINDOW 12-A,12-A,27
  +A,12+A,1:NEXT:GOTO10
70 GOSUB200:FOR A=0TO39:WINDOW A,0,A,24,1:N
  EXT:WINDOW 0,0,39,24,0:GOTO 10
80 GOSUB 200:FOR A=0TO39:WINDOW39-A,0,39-A,
  24,1:NEXT:WINDOW 0,0,39,24,0:GOTO 10
200 FOR X=1TO25:PRINT"*****"
  *****":NEXT:RETURN
```

—RAY SONIER, BREMERTON, WA

## MULTIPLE DIRECTORIES

I've got an easy way to put two directories side by side on the 80-column screen. First, clear the screen, then issue a Directory command for the first disk. Home the cursor and press the tab key five times. Next, press ESC T to set the top of a new window. Put your second disk in the drive and ask for a directory again. The directories will appear side by side. You can also use this procedure to compare program lines.

—AL BLAKEY, BARRE, VT

## INSTANT DIRECTORY DISPLAY

I have a way to instantly call up a directory display without interrupting any work I'm doing in 64 mode. Before going to 64 mode, I load the disk directory I'll be working with to the 128's 80-column screen. When I need to view the directory, I simply switch my monitor to 80-Column mode.

—AL BLAKEY, BARRE, VT

## EASY TEMPORARY SAVES

When you're typing in program listings, it's a good idea to save the program lines to disk every 15 minutes or so. I like the way Perfect Typist saves programs for me by adding this line to it:

```
9 KEY1,"SC{SHFT R}" + CHR$(34) + "Z" + CHR$(34) +
  "D{SHFT S}" + CHR$(34) + "Z" + CHR$(13)
```

When you press the F1 key, answer the prompt with a Y and press return. Perfect Typist will replace the old version of the program you saved with the new version and the filename Z. After you've finished typing in the program, use the Rename command to change the program's name to one that's more descriptive.

If you'd like to make the scratch automatic, use the following line instead:

```
9 KEY1,"SC{SHFT R}" + CHR$(34) + "Z" + CHR$(34) +
  CHR$(13) + "Y" + CHR$(13) + "D{SHFT S}" +
  CHR$(34) + "Z" + CHR$(13)
```

—M/SGT. JOHN R. STEVENSON, APO NEW YORK, NY

## ML MONITOR HARD COPY

The *C-128 System Guide* doesn't outline a method for printing hard copies from the built-in monitor. Use the following steps to get a printout.

First list the machine language program you want to print out and note the sections you want to disassemble or dump



## MAGIC

as memory. Exit the monitor with the X key, then type in OPEN 4,4:CMD 4,"";MONITOR. Send the sections, along with the starting and ending addresses, to the printer by typing in D for Disassembly or M for Memory dump. After all sections are listed, exit the monitor and type PRINT#4:CLOSE4 to restore the screen as the output device.

If your video monitor or TV is the 40-column-only type, the memory dumps will only print eight bytes per line to the screen and printer. You can use ESC X to switch to 80-Column mode and type the memory dump addresses without seeing what you type. This will print 16 bytes per line on the printer. Be careful typing, since you can't see the 80-column text with a 40-column-only video monitor.

—FRANK HARBIN, MOBILE, AL

### PARTIAL DIRECTORIES

When I want to print part of a disk directory that I've just loaded, I first enter the Renumber command, list the directory and delete any unwanted text. Then I print it out with OPEN4,4:CMD4:LIST. The only disadvantage is that the block count for the files will be incorrect.

—ADAM KAPLAN, ADDRESS UNKNOWN

### CUT-AND-PASTE C-128 BASIC EDITING

Modifying the C-128's screen editor with the line below enables your computer to "cut out" part of one program line and "paste" it into another. Type:

```
KEY 1,CHR$(27)+"P{5 CRSR LFs}KEY4,"+CHR$(34)+CHR$(13)
```

and press return. Now move the cursor to the character before the text you want to grab and press F1. Then move the cursor to the point you want to insert the text and press F4. The text will pop into place.

Keep in mind that the text you want to move cannot contain quotes, and it must start at column 6 or beyond to allow the KEY4, command to fit in front of the text.

—CONSTANTINO GROSSE, PHILADELPHIA, PA

### ELECTRONIC STAMP PAD

This program draws any set of one to eight sprites on a high-resolution screen. Use a joystick in port 2 to position the sprite on the screen and press the fire-button to copy it to the screen. When you're finished, press the space bar to select another sprite, or select sprite 0 to exit the program. When prompted for the template name, enter the name of a binary file containing the desired sprite shapes.

```
10 REM STAMPER 2/15-MATTHEW THIE
20 PRINT "{SHFT CLR}":GRAPHIC1,1:GRAPHIC0:DI
IRECTORY
30 INPUT "{CRSR DN}TEMPLATE NAME";TN$:BLOA
D(TN$)
40 PRINT "{SHFT CLR}":E=40:FORQ=1TO8:SPRI
TEQ,1,7,1,0,0,0:MOVSPR Q, E, 50:E=E+32
:NEXT
50 PRINT "{3 CRSR DN}{3 SPACES}1{3 SPACES}
2{3 SPACES}3{3 SPACES}4{3 SPACES}5{3 SP
ACES}6{3 SPACES}7{3 SPACES}8"
60 INPUT "{2 CRSR DN}SPRITE NUMBER (1-8) 0
TO QUIT";SN:IFSN<0ORSN>8THEN60
70 IF SN=0THENGRAPHIC0:FORU=1TO8:SPRITEU,0
:NEXT:END
```

```
80 GRAPHIC1:SPRSAV SN,B$
90 IFJOY(2)=1ANDTY>0THENTY=TY-10
100 IFJOY(2)=7ANDTX>0THENTX=TX-10
110 IFJOY(2)=5ANDTY<190THENTY=TY+10
120 IFJOY(2)=3ANDTX<310THENTX=TX+10
130 IFJOY(2)=128THEN GSHAPE B$,TX,TY
140 GETA$:IFA$=CHR$(32)THENGRAPHIC0:GOTO60
150 MOVSPR SN,TX+24,TY+50:GOTO90
```

—MATTHEW THIE, INDIANAPOLIS, IN

### ENGINEERING DISASTER

Run this program to see a picture of an object that cannot exist in three dimensions. It's a classic illustration of engineering gone wild!

```
0 REM IMPOSSIBLE BLOCK-THOMAS SMITH
10 COLOR1,7:COLOR0,2:GRAPHIC1,1:CIRCLE,58,
158,11,9
20 CIRCLE,111,158,11,9: CIRCLE,162,158,11,
9
30 DRAW,49,153TO180,60TO273,60TO151,154
40 DRAW,174,160TO273,80TO273,60
50 DRAW,70,160TO184,75TO234,75TO123,160
60 DRAW,100,153TO184,90TO184,75:DRAW,184,9
0TO215,90
```

—THOMAS B. SMITH, GALLIPOLIS, OH

### SPRITE PRINTER

If you need an enlarged version of your sprite images on hard copy, just load your sprites and run this program.

```
0 REM SPRITE PRINTER-M.G.HAGELSIEB
10 FORI=2816TO2933:READA:POKEI,A:C=C+A:NEX
T:IFC<>14000THENPRINT"CHECK DATA!":END
20 INPUT "{SHFT CLR}SPRITE #";S:S=3520+S*64
:GOSUB60:POKE2827,D:POKE2831,B:S=S+63:G
OSUB60
30 INPUT"SCREEN OR PRINTER (S/P)";P$:IFP$=
"P"THENOPEN4,4:CMD4
40 POKE2914,D:POKE2923,B:SYS2816
50 IF P$="P"THEN PRINT#4:CLOSE4:END: ELSE
END
60 B=INT(S/256):D=S-256*B:RETURN
70 DATA 169,0,141,116,11,169,7,141,117,11,
169,128,133,252,169,14,133,253
80 DATA 172,116,11,177,252,141,118,11,169,
7,141,117,11,173,118,11,24,10,141
90 DATA 118,11,176,8,169,32,32,210,255,76,
54,11,169,35,32,210,255,206,117
100 DATA 11,174,117,11,224,255,208,223,238
,116,11,173,116,11,201,3,208,23
110 DATA 169,0,141,116,11,24,169,3,101,252
,133,252,165,253,105,0,133,253,169
120 DATA 13,32,210,255,169,191,197,252,240
,3,76,18,11,169,14,197,253,240,3
130 DATA 76,18,11,96,0,255
```

—MARCOS GLEZ. HAGELSIEB,  
GUADALAJARA, JALISCO, MEXICO ▶



# MAGIC

## HELP-KEY CAUTION

The reverse-video highlight on the 40-column Help display can cause a problem within quotes. To see why, run this program:

```
10 B$=" BELL"  
20 R$="RING"+B  
30 PRINT R$
```

Now press the help key, move the cursor up to line 20 and add a \$ after the letter B. Press return and run the program again to see what happens. Use the help key to find the error, but list the line to edit it in 40-Column mode.

—JACK NORVELL, MEMPHIS, TN

## QUICK FUNCTION KEY DISABLE

Entering a single Poke command will convert your C-128's function keys to the C-64's function key values. To perform this magic, enter the incantation POKE828,183. It will change the vector that's used to interpret all function keys. The Get command will now return the regular values for the C-64, but the run key will give an ASCII value of 131 and the help key will give a value of 132. Enter POKE 828,173 to get back your old definitions.

—CHARLES LAVIN, CORAL GABLES, FL

## DIRECTORY NAME ARRAY 128

I liked the C-64 version of the Directory Name Array (see page 42) so much that I wrote this version for the C-128. In addition, I added a variable F\$ for pattern matching.

```
5 REM C128 DIR READ—JON R CURTIS  
10 FORI=3072TO3279:READX$:X=DEC(X$):POKEI,  
X:T=X:NEXT  
15 IF T<>28041 THEN PRINT"DATA ERR.":END  
20 POKE58,243:CLR:F$="$":X=LEN(F$)  
25 FORI=1TOX:POKEI+3282,ASC(MID$(F$,I)):NE  
XT:POKE3082,X  
30 DATA 169,14,162,8,160,0,32,186,255,169,  
1,162,211,160,12,32,189,255,32,192  
35 DATA 255,162,14,32,198,255,160,0,140,21  
0,12,132,250,140,209,12,165,50,133  
40 DATA 254,24,165,49,105,7,144,2,230,254,  
133,253,169,0,133,251,169,243,133,252  
45 DATA 160,1,32,207,255,166,144,240,13,32  
,204,255,169,14,32,195,255,174,209,12  
50 DATA 202,96,192,6,144,54,201,34,208,10,  
173,210,12,73,1,141,210,12,16,40,174  
55 DATA 210,12,208,39,192,32,208,31,169,25  
3,141,185,2,165,250,162,1,160,0,32  
60 DATA 119,255,132,250,136,24,165,253,105  
,3,144,2,230,254,133,253,76,192,12  
65 DATA 200,76,61,12,140,208,12,160,0,162,  
251,142,185,2,162,1,32,119,255,165  
70 DATA 250,208,25,160,1,165,251,162,253,1  
42,185,2,162,1,32,119,255,200,165,252  
75 DATA 162,1,32,119,255,238,209,12,230,25  
0,172,208,12,230,251,208,2,230,252  
80 DATA 192,255,240,3,76,104,12,200,240,24  
0  
85 :  
90 DIMA$(145):SYS3072:RREG,N  
95 FORI=1TON:PRINTA$(I):NEXT
```

As with the C-64 version, the array that stores the directory must be the first array dimensioned. In my demo, A\$(0) contains the disk name with the filenames starting in A\$(1). The number of filenames is passed to Basic with the RREG,N command. Be sure to use a comma before the variable.

—JON R. CURTIS, CENTRAL POINT, OR

## 3. DISK OPERATION/RECORDING

### EASY LOAD AND RUN

I've found a quick and easy way to load and run a Basic program on any Commodore computer:

```
LOAD "filename",8:{SHFT/RUN-STOP}
```

When you press the shift/run-stop combination, which stores the Run and Return commands in the buffer, your program will run automatically.

If you use this trick to load programs from the directory, the programs must begin with a line 0.

—CARLOS VILLALPANDO, WESLACO, TX

### SHORTEST FILE-READER

Here's a one-liner for reading sequential files. It should work with any Commodore computer. In the line below, change "filename" to the name of your sequential file and type in RUN. It will open the file, display its contents on the screen and close the file when finished.

```
1 REM FILE READER—R. W. BENJAMIN  
2 OPEN8,8,8,"FILENAME":FORI=0TO1:GET#8,A$:  
I=ST:PRINTA$;:NEXT:CLOSE8:END
```

—ROBERT W. BENJAMIN, WYSOX, PA

### MORE AUTOMATIC AUTO MENU

Those of you who use Auto Menu (*RUN*, April 1986) to load and run your programs might want to make it self-running by modifying it with the Auto-Run program (*RUN*, January 1986). By making Auto Menu a self-running program, you need only enter LOAD"AUTO MENU",8,1. The program will then run itself and allow you to load and run other programs with a single keystroke.

—EDDIE L. PHIPPS, MOORE, OK

### DISK FILE COUNTER

Usually a disk fills to capacity long before its directory does, but if you've saved many short files, you may not know how full the directory actually is. If you use my program to read your disk directory and count the number of files, you'll know when to start using a fresh disk.

```
10 REM FILE COUNTER—LEO BRENNEMAN  
20 PRINT"{SHFT CLR}":OPEN1,8,15,"I0":Z$=C  
HR$(0)  
30 OPEN 2,8,2,"#":S=1  
40 PRINT#1,"U1:";2;8;18;S  
50 GET#2,T$,S$:T$=T$+Z$:S$=S$+Z$  
60 FORI=2TO226STEP32  
70 PRINT#1,"B-P:";2;I  
80 GET#2,A$:IFA$<>"" THEN N=N+1:GOTO110  
90 GET#2,A$,A$  
100 FORJ=1TO16:GET#2,A$:NEXTJ
```



```
11Ø NEXTI
12Ø T=ASC(T$):S=ASC(S$):IFT>ØTHEN4Ø
13Ø CLOSE2:CLOSE1
14Ø PRINT"(3 SPACES)THERE ARE"N"FILES ON T
HIS DISK."
```

—LEO W. BRENNEMAN, ERIE, PA

## SAVE TIME BY SAVING TO SIDE B FIRST

Using a disk that's been formatted in 1571 mode theoretically saves time by eliminating the need for disk swaps when you save and access data files. However, in reality, the time advantage is lost, because when the drive program is saving to side B, it has to check the block allocation map (BAM) on side A after writing every block.

To overcome this problem, format a new disk and then run my BAM Filler program, which allocates all blocks on side A (except the directory). Then save the main program and support files to side B. Finally, use the Collect command to free side A once again.

Wait until after Collect finishes executing to put an autoboot program on the disk. Otherwise, it will free the autoboot block.

```
1Ø REM SIDE A BAM FILLER-IAN PEARSE
2Ø NU$=CHR$(Ø)
3Ø OPEN15,8,15,"IØ":OPEN8,8,8,"#":PRINT#15
,"UA:8,Ø,18,Ø"
4Ø PRINT#15,"B-P:8,4":FORX=4TO71:PRINT#8,N
U$;:NEXT
5Ø PRINT#15,"B-P:8,76":FORX=76TO143:PRINT#
8,NU$;:NEXT
6Ø PRINT#15,"UB:8,Ø,18,Ø":PRINT#15,"IØ":CL
OSE8:CLOSE15
```

—IAN W. PEARSE, EARLVILLE, QLD., AUSTRALIA

## SCRATCHING WITH WILD CARDS

If you intend to scratch several files beginning with the same few characters by using a wild-card character (\* or ?), it's easy to see which files will be scratched by using the same character with the DOS Wedge or the Directory command. For example, if you're thinking of scratching all files whose names start with FILE, use @\$:FILE with the Wedge, or type in DIRECTORY "FILE\*" on the C-128. Then you can go ahead and use the wild card, or individually scratch only those files you really want to eliminate.

—IAN W. PEARSE, EARLVILLE, QLD., AUSTRALIA

## 1541 VS 1571 SECTOR INTERLEAVE

I write C-64 programs on both the C-64 and C-128, with 1541 and 1571 disk drives. When I use fast-loaders, C-64 programs that I've saved with a 1571 drive require nearly twice as much time to load as those saved with a 1541 drive.

Investigation showed that the blocks in the 1541-saved files were separated by ten blocks (interleave = 10), while blocks in the 1571-saved files were separated by six blocks (interleave = 6). Typically, a 1541 fast-loader program can transfer *two* blocks of a program to the computer with each revolution of the disk. When programs are saved with a 1571, however, the blocks are too close, and the fast-loaders can read only *one* block per revolution.

In 1571 mode, the drive is fast enough to pick up three

blocks on each spin. Unfortunately, the default interleave is 6 in both 1571 and 1541 modes. Fortunately, you can change the interleave default with this program line:

```
1Ø REM 64/1571 INTERLEAVE-RAY ROBERTS
2Ø OPEN 15,8,15:PRINT#15,"M-W"CHR$(1Ø5)CHR
$(Ø)CHR$(1)CHR$(1Ø):CLOSE15
```

The final CHR\$ value is the interleave value, in this case, 10. If you use this line before saving programs on a 1571, your C-64 fast-loaders will work at full speed. However, using this line for 128 programs will make them load more slowly in 1571 mode.

—RAY ROBERTS, GAINESVILLE, FL

## 1541 DOS WEDGE COMMAND SUMMARY

Many new C-64 users may not be aware of the full usefulness of the DOS Wedge utility that comes on the demo disk supplied with the disk drive. Here's a summary of the commands available with this very handy utility. Refer to the drive manual for a full explanation of the DOS commands. Note, however, that not all the DOS Wedge commands listed here are covered in the older manuals.

- @—Returns the current disk status.
- @\$—Lists the directory to the screen without disturbing the program in memory. (Note: Tap the space bar to stop and start the directory.)
- @IØ—Initializes the disk drive.
- @UJ—Software reset for the DOS.
- @VØ—Validates disk.
- @#N (where N is the drive number 8 to 15)—If you have two or more drives, this command lets you switch the DOS Wedge commands back and forth between drives (@#9 will send DOS Wedge commands to drive 9).
- @NØ:DISK NAME,ID—Formats a disk. (*Warning:* This command destroys all data on a disk.)
- @CØ:NEW FILENAME=Ø:OLD FILENAME—Makes a copy of old file on the same disk under new filename.
- @RØ:NEW NAME=Ø:OLD NAME—Renames a file on the disk.
- @SØ:FILENAME—Scratches a file from the disk.
- FILENAME—Loads a Basic program.
- !FILENAME—Loads and runs a Basic program.
- %FILENAME—Loads a program back into memory to the exact place it was saved from. (For binary files such as DOS 5.1.) Note: The last three commands above can be used in a directory listing by typing the first character in the first column and pressing return; the Wedge will only see the filename within quotes and ignore any other characters on the line!
- FILENAME—Saves a program to disk.
- @Q—Disables the DOS Wedge program.

Note that > can be used instead of @. Also, to use DOS Wedge commands in a program requires a different syntax. First type the @ and then include the command within quotes. For example, 10 @"IØ" will initialize the drive (assuming the Wedge is active).

—DON GRIFFEY, HOPKINSVILLE, KY

## NEW FIRST FILE

After you have a number of files on a disk, you might find that you want to place the file you use the most first in the directory. When it's in that position, you can load the file after turning on your computer by entering LOAD"\*",8—without having to type the filename. The program below will let you swap the first file in a directory with any other file



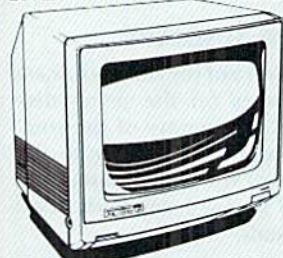
PRICES MAY BE LOWER! . . . \$CALL

# commodore

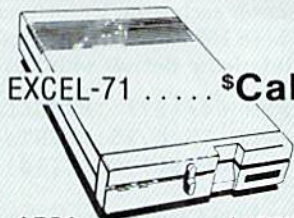


64c ..... \$129<sup>95\*</sup>  
 128 ..... \$189<sup>95\*</sup>  
 128D ..... \$429<sup>95\*</sup>  
 C64 . . . (REFURBISHED) \$99<sup>95\*</sup>  
 \*package pricing

2002A ..... \$CALL



1901 (monochrome)....\$99<sup>95</sup>  
 1802c..... \$189<sup>95</sup>  
 1902A..... \$239<sup>95</sup>



EXCEL-71 ..... \$Call

1581 ..... \$179<sup>95</sup>  
 1541c..... \$169<sup>95</sup>  
 1571 ..... \$219<sup>95</sup>



OKIMATE 20... \$99<sup>95\*</sup>  
 1351 ..... \$39<sup>95</sup>  
 Plug & Print ..... \$CALL  
 Roland Plotters..... \$Call  
 1764 RAM ... \$125<sup>00</sup>

COMPLETE AMIGA LINE . . . \$CALL



# AMIGA 500 SPECIAL PROMO!

USER GROUPS  
 PACKAGE A ..... \$89<sup>95</sup>  
 PACKAGE B..... \$179<sup>95</sup>

GENLOCK ... \$220<sup>00</sup>

DIGI-VIEW \$120<sup>00</sup>

1010DRIVE ... \$200<sup>00</sup>  
 40 MEG ... \$900<sup>00</sup>

1680MODEM... \$120<sup>00</sup>

512K RAM \$120<sup>00</sup>

2 MEG \$349<sup>95</sup>  
 20 MEG \$649<sup>95</sup>

256K ..... \$80<sup>00</sup>

MARAUDER II \$24

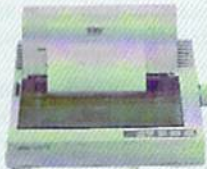
1 MEG WITH CLOCK \$260<sup>00</sup>

AUTHORIZED AMIGA SALES & SERVICE  
 G064 EMULATOR..... \$99<sup>95</sup>

# star micronics PRINTERS



star micronics \*124<sup>95</sup>  
 NP-10

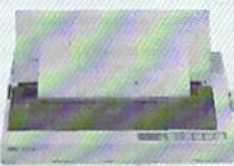


star micronics \*149<sup>95</sup>  
 NX-10

NB2415 • NR15 • LASERS • \$CALL



star micronics \*379<sup>95</sup>  
 NB-2410



star micronics \*279<sup>95</sup>  
 NX-15  
 OTHER 15" STAR PRINTERS FROM \$230

\*WITH PURCHASE OF TWO RIBBONS

# commodore IBM COMPATIBLE



- 512K
- 360K Dual Sided Drive
- CGA Board
- One year warranty
- Parallel Port
- Serial Port
- GW BASIC
- DOS 3.2

FREE SIDEKICK BY BORLAND

PC10-1

PRICES MAY BE LOWER!

DUAL DRIVE 640K

PC10-2

\$474<sup>95</sup>

\$CALL

\$574<sup>95</sup>

COMMODORE PC-AT...\$CALL

20 MEG...\$299<sup>95</sup>

Seagate w/controller  
 NEW PRICING . CALL

30 MEG...\$349<sup>95</sup>

ORDERS ONLY 800-433-7756

IN MICH. 313-427-7713

CUSTOMER SERVICE 313-427-0267 M-F 10-6

Monday thru Friday - 10:00 A.M. to 8:00 P.M.

Saturday - 10:00 A.M. to 6:00 P.M. (E.S.T.)

SCHOOL P.O.'s ACCEPTED CALL FOR TERMS

DEALER INQUIREES INVITED

# M.C.S.

MICROCOMPUTER SERVICES

No Surcharge for MC/VISA/DISCOVER Sorry no walk in traffic  
 All returns must have RA# Merchandise found defective will be repaired or replaced. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product performance. Any money back guarantee must be handled directly with the manufacturer. Call for shipping & handling info. Prices subject to change without notice.  
 12864 FARMINGTON ROAD, LIVONIA, MI 48150 We cannot guarantee compatibility.



**WAREHOUSE CLEARANCE SALE!**  
MANY ITEMS BELOW COST!

**NEW** **Panasonic Industrial Company** **NEW**

120 C.P.S. **\$139.95\*** KX-PI080i

160 C.P.S. **\$179.95\*** KX-P1091i

**W/2 RIBBON PURCHASE\***

LASER SCALL **\$279.95\*** KX-P1092i (240 C.P.S.)

**\$379.95\*** KX-P1592 (180 C.P.S.)

1080 i-ii 1091 i-ii SCALL

**SEIKOSHA**  
• w/2 ribbon purchase

SP180VC **\$129.95\***

300CPS...275" **\$139.95\*** SP1000VC

**ALPS ALQ200**  
24PIN/COLOR  
240 C.P.S. DRAFT 1YR. WARRANTY **\$399.95**  
80 C.P.S. L.Q. EPSON/IBM COMPATIBLE

**Avatex**

1200 Baud ... **\$79.95\***

1200 Internal ... **\$99.95**

1200 H.C. .... **\$99.95\***

2400 Baud. ... **\$199.95\***

\*w/cable purchase

**DISKS & ACCESS.**

3 1/2 DS/DD (30 lot) **\$1.30**

3 1/2 SS/DD (30 lot) **\$1.00**

3 1/2 DS/DD (30 lot) **\$1.30**

CAUSE PAD **\$6**

CASIO CZ101 **\$250**

CASIO 700. **\$300**

**NAME BRAND**  
GENERIC 5 1/4 DS/DD  
LIFETIME WARR. **25¢** (100 Lot Qty.)

3 1/2 DISK CASE (30) **\$8**

5 1/4 DISK CASE (75) **\$8**

DISK HEAD CLEANERS **\$8**

1750 RAM **\$160**

**SPECIALS**

Printer Cable For GEOS **\$19.95**

Canon Color Ink Jet **\$299.95**

Joy Sticks **from \$5**

Printer Muffler **\$49.95**

**CLOSEOUT**  
Computers • Monitors • Printers  
1-of-a-kinds • Discontinued • Far Below Cost  
**SCALL**  
Software From \$1.29

**Commodore**

**Educator 64**  
**\$149.95\***

Completely Commodore Compatible

**Commodore**

**SFD 1001 (1 Meg)**  
**\$149.95\***

\*PACKAGE PRICING

**FSD-2**

- Quieter
- Cooler
- 1 yr Warr

**\$149.95\***

\*Package Pricing

**Commodore**

**Hard Drives 9060**  
**\$450\***

XETEC/I.C.T. CALL

**Commodore**

**MPS 8023**  
160 C.P.S. 15" **\$99.95\***

Limited Qty.  
\*Completely Refurbished

**AMIGA NEW RELEASES**

Terrapods	\$ 24	Dark Castle	\$ 24	Deluxe Print II	\$ 48	Earl Weaver Baseball	SCALL
GEN-LOCK	\$108	Sculpt 3D	\$ 60	Word Perfect	\$240	Lounge Lizards	\$ 30
Ferrari Formula	\$ 30	Gold Runner	\$ 24	Laser Script	\$ 27	Page Flipper	\$ 30
Fairy Tale Adv	\$ 30	Calligrapher	\$ 60	Surgeon	\$ 36	Videoscape 3D	\$120

**ALL SOFTWARE AT LEAST 40% OFF**

**FREE T-Shirt with the purchase of any (2) Electronic Arts Productal White Supply Lists**

Bard's Tale	\$24.00
Bard's Tale II	24.00
Chessmaster 200	24.00
World Tour Golf	18.00
Marble Madness	18.00
Pegasus	18.00
Mobius	24.00
Murder Party	21.00
Ogre	24.00
Ultima IV	36.00
Auto Duel	30.00
Scrabble	21.00
America's Cup	21.00
Artic Fox	24.00
All Classics	9.00
Amnesia	24.00
Bismark	21.00
Chuck Yeager	21.00
Tobruk	21.00
Paper Clip III	30.00
Outrageous Pages	30.00
Clue Books	SCALL

**MINDSCAPE**

Defender of the Crown	\$21.00
Bop and Wrestle	18.00
Super Star Hockey	21.00
High Roller	18.00
Indoor Sports	18.00
Infiltrator	18.00
Parallax	18.00
Urdium	18.00

**ACCOLADE**

Hard Ball	\$17.00
Apollo	SCALL
Test Drive	SCALL
Ace of Aces	18.00
Comics	18.00

**Berkeley Software**

GEOS	\$34.00
GEOS Fontpak 1	18.00
GEOS Desk Pack	21.00
Writer Work Shop	30.00
Geodex	24.00
GeoCalc/GeoFile	30.00
GeoCable	24.00
GEOS 128	SCALL
Geopublish	35.00
Geoprogrammer	SCALL

**Abacus**

Abacus Books	\$5AVE
GEOS In and Out (Disk)	9.00
Basic 128	36.00
Basic 64	24.00
Cadpak 128	36.00
Cadpak 64	24.00
Chartpak 128	24.00
Chartpak 64	24.00
Cobol 64	24.00
Cobol 128	36.00
Super C Compiler 64/128	36.00
Super Pascal	36.00

**ACCESS**

MACH-128	\$28.50
Leaderboard	24.00
Echelon	27.00
World Class Leaderboard	22.50
10th Frame	24.00
Exec Tournament	12.00
Tournament 1	12.00
Triple Pak	12.00
Famous Course	12.00

**ACTIVISION**

Portal	\$24.00
Titanic	18.00
Labrynth	21.00
Aliens	21.00
Last Ninja	SCALL
Hacker II	21.00
Top Fuel Elim	SCALL
Game Maker	24.00
Music Studio	18.00
Maniac Mansion	SCALL

**SPRINGBOARD**

Certificate Maker	\$28.00
Newsroom	30.00
Clip Art 1	18.00
Clip Art 2	24.00

**MicroProse**

Knight Ork	\$24.00
Golden Path	SCALL
Pawn	24.00
Talking Teacher	24.00
Guild of Thieves	24.00

**UNISON WORLD**

Art Gallery	\$16.00
Art Gallery 2	16.00
Print Master	21.00

**PRECISION**

Superbase 128	\$60.00
Superbase 64	48.00
Superscript 128	48.00
Superscript 128	48.00
Visastar 64	SCALL
Visawrite 128	SCALL
Microlawyer	SCALL

**HI TECH**

Card ware	\$ 6.00
Heart ware	6.00
Party ware	6.00
Ware with all	9.00

**Broderbund Software**

Printshop	\$25.00
Graphics Lib	15.00
Carmen Sandiego	21.00
Karateka	18.00
Print shop comp.	21.00

**LOGIC**

Flight Sim II	\$28.50
Scenery Disk	12.00
Jet	30.00
Football	24.00
Baseball	30.00

**TIMEWORKS**

Data Mgr. 128	\$36.00
Swiftcalc 128	36.00
Wordwriter 3	36.00
All business titles	36.00
Partner 64	36.00
Partner 128	42.00
Sylvia Porters	36.00
Desktop Publisher	SCALL

**MicroProse**

Gunship F-15	\$20.00
Project Stealth Fighter	21.00
Airborne Ranger	24.00
Silent Service	24.00
Pirates	24.00
Top Gunner	18.00

**XETEC, Inc**

Font Master II 64	\$30.00
Font Master 128	36.00

**SSI**

Gemstone Healer	\$18.00
Gettysburg	36.00
Kampfruppe	36.00
Phantasia 2	24.00
Ring of Zelfin	24.00
Road War 2000	24.00
Shard of Spring	24.00
Wizard's Crown	24.00

**MONOPOLY**

Micro L. Baseball	\$24.00
General Mgr	24.00
Stat Disk	15.00
86' Team Disk	12.00

**Highland Industries**

Super Pack 64	\$36.00
Super Pack 128	45.00
Pocket Writer 2/Writer Planner	36.00
Super Pack 2 (128)	60.00
Pocket Writer 128/Writer Planner	30.00
Pocket Writer 64/Writer Planner	24.00

**EPYX**

FastLoad	\$22.50
Rad Warrior	36.00
Street Sports-Baseball/Basketball	24.00
World Karate Champ	15.00
Summer Games II	20.00
Super Cycle	24.00
World Games	24.00
Football	20.00
Multi-Plan	24.00
Winter Games	20.00
Sub Battle	24.00
California Games	24.00
Echelon	SCALL
Boulder Dash Construction	SCALL
Soy vs Spy III	SCALL

**NEW RELEASES**

Clue Books	SCALL
Star Dos	SCALL
Dan Dare	12.00
Dungeon Runners	18.00
Earth Orbit Station	18.00
Instant Music	6.00
Legacy of Ancient	18.00
Patton vs. Rommel	18.00
Skate or Die	18.00
Tomahawk	18.00
Monopoly	24.00
Mavis Beacon Piping	24.00
Mini Putt Golf	SCALL
King of Chicago	30.00
Thunder Chopper	18.00
Bop n' Rumble	18.00
NBA	SCALL
Fourth & Inches	SCALL
Nord and Bert	21.00
Mousetrap	12.00
Business Card Maker	SCALL

**NEW SOFTWARE/BOOKS ARRIVING DAILY \$CALL**



## MAGIC

on the disk. Try this program on a back-up disk first, to be sure it's typed in correctly. Otherwise, you could lose everything on the disk.

```
10 REM 1ST FILE-ANTHONY AGUIRRE
20 INPUT" NAME OF CURRENT FIRST PROGRAM ";
  F$
30 INPUT"NAME OF PROGRAM TO BE FIRST";P$
40 PRINT"VALIDATING DISK":OPEN15,8,15,"V0"
50 PRINT"SWAPPING FILES":F1$=F$+"":P1$=P$
  +". "
60 PRINT#15,"C0:"+F1$+"=0:"+F$:PRINT#15,"S
  0:"+F$
70 PRINT#15,"C0:"+P1$+"=0:"+P$:PRINT#15,"S
  0:"+P$
80 PRINT#15,"R0:"+P$+"=0:"+P1$:PRINT#15,"R
  0:"+F$+"=0:"F1$
90 CLOSE15:PRINT"(2 CRSR DNS)ALL DONE!"
```

—ANTHONY AGUIRRE, HAVERTOWN, PA

### FILE-COPYING TIP

You can do a favor for both your disks and drive by using a file-copy, rather than disk-copy, program to copy files to a new disk. Here's why. When you use a disk-copy program to copy files, your drive spends a lot of time searching for free blocks to copy the files in the order in which they appear on the original disk. This results in greater wear and tear on the drive during the load and save process.

However, copying a disk with a file-copy program wastes no time searching for free blocks and reproduces the files in the same order as they appear on the original disk.

—ROBERT B. COOK, BRAINTREE, MA

### C-128 DIRECTORY RUN

Loading and running programs on your C-128 is easy with my method. Append your filenames with a shifted space and a shifted @ before you save them. Then, when you're ready to load and run a program, list the directory, move the cursor to the filename and press F6. That's all there is to it!

—FRANK KLEIN, SOUTH ELGIN, IL

### C-128 AND LOCKED FILES

Unlike the C-64, the C-128 can't load locked files. But you can get around this by first loading the locked file in 64 mode to unlock it, then copying the file to another disk. Now your unlocked copy is ready to load in C-128 mode. You can use the locked copy as a backup.

—L. M. LABAR, BETHLEHEM, PA

### 1571 DOUBLE-SIDE RESTORE

Use my program to restore to 1571 format any double-sided disk that you've unintentionally validated in 1541 mode.

```
10 PRINT"{SHFT CLR}FIX 1571 DISK AFTER 154
  1 MODE VALIDATE":REM BILL DEVOS
20 PRINT"INSERT 1571 DISK AND HIT RETURN"
30 GET A$:IFA$=""THEN30
40 OPEN15,8,15,"I0":PRINT#15,"U0>M1":GOSUB
  100
```

```
50 OPEN1,8,5,"#":PRINT#15,"U1:5 0 18 0"
60 PRINT#15,"B-P: 5 3":FX$=CHR$(128)
70 PRINT#1,FX$;:PRINT#15,"U2:5 0 18 0"
80 GOSUB 100:PRINT#15,"I0"
90 CLOSE1:CLOSE15:PRINT"DONE":END
100 INPUT#15,EN,EM$,ET,ES
110 IFEN<20THEN RETURN
120 PRINT"DISK ERROR!"
130 PRINT EN;EM$;ET;ES
140 CLOSE1:CLOSE15:END
```

—BILL DE VOS, CLIFTON, NJ

### A BETTER FILENAME

Here's a time-saver that will simplify your disk loads. Just add a two-character prefix to a filename, then type a shifted space and any remark you'd like, up to the 16-character limit.

Here's an example. Save the RUN Script boot program to disk with "WP{shifted space}RUN SCRIPT 128". It will appear as "WP"RUN SCRIPT 128 in the directory. As far as the disk is concerned, the file is named WP and can be loaded with LOAD "WP",8. Try it with several programs. I'm sure you'll like it!

—ERIC PEDERSEN, APO, NY

### RIGHT ON?

My Write-Protect Check checks the write-protect status of the disk in your drive. It's compatible with the 1541 or 1571 and any Commodore computer.

The program examines a byte in the drive's memory to determine whether the disk is write-protected. If it is, a message is printed and the computer will wait for you to remove the write-protect tab and press a key. After it checks again and finds the tab is off, it continues with the rest of the program. You can use this routine in any program that writes files to the disk.

```
10 REM WRITE-PROTECT CHECKER-NGHIA TRAN
20 OPEN 15,8,15
30 PRINT#15,"M-R"CHR$(30)CHR$(0)
40 GET#15,V$:V=ASC(V$+CHR$(1))
50 IF V=1 THEN 70
60 IF V=16 THENPRINT"TAB OFF":GOTO110
70 PRINT"PLEASE REMOVE WRITE-PROTECT TAB"
80 PRINT"PRESS ANY KEY WHEN READY"
90 GET B$:IF B$="" THEN 90
100 GOTO 30
110 CLOSE 15
120 REM -- YOUR PROGRAM STARTS HERE --
```

—NGHIA TRAN, PETALUMA, CA

## 4. PRINTERS/PRINTER OPERATION

### CUSTOM CHARACTERS ON STAR PRINTERS

Although the user manual accompanying Star printers is clearly written, one point is barely mentioned. When you're defining your own characters, DIP switch number five *must* be turned off. Turn the printer off, push DIP switch number five to the off position and then turn the printer back on (see the DIP switch section of your manual for your particular



## MAGIC

model). Now your characters will turn out fine!

—MIKE DRYJA, WASHINGTON, MI

### LETTER BOXES

This program prints a border along the edges of your posters and letters. First print the border (use  $8\frac{1}{2} \times 11$ -inch paper), then run the paper through a second time to print your text. It should work with any 1525-compatible printer and on other printers with a few changes to the program.

```
1Ø REM BORDER - TOM FONTANA
2Ø W=8Ø:H=1Ø7:W$=STR$(W-1)
3Ø W$=RIGHT$(W$,LEN(W$)-1)
4Ø CLOSE4:OPEN4,4,Ø
5Ø FORX=1TOW:TP$=TP$+"{COMD P}":NEXT
6Ø FORX=1TOW:BM$=BM$+"{COMD Y}":NEXT
7Ø PRINT#4,TP$CHR$(8):PRINT#4,CHR$(15);
8Ø FORX=1TOH:PRINT#4,CHR$(15)"{COMD J}"CHR
  $(16)W$"{COMD L}"CHR$(8):NEXT
9Ø PRINT#4,CHR$(15)BM$:CLOSE4
```

—TOM FONTANA, KANSAS CITY, MO

### C-128 ADDRESS LABELS SAVER

The standard  $3\frac{1}{2}$ -inch address labels are too big for the return address on small envelopes, so I wrote a program that prints the address twice in Condensed mode on the same label, to cut in half the size and number of labels you use.

You can input up to five lines per label. If you need just three lines, press return over the first and last lines. If your name or address is very long, change the value of the SPC(30) in line 120. A smaller number will print the two labels closer together.

```
1Ø REM MINI LABELS- MARY E. WILSON
2Ø PRINT CHR$(14):OPEN4,4,7:ES$=CHR$(27)
3Ø PRINT#4,ES$+"{SHFT B}" +CHR$(3);:REM COM
  PRESSED
4Ø PRINT#4,ES$+"Ø";:REM 1/8" SPACING
5Ø PRINT"{SHFT CLR}{2 CRSR DNs} IF COMMAS
  ARE DESIRED, ENCLOSE LINE IN QUOTES{2 C
  RSR DNs}"
6Ø INPUT"HOW MANY LABELS";N
7Ø FORZ=1TO5:PRINT"LINE"Z;:INPUTA$(Z):NEXT

8Ø PRINT"{2 CRSR DNs}IS THIS CORRECT? (Y/N
  )"
9Ø GET AN$:IFAN$<>"Y"ANDAN$<>"N"THEN9Ø
1ØØ IF AN$="N"THEN RUN
11Ø FOR I=1 TO N:PRINT#4
12Ø FORZ=1TO5:PRINT#4,A$(Z)SPC(3Ø-LEN(A$(Z
  )))A$(Z):NEXT Z
13Ø PRINT#4:PRINT#4:NEXT:CLOSE4
```

—MARY E. WILSON, CLEARWATER, FL

### VARIABLE TABS FOR ANY PRINTER

Tabs as they appear on the screen do not print out the same way on hard copy. The following program will show how to align columns at the right or the left. It will work with any printer or screen display.

```
1Ø REM PRINTER COLUMNS-GEORGE VOGLER
2Ø OPEN4,4:H=2Ø:REM COL WIDTH
3Ø FORI=1TO8:READ DA$:HT=H-LEN(DA$)
4Ø PRINT#4,SPC(HT)DA$SPC(H)DA$SPC(HT)". "
5Ø NEXT:PRINT#4:CLOSE4
6Ø DATA 2,1ØØ,2ØØ2,393939,55,5335,8,4321
```

The program prints four columns of data. The first column is left-justified, the second column is blank, the third is right-justified, with the "cursor" ready for the fourth column. The fourth column is just a "." to show that it is properly aligned. By using this method, your programs will work with any printer and any Commodore computer.

—GEORGE W. VOLGER, HOUSTON, TX

### C-64 EASY PRINTER CONTROL

My program adds two new commands to the Basic vocabulary to help you deal with the hassle of making your printer obey your computer.

The first command is \*P, which directs all output from the screen to the printer. It's equivalent to OPEN4,4,0:CMD4.

The second command is \*S, which redirects the output back to the screen. It's equivalent to PRINT#4:CLOSE4. The device number is the second 4 in line 80 and the secondary address is the 0 in line 80. These can be changed as required (along with the checksum value in line 20).

```
Ø REM OUTPUT CONTROL- GEOFFREY KERCHNER
1Ø C=Ø:FORA=49152TO49233:READB:POKEA,B:C=C
  +B:NEXT
2Ø IFC<>9125THENPRINT"DATA ERR.":END
3Ø SYS49152:PRINT"NEW COMMANDS:"
4Ø PRINT:PRINT"*P - OUTPUT TO PRINTER"
5Ø PRINT"*S - OUTPUT BACK TO SCREEN"
6Ø DATA 169,11,162,192,141,8,3,142,9,3,96,
  32,115,Ø,2Ø1,172,24Ø,6,32,121,Ø,76
7Ø DATA 231,167,32,115,Ø,2Ø1,8Ø,24Ø,7,2Ø1,
  83,24Ø,33,76,8,175,169,Ø,32,189,255
8Ø DATA 169,4,162,4,16Ø,Ø,32,186,255,32,19
  2,255,162,4,32,2Ø1,255,134,154,32,115
9Ø DATA Ø,76,174,167,162,4,32,195,255,32,2
  Ø4,255,32,115,Ø,76,174,167
```

—GEOFFREY KERCHNER, OAK RIDGE, TN

### PRINT QUALITY

I was very pleased with my printer's performance until I happened to notice that the print quality was very weak compared to the printers at my office. The ribbon deteriorates so slowly that it is often difficult to detect any change in print quality right away. I now keep a sample sheet printed with a new ribbon for comparison.

—DAVID M. PALO, ESCANABA, MI

## 5. VIDEO/AUDIO DEVICES

### CHECKING MONITOR RESOLUTION

The next time you shop for an 80-column monitor, test its resolution right in the store with this short program:

```
10 PRINT CHR$(14):FOR A=1TO40*23:PRINT",V";:NEXT ▶
```



## MAGIC

Enter the program and run it. The screen will fill with 23 lines of commas and lowercase v's. To check the resolution, look at the single pixel that forms the point of the center of the v or the tail of the comma. On a monochrome monitor the pixels should be a single round point of light. On a color monitor only one color should predominate, with only slight spilling of the primary colors (red, green and blue) at the edges of the display area. You might want to try different color combinations for the screen and text, too.

Since only one "gun" is used to produce the monochrome picture, the image is sharper and clearer than the color image. Remember that adjusting the brightness, contrast, color and tint also affects picture quality.

—PAUL L. HUBBARD, BALTIMORE, MD

### MONITOR HEARING AID

For about \$15, you can add sound to your video-only monitor with an audio cable plug, a Radio Shack amplifier-speaker (part # 277-1008B) and an adapter (part # 274-330).

—NELSON HAMBLIN, EDGAR, NE

## 6. ENTERING/EDITING PROGRAMS

### LINE MARKER

When I type in a program from *RUN*, I use a small sheet of Scotch Post-it pad to mark my place and to help my eyes follow the line I'm entering. This magic paper easily sticks to my magazine without damaging it, and I can restick the paper under the next line, then the next, and so on. Now I never skip lines while typing in a program.

—JOHN KIM, SPRING VALLEY, NY

### A SAFE SAVE-AND-REPLACE ROUTINE

Whenever I type in a long Basic program, I always begin the listing with this time-saving routine. Then, when I'm ready to update the program on disk or quit for the day, I just enter *RUN 2*. The routine will scratch the previously saved version and save the latest version. When the entire program is entered and tested, I add *:STOP* to the end of line 2, then I run line 2 one last time. Finally, I delete lines 1-3 and save the finished program in the usual way.

```
Ø REM SAFE SAVE+REPLACE - CHRISTINE N CHARN  
ETSKI  
1 GOTO [FIRST LINE #]  
2 N$="PROGRAM NAME":PRINT"SCRATCH";:OPEN1,8  
,15,"SØ:"+N$:CLOSE1  
3 PRINT" AND SAVE.":SAVE N$,8:END
```

—CHRISTINE N. CHARNETSKI, PLAINS, PA

### DISK MODE CHANGER

I write and edit C-64 Basic programs on the C-128 in 128 mode, but the 1571 disk drive can cause delays when it first tries to read the directory off some 1541-formatted disks. To operate in 1541 mode without the delays, type in my program. Use the F4 key to switch to 1541 mode and the F8 key to switch to 1571 mode. Press F1 to use the 40-column screen in Slow mode.

```
1 REM 1571/1541 MODE SELECT-L.L.PANKEY
```

```
1Ø KEY4,"OPEN1,8,15,"+CHR$(34)+"UØ>MØ"+CHR$(  
34)+":CLOSE1:FAST"+CHR$(13)  
2Ø KEY8,"OPEN1,8,15,"+CHR$(34)+"UØ>M1"+CHR$(  
34)+":CLOSE1:FAST"+CHR$(13)  
3Ø KEY1,"SLOW"+CHR$(13)
```

—L. L. PANKEY, DANA POINT, CA

### STARTING AT THE BOTTOM

The next time you use *RUN's* Perfect Typist program to check old listings, start at the end of the listing and work back to the beginning. Checking programs this way prevents the checksum from overwriting the line you check next. After checking the lines on the screen for accuracy, bring down the next group of lines by listing to the line at the top of the screen minus one. For example, if the top line is 5200, type *LIST - 5199*.

—CHING KO, MCPHERSON, KS

### CHECKING THE CHECKSUM

If you're typing in a program that contains Data statements and a built-in checksum, there's an easy way to check for errors without executing the program. Find the line that contains the Poke and delete it. Also put a Stop command just after the line that checks the value of the checksum. Then run the program.

If the checksum generates an Error message, find the mistake in the Data statements and make the needed changes, and then run the program again. If you get another error message, look for another mistake. When you run the program and get a Break message in the line that holds the checksum, you know your data is correct. Then type the Poke command (with variables) back in, remove the Stop command you added and save the program.

—STAN JONES, FAIRBANKS, AK

### BASIC REF STATEMENT

I've found that including the source of a program I've gotten from a magazine in a REM statement at the beginning of the listing saves me time when I need to reference the source. I include the name of the magazine, the issue and the page on which the program begins.

—RODNEY L. PRAEGITZER, APO, NY

### SCREEN EDIT TRICK

Here's a quick and simple way to move part of one line to merge with another line in a listing. Let's combine lines 10 and 40, below.

```
10 A=6:B=1:A$="XYZ"  
20 IF A$="" THEN 100  
30 X=Q*5+120  
40 C$="TO"
```

First, add a colon before the C\$ in line 40, move the cursor back to the colon and use the insert-delete key to put in enough spaces to move the colon just past the text you want to insert. Hit the return key. You should now have a display like this:

```
10 A=6:B=1:A$="XYZ"  
20 IF A$="" THEN 100  
30 X=Q*5+120  
40 :C$="TO"
```



## MAGIC

Now move the cursor to line 20 and list line 10. This will place line 10 in the blank spaces without erasing the original line 40 text. The screen should look like this:

```
10 A=6:B=1:A$="XYZ" LIST10
30 X=Q*5+120
10 A=6:B=1:A$="XYZ":C$="TO"
```

Now just move the cursor back up and type 40 over the 10 in your revised line and hit return. If the original line 10 is not needed, delete it.

This seems more difficult than it is. It'll come easy after you use it a few times.

—JEFF STAFFORD, ROCHESTER, IN

### EDITING CURSOR MOVEMENTS

It's happened to all of us: You've typed the wrong cursor character in a line within quotes and you've got to correct it. Here's an easy way to correct the line without retyping all of it.

List the line and move the cursor to the character after the error, press the delete key once and the insert key once. This will put you in Quote mode so that you can substitute the correct character. Type in the correct character to exit Quote mode, and press return to enter the changed line.

Try this a few times on a practice line containing a Print statement with several cursor characters inside quotes.

—L. M. LABAR, BETHLEHEM, PA

## 7. LANGUAGES—BASIC

### BASIC DIRECTORY

There will be times when you'll need to call up the disk directory while your program's running. Include this short subroutine in your programs, and you'll have instant access to the directory.

```
10 REM BASIC DIRECTORY - LUTHER W BRISKY
900 OPEN5,8,0,"$":GET#5,A$,A$
910 GET#5,A$,A$:IF A$="" THEN CLOSE5:GOTO960
920 GET#5,B$,L$
930 LN$=STR$(ASC(B$+CHR$(0))+ASC(L$+CHR$(0))
)*256):PRINTLN$ " ";
940 GET#5,A$:PRINTL$;A$;:IF A$="" THEN PRINT:G
OTO910
950 GOTO940
960 END:REM OR RETURN FOR SUB
```

—LUTHER W. BRISKY, VANCOUVER, WA

### SCROLL CONTROL TIP

Memory location 214 always contains the physical screen line number of the cursor (0 to 24), and, in programming, it is a useful location for controlling loop output to the screen. For example, when PEEK (214) is equal to a line number you've chosen, branch to a routine that waits for the user to press a key, then clear the screen and continue output. You can use 214 only on the C-64. In C-128 mode, use location 235, and on the Plus4, use location 205.

—JOSEPH R. CHARNETSKI, DALLAS, PA

### NUMBERS VS VARIABLES

Placing a number (such as .006347582) or a variable (N) equal to the number inside a For-Next loop can make an

amazing difference in a Basic program's execution time. Try the program below, and note the time, in jiffies, used by the program.

```
10 Z=TI:X=1:N=.006347582
20 FOR T=1TO1000
30 X=X+.006347582
40 NEXT:PRINT "X="X:PRINT TI-Z"JIFFIES."
```

Now change line 30:

```
30 X=X+N
```

and run the program, again noting the time in jiffies.

Although the only difference between the two programs is line 30 (using a number versus using a variable), the second version runs almost eight times faster. So, if you use a number more than a few times in a program, assign it to a variable instead.

—GARY ROBERTSHAW, ATASCADERO, CA

### BASIC-BLOCKS-FREE FINDER

If you need to know how much room is left on a disk while you're running a Basic program, just include this short subroutine. It should work with any Commodore computer. You'll have the answer along with the diskname almost instantly. Keep in mind that with double-sided disks formatted for the 1571 but being used in 1541 mode (or in a 1541 drive), the subroutine will show you only the blocks free on the single side.

```
10 REM BLOCKS FREE FINDER-J.R.CHARNETSKI
20 OPEN1,8,15,"10":OPEN8,8,0,"$0:"
30 FORJ=1TO18:GET#8,A$,B$:C$=C$+A$+B$
40 NEXT:CLOSE8
50 B=ASC(A$+CHR$(0))+256*ASC(B$+CHR$(0))
60 PRINT B;"BLOCKS FREE"
70 PRINT"ON DISK: ";MID$(C$,7,16)
80 PRINT#1,"UJ":FORZ=1TO1000:NEXT
90 CLOSE1:REM RETURN
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### USEFUL GOTO

Here's an easy way to put comments in your programs without wasting time or using extra space typing REM. Put your comments at the start of your program, beginning with line 2, and put the Goto command in line 1:

```
1 GOTO20
2 YOUR COMMENTS
3 ON LINES 2-19
```

If you use a renumber utility, you can include a Goto and the line number in your comments, along with a brief name for each subroutine. These will be renumbered, along with the program, but will not cause any problems when you run the program.

—CHANCE AGRELLA, PRESCOTT, AZ

### C-64 LIMITED INPUT SUBROUTINE

My routine lets you control the kind of data you want to enter into Input statements on the C-64. First, you control the prompt with a Print statement. The variable L is used to limit the length of the input. If L=5, for example, only five characters may be entered. ▶



# MAGIC

The variable T controls the type of character it will accept. If you set T equal to 0, it'll accept any printable character; if it equals 1, it'll accept only numbers; and if it equals 2, it'll accept only letters. The variable S\$ holds the string you input. Here are some examples:

```
PRINT "ANY STRING:";T=0:L=80:GOSUB10000 PRINT "UP  
TO 10 CHARACTERS:";T=0:L=10:GOSUB10000 PRINT "SOME  
NUMBERS=";T=1:L=80:GOSUB10000 PRINT "UP TO 8 LET-  
TERS?";T=2:L=8:GOSUB10000
```

Experiment with these examples in Direct mode. I'm sure you'll agree that this is a versatile routine.

```
9999 REM ULTIMATE INPUT ROUTINE-GEOFFREY K  
ERCHNER  
10000 POKE204,0:Z=0:S$="":PRINT" {CRSR LF}  
";:POKE198,0:IF L=0THEN L=255  
10010 GET A$:IFA$=""THEN 10010  
10020 IF L$="" THEN 10050  
10030 L=0:FOR J=1TOLEN(L$):IF A$=MID$(L$,J  
,1)THENL=1  
10040 NEXT:ON L+1 GOTO 10010,10100  
10050 IF A$=CHR$(13)THEN PRINT" ":POKE204,  
1:POKE 207,0:L=0:T=0:RETURN  
10060 IF A$=CHR$(20)ANDZ<>0THENZ=Z-1:S$=LE  
FT$(S$,Z):PRINT" {2 CRSR LFs} {CRSR  
LF}";:GOTO10010  
10070 A=ASC(A$):IFA<32OR(A<160 AND A>127)  
OR L=Z THEN10010  
10080 IF T=1 AND (A<48 OR A>57) THEN 10010  
10090 IF T=2 AND (A<65 OR A>90) AND A<>32  
THEN 10010  
10100 PRINTA$;:POKE212,0:PRINT" {CRSR LF}"  
;:Z=Z+1:S$=S$+A$:IFL$=""THEN10010  
10110 PRINT" ":POKE204,1:POKE207,0:L$="":L  
=0:RETURN
```

—GEOFFREY KERCHNER, OAK RIDGE, TN

## FASTER IF-THENS

If-Then statements containing the word AND execute more quickly if you replace each AND with THEN IF. This method works faster because program execution is automatically transferred to the next line if any single condition proves false. Try to put the condition most often false first to get the greatest gain in speed. Use this short program to compare the AND and THEN IF methods:

```
10 REM FASTER IF/THEN-GEORGE MONTELEONE  
20 REM LINES 20-40 SHOW OLD METHOD  
30 TI$="000000":FORI=1TO1000  
40 IF I=100 AND I/3*20=4 AND INT(I/256)+39  
=I THEN F=F+1  
50 NEXT:PRINT"TIME FOR OLD METHOD:"TI  
60 REM LINES 70-90 DO SAME AS ABOVE  
70 REM EACH 'AND' REPLACED BY 'THEN IF'  
80 TI$="000000":FORI=1TO1000  
90 IF I=100 THEN IF I/3*20=4 THEN IF INT(I  
/256)+39=I THEN F=F+1  
100 NEXT:PRINT"TIME FOR NEW METHOD:"TI
```

—GEORGE MONTELEONE,  
WINDSOR, ONTARIO, CANADA

## C-64 INPUT WITH SOUND

This Get routine disables the cursor keys and other non-printing keys. It also produces a soft beeping sound as each character is typed in.

```
90 REM INPUT WITH SOUND EFFECTS-JOSEPH R.  
CHARNETSKI  
100 R=54272:FORJ=RTOR+23:POKEJ,0:NEXT  
110 POKER+5,28:POKER+24,15:PRINT" {SHFT CLR  
}  
120 PRINT"[PROMPT HERE] ";  
130 PRINT" {CTRL 9} {CRSR LF} {CTRL 0}";  
140 GETA$:IFA$=""GOTO140  
150 IFAS=CHR$(13)THENPOKER+1,32:POKER+4,21  
:PRINT" ":POKER+4,20:GOTO220  
160 IFAS=CHR$(20)ANDLEN(C$)THENC$=LEFT$(C$  
,LEN(C$)-1):GOTO190  
170 IFAS=CHR$(32)ORAS>CHR$(127)ANDAS<CHR$(  
160)GOTO140  
180 C$=C$+A$  
190 POKER+1,28:POKER+4,17:PRINTA$;  
200 IFAS=CHR$(34)THENPOKE212,0  
210 POKER+4,16:GOTO130  
220 REM CONTINUE HERE...
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

## 8. LANGUAGES—ML

### BETTER THAN A BASIC LOADER

If you have some utilities in the form of Basic loaders (with Read and Poke statements and many Data lines), you can load, run and save them directly to memory with an ML monitor. Then you can load the programs directly with LOAD "program",8,1. Look at the C-64 Wedge program on your copy of the 1541 demo disk for an example. It loads your utilities much faster, since they don't have to be read and poked by Basic.

—ROLF STEIN, NAUCALPAN, EDO. MEXICO, MEXICO

### C-64 BSAVE COMMAND

I frequently need to save parts of memory on the C-64. I wrote the program below to add a BSave-type command to the C-64.

```
5 REM MEMORY SAVER-HAZEM JAUNI  
10 REM SYNTAX= !"NAME",START ADR,END AD  
R+1  
15 FOR N=51200TO51330:READQ:POKEN,Q:C=C  
+Q  
20 NEXT:IFC<>16574THENPRINT"ERROR!":END  
25 DATA 120,169,13,160,200,141,8,3,140,  
9,3,88,96,120,160,1,177,122,201,33  
30 DATA 208,77,32,115,0,32,115,0,201,34  
,208,67,160,1,177,122,240,61,201,34  
35 DATA 240,12,201,44,240,53,153,239,20  
0,200,192,17,208,236,152,56,101,122  
40 DATA 133,122,169,0,101,123,133,123,1  
36,152,162,240,160,200,32,189,255  
45 DATA 169,2,162,8,160,1,32,186,255,32
```



## MAGIC

```

,253,174,32,103,200,169,250,32,216
50 DATA 255,88,76,174,167,88,76,228,167
,32,138,173,32,247,183,32,253,174
55 DATA 165,20,133,250,165,21,133,251,3
2,138,173,32,247,183,166,20,164,21
60 SYS51200:NEW : DATA 96
    
```

If you want to use the routine to save memory to tape, add the following line to the listing.

23 POKE 51278,1

The syntax for the new command is !"filename",start address,end address + 1.

—HAZEM JAUNI, E. JERUSALEM, ISRAEL

## PROTECT YOUR ML

Commodore 128 programmers who use the Graphic1: Graphic5 commands to relocate the start of Basic to \$4000 to open up a large area in shared RAM (\$1300-\$3FFF) might place their programs in jeopardy!

Here's why: The Graphic5 command does not clear location \$D8 as Graphic0 does. \$D8 must be cleared to send text to the current screen, using the CHAR command rather than to the bit-mapped screen where your code is stored. If the byte is not cleared, CHAR will print the text over your ML code!

Therefore, always issue a Graphic0 command prior to Graphic5 or store a 0 in location \$D8 (216 decimal). The program you save may be your own!

—BOB KODADEK, ASTON, PA

## ML MEMORY TRANSFER

Transferring large blocks of memory on the C-64 sometimes seems to take an eternity. Machine language routines can transfer it quickly, but why reinvent the wheel? The answer is the Basic ROM routine at \$A3EC (41964). This built-in routine will move the character set (2K of memory) in less than a second.

You must provide a starting and ending address of the area to be copied and a new starting address to copy it to. These are entered in lines 50 and 80 of the program below. This program will demonstrate the transfer command by copying the character set (uppercase/graphics only) and customize it for an underlined cursor. The subroutine at line 120 calculates the addresses required and does the actual transfer.

```

10 REM MEMORY XFER
20 REM -XFER CHAR ROM-
30 POKE52,56:POKE55,0:POKE56,56:CLR
40 POKE56334,0:POKE1,51
50 SA=53248:EA=5296:NS=14336:GOSUB120
60 POKE1,55:POKE56334,1:POKE53272,30
70 REM -REV TO U.LINE-
80 SA=14336:EA=15359:NS=15360:GOSUB120
90 FORI=15367TO16390STEP8:POKEI,255:NEXT
100 END
110 REM -TRANSFER MEMORY SUB-
120 EA=EA+1:L=EA-SA:NE=L+NS
130 X=INT(L/256):Y=L-256*X
140 A=INT((NE-Y)/256):B=NE-256*A-Y
150 C=INT((EA-Y)/256):D=EA-256*C-Y
    
```

# INTRODUCING IMASTER-41



\$159

## 1541 COMPATIBLE DISK DRIVE

TO ORDER CALL TOLL FREE

1-800-544-6274

We guarantee your satisfaction!



**NORTH AMERICAN  
PRODUCTS  
INTERNATIONAL**

5892 MAIN STREET / SPRINGFIELD, OR 97478 / 503-741-1222

Circle 416 on Reader Service card.



## UTILITY MAX

Now have all these features on power-up with a plug-in cartridge.

- **PROGRAM BRACKET:** automatically loads, and displays or prints a sequential file from disk to your screen for easy one touch load and run. Simply great for lists!
- **NEW IMPROVED FAST LOADER:** use load menu programs up to BASIC's faster
- **DIRACT DIRECTORY:** displays the disk contents to your screen or printer
- **BRIDGE DIR FILE:** displays all disk files to the screen for easy viewing
- **BRIDGE DIR FILE:** displays all disk files to the screen for easy viewing
- **RECOVER A FILE:** retrieves the recovery of 0 file that was previously erased
- **BRIDGE WHOLE DISK:** easily and quickly erase the contents of a whole disk
- **FORMAT YOUR DISK:** formats your disk with compatible disk error checking
- **VALIDATE A DISK:** allocates the unused blocks on your disk for reuse
- **INITIALIZE DRIVE:** rears disk drive to track #1, resets the error channel
- **CHANGE DISK NAME:** enter a new (16) character name for your disk
- **CHANGE DIR LD:** easily enter a new (2) character disk ID for your disk
- **DIR FILE READER:** read and display or print a sequential file from disk
- **COLOR ADJUSTMENT:** graphic color box display for easy color adjustment
- **BIT PRINTER CODE:** set up the printer before using your word processor
- **PROGRAM LOAD ADDRESS:** easily find the load address of any disk program
- **LABEL DEVELOPER:** create, print, save and recall up to (144) labels per disk
- **CHANGE DIR:** temporarily change your drive from device # to device #
- **FIND BLOCKS FREE:** easily find the number of blocks free on any disk
- **DIR SORT LOCATE:** easily sort or unlock your disks with a touch of a key
- **CLEAN DISK DRIVE:** quickly spin the disk drive motor for easy head clearing
- **DIR REMOVAL TEST:** selectively checks the disk sector for proper operation
- **JOYTRICE CHECKER:** verifies operation of joystick and the joystick ports
- **TYPEWRITER MODE:** simulates a typewriter for short notes and messages
- **RESET SWITCH:** conveniently reset your computer without turning it off

To order from within the USA, send a check or money order for \$54.95 and \$3.50 shipping. Orders outside the USA send \$54.95 and \$10.00 shipping. Owners of Magic Menu cartridges can deduct \$20.00 from the total cost, and must send the Magic Menu cartridge with their check or money order.

Make checks or money orders payable to:  
Computer Camp, Inc.  
1202 Sioux Street  
Jupiter, Florida 33458





```
16Ø POKE781,X+1:POKE782,Y
17Ø POKE88,B+1:POKE89,A
18Ø POKE9Ø,D+1:POKE91,C
19Ø SYS41964:RETURN
```

—ROBERT B. COOK, BRAINTREE, MA

## 9. GEOS

### FLIPPING FASTER THROUGH GEOS DISK DIRECTORIES

One undocumented feature of GEOS lets you view the pages of a disk directory in Icon mode without the joystick. Just press the control key and the number key corresponding to the page number you wish to see.

—HENRY H. TOLBERT, MARIETTA, GA

### GEOS AND THE RESTORE KEY

When you exit from GEOS to Basic, the restore key is redefined to reboot GEOS. You can eliminate this function either by typing POKE 792,71 and pressing return or by turning the computer off and on again.

—R. V. TAYLOR, LITTLE ROCK, AR

### A STAR WITH GEOS

Use your Star SG-10 printer with GEOS by setting the DIP switches to the ON position.

—MARK L. ELLIS, GERMANTOWN, TN

### GEOS FILE DANGER

Leaving a GEOS, GEOS Boot or GEOS Kernal file on the Desktop will prevent your C-64 from loading files properly, and it can also keep the master disk from booting. You can avoid this problem by never leaving a file on the Desktop when you close the master disk.

—ROBERT M. ROBY, WHITEMAN AFB, MO

### EXTRA GEOS CHARACTERS

Although they're not mentioned in the manual, several additional characters are available in GEOS by using the Commodore key with the following keys:

```
[ makes a { (curly left bracket)
] makes a } (curly right bracket)
/ makes a \ (backslash)
@ makes an è (accent mark)
* makes a ~ (tilde mark)
| makes a | (vertical bar)
```

—BARRY SOLOMON, MONTGOMERY, PA

### GEOS FONT STYLES

If you're having trouble changing GEOS font styles (such as italic to bold), try this trick. Activate the style menu, highlight the Plain Text style and click once. Then repeat the process, but this time highlight the desired style. When you start typing, the new style will be displayed. If you change from italic to bold without plain text between, you'll get bold italic.

—WILLIAM LEES, SAN FRANCISCO, CA

## 10. PROGRAMMING TIPS—GENERAL

### MYSTERIOUS ERRORS REVEALED

For all of you who've ever gotten an error in a "perfectly good" line containing a Read statement (and who hasn't?), here's some magic for you. These errors usually result from poking a value greater than 255 (an Illegal Quantity error) or typing the letter O for a 0 in a data line (a Type Mismatch error). To ferret out the culprit, type in the appropriate line below:

```
For the C-64, Plus/4 and C-16: PRINT PEEK(63)+PEEK(64)*256
For the C-128: PRINT PEEK(65)+PEEK(66)*256
```

Now list the line number printed on the screen; you'll find the error in that line.

—JIM BORDEN, CARLISLE, PA

### CHEAT SHEETS

Many programs have important key commands on the keyboard that perform special functions. A good way to remember these keys is to list them on an index card. This simple trick saves me both time and effort, and I can now spend time at the keyboard that would otherwise be taken up in fiddling through my manuals for the information.

—ADAM JACKSON,  
SAULT STE. MARIE, ONTARIO, CANADA

### CAPS-LOCK-Q FIX

Some of you have already discovered that you cannot get an uppercase Q with the caps lock key on the C-128. You can fix the bug by entering my one-line program.

```
1Ø REM CAPS-LOCK-Q FIX - JERRY KIRK
2Ø FAST:BANK15:FORJ=ØTO88:POKE6333+J,PEEK(64484+J):NEXT:POKE84Ø,189:POKE841,24:POKE6395,2Ø9:SLOW
```

—JERRY KIRK, HEISKELL, TN

### DEVICE PRESENT CHECK

The following short program works with any Commodore computer and will detect if the disk drive and/or printer is on. You can modify it to wait until the device is turned on to avoid incurring a Device Not Present error in your program.

```
1Ø REM DEVICE CHECK-STEPHEN FREITAG
2Ø OPEN15,8,15:CLOSE15:REM DRIVE
3Ø IF ST=Ø THEN PRINT"DRIVE IS ON":GOTO5Ø
4Ø PRINT"DRIVE IS OFF"
5Ø OPEN15,4,15:CLOSE15:REM PRINTER
6Ø IF ST=Ø THEN PRINT"PRINTER IS ON":END
7Ø PRINT"PRINTER IS OFF"
```

—STEPHEN FREITAG, SAUQUOIT, NY

### BLOCKS REQUIRED

If you regularly fill up the space on your disks, then enter the line below for your computer. It will tell you how many blocks are required to save a program.

For the C-64 use:



## MAGIC

```
X = PEEK(45) + 256 * PEEK(46) - 2049:PRINT INT(X/254) + 1:"DISK  
BLOCKS REQ'D"
```

For the C-128 use:

```
GRAPHIC CLR:X = 58109 - FRE(0):PRINT INT(X/254) + 1:"DISK  
BLOCKS REQ'D"
```

For the C-64, X calculates the end of your Basic program and subtracts the starting address (2049) from it. The C-128 version is easier to calculate, since all of Bank 0 except 7427 bytes are available for program storage.

—JEFF ROSS, NEWARK, DE

### IS THIS YOUR EXIT?

When I add a menu to a program I'm working on, I include a Quit option. I also put in Print statements to remind me of lines I'll need to change, the values of variables, and so on. When I'm finished with the program, I remove any statements I used while I was debugging. By putting this option's code at the end of the listing, deleting such lines will not disturb the order of line numbers in the main program.

—BOB DAY, MONROVIA, CA

### SIMPLE NO-PROMPT INPUT

Once in a while, the question mark prompt gets in the way when I'm using the Input statement. My two-liner puts an end to this pest:

```
10 PRINT "PLEASE ENTER YOUR NAME":PRINT "?";  
20 OPEN1,0:INPUT#1,N$:CLOSE1:PRINT
```

The Print statement at the end of line 10 prints a prompt, but you may drop the line if you wish. The Print statement in line 20 moves the cursor to the next line when you're done with the Input statement.

—DAVE BIUNNO, JACKSON HEIGHTS, NY

### NO-SCROLL KEY DISABLE

You can disable the no-scroll key on the C-128 by entering POKE 247,PEEK(247)OR64.

—DAIHUNG DO, EAST MOLINE, IL

### C-128 ESCAPE ESC

I've found an undocumented escape function in the C-128's screen editor. Just press the escape key twice. The double escape disables Reverse, Underline, Insert (from the insert-delete key) and Quote modes. This result is the same as pressing ESC O, but it's easier to type.

—CHARLES LAVIN, CORAL GABLES, FL

### CUSTOMIZER PROGRAM

Here's a program I use to customize my C-128 in either C-128 or C-64 mode automatically. It will also load a menu program for you, remind you what computer you're using when you're in 40-Column mode and display the function keys at the bottom of the 128 screen. (You should change these to match your own definitions.) If you use a C-64 only, eliminate the If statement at the end of line 40. You need not enter lines 90-140.

```
10 REM C-64/128 CUSTOMIZER-BOB KNIBB  
20 M$="DO YOU WISH TO SEE A MENU (Y/N) (CTR  
RL O)?"  
30 POKE53280,0:POKE53281,0:PRINTCHR$(142)"  
{2 HOMES}{SHFT CLR}";  
40 FORS=55333TO55335:POKES,1:NEXT:IF FRE(0  
)<>FRE(1)THEN90  
50 POKE646,7:POKE1062,54:POKE1063,52:PRINT  
"{CRSR DN}"M$;  
60 GETA$:IFA$=""THEN60  
70 PRINT"(CRSR LF)"A$:IFA$="N"THEN NEW  
80 POKE46,PEEK(44)+8:CLR:LOAD"MENU64",8  
90 KEY1,"DATA ":KEY4,"PRINT":KEY8,"RENUMBE  
R"+CHR$(13):COLOR5,15:POKE235,22  
100 IFPEEK(215)THENFAST:COLOR6,1:PRINT:L=4  
:GOSUB130:WINDOW0,0,79,23:GOTO120  
110 POKE1061,49:POKE1062,50:POKE1063,56:GO  
SUB130:GOSUB130:WINDOW0,1,39,22  
120 COLOR4,8:PRINTM$:GETKEY$:PRINT"{SHFT  
CLR}":IFA$="Y"THENRUN"MENU128":ELSE NE  
W  
130 PRINT:FORI=1TOL+4:READF$,K$:PRINT"{CTR  
L 9}"F$"{CTRL 0}"K$"{2 SPACES}";:NEXT  
:RETURN  
140 DATA F1,DATA,F2,LOAD,F3,DIREC,F4,PRINT  
,F5,SAVE,F6,RUN ,F7,LIST ,F8,RENUM
```

—BOB KNIBB, WALKERSVILLE, MD

### LONG C-64 LINES

The Basic On-Gosub command is quite helpful, but sometimes you need to use it in a line with more line numbers than will fit on an 80-character line. To get around this, just split the line numbers into two lines. Here's an example:

```
100 ON A GOSUB 1100,1200,1300,1400,1500,1600,1700,  
1800,1900,2000,2100,2200,2300,2400,2500
```

This line is too long, so we'll break it into two lines as follows:

```
100 IF A>8THEN110  
103 ON A GOSUB 1100,1200,1300,1400,1500,1600,1700,1800  
106 GOTO 120  
110 ON A - 8 GOSUB 1900,2000,2100,2200,2300,2400,2500  
120 . . . program continues here . . .
```

By breaking up the long line, you can still use the On-Gosub command with almost any number of target lines.

—STEPHEN TANG, ADDRESS UNKNOWN

## 11. PROGRAMMING TIPS—MATH/EDUCATION

### BASE CONVERSIONS

Did you ever wish there was an easy way to convert a number from one number base to another? The C-128's Monitor mode makes conversion easy! Just type MONITOR and press return (or use the F8 key) to put you into the built-in monitor. To change a number from one base to another, type +, \$, & or % and the number. You'll be given the decimal (+), hexadecimal (\$), octal (&) and binary (%) equivalents. Just precede the number with the appropriate symbol, and you can convert from any base to the others. To return ▶



# MAGIC

to Basic, type X and press return.

—KENNETH H. HOTTES, DANBURY, CT

## DECIMAL-TO-BINARY CONVERTER

My one-line program converts decimal numbers 0-255 to their binary equivalents.

```
1 REM DEC TO BIN-JAMES R SCHWARTZ
10 INPUT D:FORI=7TO0STEP-1:B=B$+MID$(STR$(
  SGN(D AND 2{UP ARROW}I)),2):NEXT:B=VAL(B
  $):PRINTB
```

—JAMES R. SCHWARTZ, MICHIGAN CITY, IN

## HEX-TO-DECIMAL CONVERTER

My program converts hex numbers to decimal form. It can convert numbers up to \$3B9AC9FF (999,999,999 in decimal). The program works on any Commodore computer.

```
10 REM LARGE HEX CONVERSION (ALL)-ROGER MO
  ORE
20 INPUT"NUMBER IN HEX";H$:L=LEN(H$):S=0
30 FORI=LTO1STEP-1:A=ASC(MID$(H$,I,1))
40 IFA>64ANDA<71 THEN S=S+(A-55)*16{UP ARR
  OW}(L-I):GOTO70
50 IFA<48ORA>57 THEN80
60 S=S+(A-48)*16{UP ARROW}(L-I)
70 NEXT:PRINT"DECIMAL EQUIVALENT IS:"S:GOT
  O20
80 PRINT"THAT IS NOT A VALID HEX NUMBER!"
```

—ROGER MOORE, OAK RIDGE, TN

## NUMBER TUTOR

This simple program for the C-128 amazes children and helps them to think of a number in relation to another.

```
0 REM NUMBER TUTOR - MARY HUBBARD
10 COLOR0,7:COLOR4,5:PRINT"{SHFT CLR}{3 CRS
  R DNs}THINK OF A NUMBER BETWEEN 1 AND 10
  0"
20 PRINT"AND {SHFT I} WILL GUESS YOUR NUMBE
  R!":H=100:L=1:T=0
30 DO:M=INT((H-L)/2)+L:T=T+1
40 PRINT"{3 CRSR DNs}IS IT"M"?":CHR$(7):PRIN
  T"{2 CRSR DN=}MY GUESS IS (H)IGH, (L)OW
  OR (R)IGHT?"
50 GETKEY S$:IFS$="H"THENH=M:ELSE IF S$="L"
  THEN L=M:ELSE IF S$="R"THEN EXIT:ELSE GO
  TO50
60 LOOP
70 SCNCLR:TEMPO15:PLAY"V106T9U15X005QCGO6IC
  CCO5IGGGQECECCO6ICCCO5IGGGEEEQGEC"
80 PRINT"I GUESS IT IN ONLY"T"TRIES!":PRINT
  "WANT TO TRY AGAIN?":PRINT"(Y)ES OR (N)O
  "
90 GETKEYS$:IFS$="Y"GOTO10:ELSE END
```

—MARY JO HUBBARD, CARPENTERSVILLE, IL

## WORD MIXER

Here's a short program that scrambles the letters in words and prints them out to use in a word game. Load and run the program and input up to 20 words from a selected topic.

The scrambled words will be printed on one sheet of paper and the answers on the next sheet. The program should work with any computer/prINTER combination. The CHR\$(95) in line 40 is for non-Commodore printers, but it won't affect Commodore printers.

```
0 PRINT"{SHFT CLR}{4 CRSR DNs}{7 SPACES}*
  WORD MIXER BY T J RYAN *"
10 INPUT "{4 CRSR DNs}{5 SPACES}TOPIC";T$
20 INPUT "{CRSR DN} # OF WORDS";N:IFN>20TH
  ENPRINT"20 WORDS MAX!":GOTO20
30 DIM B(30),J$(N),L$(30),W$(N)
40 FOR J=1TO20:B=B$+CHR$(95):NEXT
50 FORW=1TON:PRINT"{CRSR DN} WORD #";W;:IN
  PUT W$
60 L=LEN(W$):W$(W)=W$:FORK=1TOL:L$(K)=MID$(
  W$,K,1):B(K)=K:NEXT
70 FORK=1TOL:D=INT(RND(1)*L+1):E=INT(RND(1)
  *L+1):T=B(D):B(D)=B(E):B(E)=T:NEXT
80 FORK=1TOL:J$(W)=J$(W)+L$(B(K)):NEXT:NEX
  T
90 OPEN4,4:CMD4:REM SEND WORDS TO PRINTER
100 PRINT SPC((80-LEN(T$))/2);T$:PRINT
110 PRINT:PRINT:FORJ=1TON:PRINTSPC(30-LEN(
  J$(J)));J$(J);" {2 SPACES}";B$:PRINT:NE
  XT
120 FORJ=1TO61-2*N:PRINT:NEXT:FORJ=1TON:PR
  INT W$(J):NEXT
130 PRINT#4:CLOSE4
```

—T. J. RYAN, NORWOOD, OH

## FASTER FRACTION ACTION

The program below converts terminating decimals into common fractions in lowest terms quickly. It takes advantage of the fact that terminating decimal fractions can be reduced only by dividing by powers of 2 and 5. This saves the time of fruitless division by other integers. The program should work on all Commodore computers.

```
10 REM FAST COMMON FRACTIONS-B.R.HICKERSON
20 INPUT"GIVE ME A DEC. NO. ";N$
30 FORX=1TOLEN(N$)
40 IFMID$(N$,X,1)=". "THENFLAG=1:D=X
50 NEXT:IFVAL(N$)=0THEN END
60 IF FLAG<>1THENPRINT N$:GOTO20
70 L$=LEFT$(N$,D-1):R$=RIGHT$(N$,LEN(N$)-D
  )
80 T$="1":FORY=1TOLEN(R$):T$=T$+"0":NEXT
90 PRINT L$" "R$/"T$" IN LOWEST TERMS IS:
  "
100 R=VAL(R$):T=VAL(T$)
110 IFR/2=INT(R/2)ANDT/2=INT(T/2)THENR=R/2
  :T=T/2:GOTO110
120 IFR/5=INT(R/5)ANDT/5=INT(T/5)THENR=R/5
  :T=T/5:GOTO120
130 IFT/R=INT(T/R)THENT=T/R:R=R/R
140 R$=STR$(R):T$=STR$(T):R$=RIGHT$(R$,LEN
  (R$)-1):T$=RIGHT$(T$,LEN(T$)-1)
150 PRINTL$" "R$/"T$:RUN
```

—BRYCE R. HICKERSON, CARMICHAEL, CA



## MAGIC

### SPELLING PRACTICE

Students of all ages will enjoy this program as they improve their typing, spelling and word-recognition skills. It should run on any Commodore computer.

A word from the word list is displayed on the screen in turn, then wiped out, and the student types in the correct spelling. The program displays any misspelled word to give the student a second chance before advancing to the next word.

To change the word list, enter your new words in the Data statement in line 200 of the listing. Add extra Data statements to accommodate additional words. Be sure to scratch the old listing and save the new version.

```

10 REM SPELLING PRACTICE-JOE CHARNETSKI
20 INPUT"(SHFT CLR)DISPLAY SPEED 1-12";S
30 READW$:R=1
40 PRINT"(SHFT CLR) (CRSR DN) (CRSR DN) (
  CTRL 9) "W$
50 IFW$="END"GOTO150
60 X=1:FORZ=1TO1400-50*S:NEXT
70 FORZ=1TO10:GET A$:NEXT
80 T=T+1:INPUT"(SHFT CLR){2 CRSR DN}THE W
  ORD IS";A$:PRINT
90 IFA$=W$THENW$="<<OKAY>>":C=C+1:R=0
100 PRINTTAB(13)W$"{CRSR UP}"
110 FORZ=1TO150:NEXT:X=X+1:IFXAND1GOTO100
120 IFX<12THENPRINT"(CTRL 9)";:GOTO100
130 IFRTHENR=0:GOTO40
140 GOTO30
150 PRINT"{CRSR DN}RIGHT=";C
160 PRINT"{CRSR DN}WRONG="T-C
170 INPUT"{CRSR DN}WANT TO PRACTICE MORE (
  Y/N)";K$
180 IFK$="Y"THENRUN
190 PRINT"{CRSR DN}BYE..."
200 DATA ACCOMMODATE,WEIRD,SUPERSEDE,PSYCH
  OLOGY
999 DATA END

```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### PRIME NUMBERS

This short and relatively fast program determines if a number is prime. Numbers up to 10,000 will take only a few seconds; larger numbers will take up to a minute (9,999,973 takes about 40 seconds on a C-64). The program should work on any Commodore computer.

```

10 REM PRIME BRIAN DUCHESNEAU
20 PRINT"(SHFT CLR)"
30 INPUT"(CRSR DN)";X:Z=SQR(X):Y=1:IFX=0TH
  EN END
40 IF X/2=INT(X/2)THENPRINT"{CRSR DN}COMPO
  SITE":GOTO30
50 FORY=3TOZSTEP2:D=X/Y:I=INT(D):S=D-I
60 IF S>0THEN NEXT
70 IF S=0THENPRINT"{CRSR DN} COMPOSITE":GO
  TO30
80 PRINT"{CRSR DN} PRIME":GOTO30

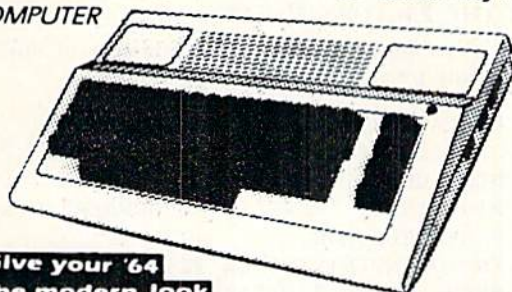
```

—BRIAN DUCHESNEAU, ST. ALBANS, VT ▶

# Slimline'64Case

A NEW IMAGE FOR  
THAT FAVOURITE  
COMPUTER

- Easy to Fit
- Lower key height



Give your '64  
the modern look

Now you can have that sleek new look without buying a new computer. Our replacement case will give your '64 the modern look and color you have been wanting. Installation takes just 10 minutes and requires only a Phillips screwdriver. So don't be stuck with the old look when the Slimline is here and ready for immediate shipping.

Our price of \$34.95 includes handling charges. Certified checks or postal money orders will be shipped on receipt. Personal checks must be held for 4 weeks pending bank clearance. Sorry, no COD's. Charge cards can order by calling (902) 892-6372.

**GDP**  
Grapevine Data Products

PO BOX 1886  
Charlottetown PEI  
Canada C1A 7N5

Circle 419 on Reader Service card.



V4.0

ULTRABYTE  
DISK  
NIBBLER

POWERFUL NEW GCR NIBBLER  
FOR COMMODORE 64 and 128 (in 64 mode)

- Automatically copies most disks in 2 minutes or less including variable density and rapid locked protection
- 105 new parameters to make unprotected copies of recent disks. Send stamped envelope for list
- Copies up to 40 tracks using 1 or 2 1541 or 1571 drives. Copies both sides on 1571
- Copies itself (for this reason, no refunds given)

SPECIAL — BUY A NIBBLER V4.0 AND GET  
YOUR CHOICE OF A FREE \$14.95 PROGRAM  
\$39.95 plus \$4.00 shipping

1. Disk Surgeon V2.0 -- new disk utility ..... \$14.95
  2. Ultramail -- mail list and labels..... } both for  
Handy-Capper -- race handicapper ..... } \$14.95
  3. McMurphy's Mansion -- text adventure ... } both for  
Soluware -- solutions to 10 adventures ... } \$14.95
- ( Above may be ordered separately for \$14.95 plus \$4.00 shipping. Foreign orders add \$2.00 )

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 - Return original Ultrabyte disk with \$15.00 plus \$4.00 shipping. Foreign add \$2.00. No free disk with update

To order, write or call 24 hr. order line. For info. write.

ULTRABYTE (818) 796-0576

P.O. Box 789 LaCanada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED



### JUST THE FACTORS, PLEASE

This short program will find the factors of any whole number and print them on the screen.

```

1Ø REM FACTOR FINDER-DARYL BRANSON
2Ø POKE5328Ø,Ø:POKE53281,12
3Ø PRINT CHR$(14)
4Ø PRINT:INPUT "WHAT'S THE NUMBER";N:N1=N
5Ø IF N=ØTHEN END
6Ø IFN<1ORINT(N)<>NTHEN PRINT"ONLY WHOLE N
  UMBERS ABOVE Ø PLEASE!":GOTO4Ø
7Ø FORFP=2TON
8Ø IF N/FP=INT(N/FP) THEN PRINTFP"*";Z=1:
  N=N/FP:GOTO7Ø
9Ø NEXT:PRINT"{CRSR LF}="N1:GOTO4Ø
  
```

—DARYL BRANSON, BRANSON, MO

### FINDING YOUR ROOTS

Everyone knows how to find a square root on his Commodore, but how do you find other roots? The answer is in the power, or up-arrow, function. Just raise the number to the reciprocal of the root you want. For example, to find the cube root of 1860867, enter PRINT 1860867<sup>1/3</sup> to get the answer of 123. Be sure to use parentheses for the reciprocal part of the calculation.

—LANCE SLOAN, SWARTZ CREEK, MI

## 12. PROGRAMMING TIPS—SCREEN DISPLAY

### BYTE-SIZE SPRITE ANIMATION

In conventional sprite animation, several sprites, each showing a different stage of the given motion, are successively flashed on the screen. But you can also produce sprite animation with the Poke command to change individual bytes in the memory map of a given sprite. This will produce corresponding changes in the sprite as seen on the screen. The following routine shows one general approach:

```

1Ø REM BYTE-SIZE SPRITES-MARK AKSOY
2Ø FORI=1TO64:POKE16255+I,Ø:NEXT:REM CLEAR
  SPRITE
3Ø POKE 53248,2ØØ:POKE53249,2ØØ:POKE53287,7
  :POKE53281,Ø
4Ø POKE2Ø4Ø,254:POKE53271,1:POKE 53277,1:PO
  KE53269,1
5Ø FOR J=1TO2ØØ:RB=INT(RND(1)*64)+16256
6Ø POKERB,1Ø2:FORD=1TO15:NEXT D:POKE RB,Ø:N
  EXT
  
```

Line 20 pokes 64 zeros into the sprite map beginning at location 16256. Lines 30 and 40 set the sprite parameters for the "empty" sprite. You can flash on any pattern of bytes in this sprite. In this case, line 60 pokes 102 and then 0 into an address randomly chosen in line 50 and is repeated 200 times within loop J. You can use this pattern of blinking yellow bars as the exhaust of a rocket sprite or as an underwater shimmer effect if shown over a predrawn fish sprite. You can modify the above routine to yield numerous animated patterns with widespread applications, from simulating fire to enhancing the illusion of movement by other sprite objects. And it's all done byte by byte!

—MARK AKSOY, GLENOLDEN, PA

### SIDEWINDER

My one-liner scrolls a message (A\$) across the top of the screen, showing only 36 characters at a time. Add a few blank spaces at the beginning of A\$ to more easily read the message.

```

Ø REM SCREEN SCROLL-MIKE FRANSEN
1 A$="{23 SPACES}LINE 1Ø IS A ONE LINER THA
  T WILL PRINT A$ AT THE "
2 A$=A$+"TOP OF THE SCREEN AND SCROLL THE M
  ESSAGE AS YOU READ IT.{2 SPACES}THE 5Ø CA
  N "
3 A$=A$+"BE CHANGED TO ALLOW A FASTER OR SL
  OWER DELAY.{2 SPACES}CURSOR DOWNS CAN BE
  "
4 A$=A$+"ADDED AFTER THE HOME TO MOVE THE M
  ESSAGE DOWN."
9 :
1Ø FORA=1TOLEN(A$):PRINT"{HOME}":FORI=1TO5Ø
  :NEXTI:PRINT"{2 SPACES}"MID$(A$,A,36)" "
  :NEXTA
  
```

—MIKE FRANSEN, MISSOULA, MT

### BI-DIRECTIONAL SCREEN PRINTER

My bi-directional printing program adds a special touch of magic to your screen titles. You can also use this technique to enhance game scenarios, help messages, even menus.

You can vary the printing speeds by increasing or decreasing the time delay loops in lines 120 and 150, respectively. This program should work on any Commodore computer with a 40-column monitor. If you use 80 columns, change 40 to 80 in line 180.

```

1Ø REM SCREEN TITLES - SUSAN CHARNETSKI
2Ø RVS=1:PRINT"{SHFT CLR}{8 CRSR DNS}"
3Ø A$="*{3 SPACES}* ***** * *****":G
  OSUB1ØØ
4Ø A$="** ** *{3 SPACES}* *{5 SPACES}* *{4
  SPACES}":GOSUB13Ø
5Ø A$="* * * ***** *{2 SPACES}** * *{4 SPA
  CES}":GOSUB1ØØ
6Ø A$="*{3 SPACES}* *{3 SPACES}* *{3 SPACE
  S}* * *{4 SPACES}":GOSUB13Ø
7Ø A$="*{3 SPACES}* *{3 SPACES}* ***** * *
  *****":GOSUB1ØØ
8Ø A$=" BY SUSAN CHARNETSKI "
9Ø RVS=Ø:PRINT:GOSUB13Ø:END
1ØØ GOSUB18Ø:GOSUB16Ø:FORLR=1TON
11Ø PRINTTAB(LR+X)MID$(A$,LR,1);
12Ø FORTD=1TO3Ø:NEXT:NEXT:PRINT:RETURN
13Ø GOSUB18Ø:FORRL=NT01STEP-1:GOSUB16Ø
14Ø PRINTTAB(RL+X)MID$(A$,RL,1);"{CRSR UP}
  "
15Ø FORTD=1TO25:NEXT:NEXT:PRINT:RETURN
16Ø IFRVS=1THENPRINT"{CTRL 9}";
17Ø RETURN
18Ø N=LEN(A$):X=(4Ø-N)/2-1:RETURN
  
```

—SUSAN M. CHARNETSKI, PLAINS, PA

### PERMANENT SCREEN MAPPER

I'd like to share an improvement I made to the C-64 Screen Mapper trick on page 38. I glue a screen map produced by the Screen Mapper program to a stiff sheet of cardboard and cover it with a clear plastic cover. I use a grease pencil



# MAGIC

for drawing, and wipe off the plastic with a damp cloth when I'm finished.

—DALE PIZZO, ROXBOROUGH, PA

## C-128 RADAR LOCATOR

While I was using the Draw command, I got unexpected results, and upon checking my program, I found that I had used a syntax that allows a line to be drawn out a certain distance from the center at a given angle. After further experimentation, I found that the Locate command allows the same syntax. This short program shows how this use of Draw and Locate works:

```

Ø REM C-128 RADAR-ANDRES KICELEFF
1Ø COLORØ,1:COLOR1,2:GRAPHIC1,1:CIRCLE1,16
  Ø,1ØØ,83,83:CIRCLE1,16Ø,1ØØ,4Ø,4Ø
2Ø L=35:DI=Ø:VE=5:LOCATE16Ø,1ØØ
3Ø DRAW1,16Ø,1ØØTOL;DI:LOCATE1Ø;DI:DRAW1,R
  DOT(Ø),RDOT(1)TOL;DI:LOCATE16Ø,1ØØ:DRAW
  Ø,16Ø,1ØØTOL;DI:LOCATE1Ø;DI:DRAWØ,RDOT(
  Ø),RDOT(1)TOL;DI:DI=DI+VE
4Ø IFDI>36ØTHENDI=DI-36Ø:GOTO3Ø:ELSEGOTO3Ø

```

—ANDRES KICELEFF, BUENOS AIRES, ARGENTINA

## 80-COLUMN REGISTER TABLE

With this program, you can examine each of the 37 registers of the C-128's 8563 chip. It also shows how to use the RREG command to pass the computer's registers back to the Basic program. (See "C-128 SYS in Reverse" on page 67 for more about the RREG command.)

If you have a copy of the *Commodore 128 Programmer's Reference Guide*, you can use the printout to better understand the 8563 chip by comparing the printout to the register map on page 294.

The program should work with any printer. If you don't have a printer, change the OPEN4,4 in line 4 to OPEN4,3 to display the chart on the screen.

```

Ø REM 8563 REG.TABLE-TOM SMITH
2 PRINT"{SHT CLR}{3 CRSR DNS}{2 SPACES}BE
  SURE PRINTER IS ON...":PRINT"PRESS ANY
  KEY TO START..."
4 GETKEYA$:OPEN4,4:GOSUB18:PRINT#4,"! * *
  * * 8563 8Ø-COL CHIP REGISTERS * * * * !
6 GOSUB18:PRINT#4,"!{12 SPACES}!{7 SPACES}
  BINARY BIT TABLE{8 SPACES}!"
8 PRINT#4,"! REG#{2 SPACES}DEC# ! 7 ! 6 !
  5 ! 4 ! 3 ! 2 ! 1 ! Ø !":GOSUB18
1Ø FORZ=ØTO36:SYS52698,,Z:RREG A:PRINT#4,"
  ! "N;SPC(4-LEN(STR$(N)))A;
12 PRINT#4,SPC(5-LEN(STR$(A)))"!";
14 FORL=7TOØSTEP-1:PRINT#4,-((AAND2{UP ARR
  OW}L)=2{UP ARROW}L)"!";:NEXT:PRINT#4:N=
  N+1:NEXT
16 GOSUB18:PRINT#4:CLOSE4:END
18 FORL=1TO23:PRINT#4,"--";:NEXT:PRINT#4:R
  ETURN

```

—THOMAS B. SMITH, GALLIPOLIS, OH

## C-64 CURSOR LOCATOR

This is my method of placing the cursor where I want it on my 64 screen. It's less trouble to use than some other routines I've tried, and it requires only 36 bytes of memory. I usually place the routine beginning at location 679, but you may relocate it to any available 36 bytes. Put this short routine in your programs:

```

Ø REM 64 PRINT @-HARRY SIMMS
1Ø SA=679:FORJ=SATOSA+35:READ B:C=C+B:POKE
  J,B:NEXT
15 IFC<>4639 THEN PRINT"DATA ERROR!!"
2Ø DATA 32,253,174,32,158,183,138,56,2Ø1,4
  Ø,144,5,162,14,76,139,227,72
3Ø DATA 32,253,174,32,158,183,138,56,2Ø1,2
  5,176,238,1Ø4,168,24,76,24Ø,255

```

After this section is run in your program, just use SYS SA,C,R to move the cursor. The value of SA is the beginning of the ML code. The column is passed next as C (0 to 39) and the row is passed last as R (0 to 24). You may use any number or variable in place of C or R as long as they are within the legal range.

—HARRY SIMMS, TEXARKANA, TX

## C-128 JUMBO HI-RES TEXT

This short subroutine takes advantage of the C-128's powerful graphics commands to create double-size characters on the hi-res, 40-column screen. Three variables are used in the subroutine:

- T\$ for the text to be printed
- XT for the horizontal (X) position
- YT for the vertical (Y) position

Here's the subroutine with an example:

```

1Ø REM JUMBO HI-RES TEXT-JASON S. MACDONAL
  D
2Ø GRAPHIC2,1,2Ø:REM-EXAMPLES-:
3Ø XT=25:YT=35:T$="MAGIC IS":GOSUB1ØØØ
4Ø XT=55:YT=6Ø:T$="GREAT FUN!":GOSUB1ØØØ:
  END
1ØØØ CHAR1,Ø,24,T$:FORA=1TOLEN(T$)*8:SSHAP
  E A$,A-1,192,A-1,2ØØ:GSHAPEA$,XT+X1-1
  ,YT:GSHAPE A$,XT+X1,YT:X1=X1+2:NEXT:X
  1=Ø
1Ø1Ø CHAR1,Ø,24,"{4Ø SPACES}":RETURN

```

For an added twist, add YT = YT + .5: before the NEXT in line 1000.

—JASON S. MACDONALD, MENA, AR

## LO-RES DRAW PROGRAM

My program lets you make simple drawings on the C-64's 40-column screen, and it's easy enough for a child to use. Use a joystick in port 2 to control the cursor. The fire-button or any key except home changes colors. Change the color to black to erase the drawing. Use the home key to clear the screen and start a new picture.

```

1Ø REM LO-RES DRAW - ADAM MILLER
2Ø POKE53281,Ø:POKE5328Ø,Ø:C=1:X=Ø:Y=Ø:PRI
  NT"{SHT CLR}"
3Ø J=PEEK(5632Ø):F=JAND16:J=15-(JAND15):IF ▶

```



## MAGIC

```
J=1ORJ=5ORJ=9THENY=Y-1
4Ø IFJ=2ORJ=6ORJ=1ØTHENY=Y+1
5Ø IFJ=4ORJ=5ORJ=6THENX=X-1
6Ø IFJ=8ORJ=9ORJ=1ØTHENX=X+1
7Ø GETA$:IFA$>"OR F=Ø THENC=C+1:IFC=16THE
  NC=Ø:FORJ=1TO2ØØ:NEXT
8Ø IFA$="{HOME}"GOTO2Ø
9Ø IFX>39THENX=Ø
1ØØ IFY>24THENY=Ø
11Ø IFX<ØTHENX=39
12Ø IFY<ØTHENY=24
13Ø POKE1Ø24+X+4Ø*Y,81:POKE55296+X+4Ø*Y,C
14Ø GOTO3Ø
```

—ADAM MILLER, BRANDON, SD

### C-128 SPRITE REDUCTION

The following program produces seven consecutive reductions of any sprite you've designed to give the illusion that an object is moving away from the viewer. The program will ask for the sprite number of the sprite you want to reduce. Be sure that any other sprites are saved, since the new sprites will be stored in the sprite area. After the reduction is complete, the sprites will be displayed on the screen for you to view.

```
1Ø REM SPRITE REDUCER-MARCO HAGELSIEB
2Ø INPUT "{SHFT CLR}{4 CRSR DN}s SPRITE NU
  MBER (1-8)";SN:IFSN<1ORSN>8THEN2Ø
3Ø COLOR Ø,7:COLOR4,7:COLOR1,8:GRAPHIC1,1:
  ES=1:SPRSV SN,A$:GSHAPE A$,2Ø,2Ø
4Ø CHAR 1,9,13,CHR$(14)+"{SHFT W}ORKING...
  {SHFT P}LEASE {SHFT W}AIT"
5Ø FOR I=1TO7:ES=ES-.1:EY=ES+.Ø6:PX=1:PY=1
6Ø FOR XX=ØTO24:FORYY=ØTO21
7Ø LOCATE XX+2Ø,YY+2Ø:IFRDOT(2)<>ØTHEN GOS
  UB 12Ø
8Ø NEXTYY,XX,I:SPRSVA$,1:PRINT"{SHFT CLR}
  "
9Ø FOR I=1TO7:SSHAPE B$(I+1),I*25+21,5Ø,I*
  25+43,71:NEXT:GRAPHICØ
1ØØ FOR I=1TO8:SPRITE I,1,1,1:MOVSPR I,5Ø+
  3Ø*I,115:SPRSV B$(I),I
11Ø NEXT:END
12Ø X1=((I*25)+((XX*ES)+(12-(12*ES))))+2Ø:
  Y1=5Ø+((YY*EY)+(1Ø-(1Ø*EY)))
13Ø DRAW 1,X1,Y1:RETURN
```

—MARCO HAGELSIEB  
GUADALAJARA, JALISCO, MEXICO

### MAGIC 80-COLUMN CURSOR

Unlike on the C-64, it's very easy to program a blinking cursor on your C-128's 80-column screen. You simply need only turn the 8563's Cursor mode on and then off when you're done. To turn it on, use BANK15:SYS49182,70. This prints an ESC F through the escape character routine at \$C01E. The accumulator contains the value for the character F. Use SYS 52684,16,10 to turn it off. This will write to register 10 in the 8563 VDC by calling the screen editor routine at \$CDCC in bank 15. The X register must contain the value for the VDC register, and the accumulator holds the data

you wish to write (in this case, 16). The demo program below will show how to put the magic cursor to work in your own programs.

```
1Ø REM MAGIC CURSOR DEMO-BOB KODADEK
2Ø IFPEEK(215)=ØTHENPRINT"8Ø COL ONLY!":EN
  D
3Ø PRINT:PRINT"1. VIEW DIRECTORY"
4Ø PRINT"2. LIST PROGRAM"
5Ø PRINT"3. QUIT DEMO":PRINT
6Ø PRINT"ENTER CHOICE: ";
7Ø BANK 15:SYS49182,7Ø:REM CURSOR ON
8Ø GETKEY A$:K=VAL(A$):IFK<1ORK>3THEN8Ø
9Ø PRINT A$:SYS52684,16,1Ø:REM CURSOR OFF
1ØØ ON K GOSUB 12Ø,13Ø,14Ø
11Ø IF K<>3THEN3Ø:ELSE END
12Ø CATALOG:RETURN
13Ø LIST:RETURN
14Ø PRINT"ALL DONE!":RETURN
```

—BOB KODADEK, ASTON, PA

### 80-COLUMN TOGGLER

Use this simple ML program to toggle between two 80-column screens. Type in the listing below and run it for a brief demo. Note that you should always clear the second screen the first time it is accessed. One warning: If you have any bank-switching in your program, just remember that the routine will always exit in bank 15.

```
1Ø REM TOGGLER 8Ø-EDWARD B SULLIVAN
2Ø PA=4864:FORX=PATOPA+51:READE:POKEX,E:C=
  C+E:NEXT
3Ø IFC<>5611THENPRINT"ERROR!":STOP
4Ø DATA 169,Ø,141,Ø,255,162,12,32,2Ø4,2Ø5,
  141,46,1Ø,169,8,162,2Ø,32,2Ø4,2Ø5
5Ø DATA 141,47,1Ø,96,234,169,Ø,141,Ø,255,1
  69,16,162,12,32,2Ø4,2Ø5,141,46,1Ø
6Ø DATA 169,24,162,2Ø,32,2Ø4,2Ø5,141,47,1Ø
  ,96,234
7Ø S1=PA:S2=PA+25:REM ** DEMO
8Ø PRINT"{SHFT CLR}":KEY1,"SYS"+STR$(S1)+C
  HR$(13):KEY2,"SYS"+STR$(S2)+CHR$(13)
9Ø DIRECTORY:PRINT"SCREEN #1 IS THE DEFAULT
  SCREEN":GETKEYA$
1ØØ SYS S2:PRINT"{SHFT CLR}ALWAYS CLEAR SC
  REEN # 2 THE FIRST TIME ACCESSED":LIST
  :GETKEYA$
11Ø SYSS1:GETKEYA$:SYSS2:GETKEYA$:GOTO11Ø
```

—EDWARD B. SULLIVAN, BRANSON, MO

### C-64 FANCY BORDER PRINTER

The following routine prints a border around the screen in a unique and visually interesting way. The routine starts printing in the middle of the top line and extends toward both sides, then downward and finally inward to the middle of the bottom line. When the routine is finished, the cursor appears at the upper-left corner of the screen.

```
1Ø REM C-64 BORDER PRINTER-J.R.CHARNETSKI
2Ø C$="{CTRL 9}":PRINT"{SHFT CLR}";
3Ø FORI=1TO19:PRINTTAB(2Ø-I)C$TAB(19+I)C$"
```



## MAGIC

```
{HOME}";:NEXT
40 FORI=1TO24:PRINTC$SPC(38)C$;:NEXT
50 PRINTC$TAB(38)C$"{CRSR LF}{SHFT INST} {
  CRSR UP}"
60 FORI=1TO19:PRINTTAB(I)C$TAB(39-I)C$"{CR
  SR UP}";:NEXT
70 FORL=217TO242:POKEL,PEEK(L)OR128:NEXT
80 PRINT"{HOME}":REM RETURN
90 GETA$:IFA$=""THEN90
100 PRINT"{SHFT CLR}";:IFA$="R"THEN30
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### C-64 SCREEN ROW CLEAR

You can clear any single line on the C-64's screen with this line:

```
POKE 781,X:SYS59903
```

The value of X determines the line to be cleared and ranges from 0 to 24. You can clear a section of the screen with a short loop. As an example, the following clears the top 5 lines:

```
FOR X=0 TO 4:POKE 781,X:SYS59903:NEXT
```

—JING BO LI, BROOKLYN, NY

### 13. PROGRAMMING TIPS—SOUND

#### CHARMING MUSIC

I've converted the "Snake Charmer" theme to C-128 music format in the following program. I hope you'll find it "charming" also.

```
10 REM SNAKE CHARMER—JESSE B BROWN
20 ENVELOPE 3,3,0,14,4,0:TEMPO 27
30 PLAY "V104T3U13X0":PLAY"V203T9U6X0":PLAY
  "V3T903U6X0"
40 A$="V2HR V104QDQEM V203WA V303WD V104HFH
  EM V203WA V303WD V104HDQDQEM V203WA V303
  WD V104QFQAQEQFM V203WA V303WD V104HDQDQ
  EM"
50 B$="V203WA V303WD V104HFHEM V203WA V303W
  D V104HDQDQEM V203WA V303WD V104QFQAQEQF
  M V203WA V303WD V104HDQFQGM"
60 C$="V203WA V303WD V104QAQAQAQAM V203WA V
  303WD V104QAQGEQFM V203WA V303WD V104QG
  QGQGM V203WA V303WD V104QGQFQDQEM"
70 D$="V203WA V303WD V104HFHEM V203WA V303W
  D V104HDQDQEM V203WA V303WD V104QFQAQEQF
  M V203HA V303HD V104HDM"
80 PLAY A$+B$:PLAY C$+D$
```

—JESSE B. BROWN, EUNICE, LA

### IRISH JIG 128

Ah, the luck of the Irish! Bring out the "wee bit o' Irish" in your C-128 with this popular Irish jig.

```
10 REM AN IRISH JIG—JESSE BROWN
20 ENVELOPE 0,2,0,15,5,2,200:TEMPO 19
30 PLAY "V104T0U15X0":PLAY"V203T5U15X0":PLA
  Y"V303T6U15X0"
40 A$="V104WRV203.HG V303.HCM V104WR V203.H
  G V303.HCM V203.HC V303.HG V105QEICQEICM
  V203.HC V303.HG V105QEICIGIFIEM V203.HC▶
```

## NOW AVAILABLE FOR THE AMIGA!

### The MicroFlyte JOYSTICK



The only fully proportional continuously variable joystick control for Flight Simulator II

"...it transforms an excellent program into a truly realistic flight simulation system" B.A.C.E.

#### MICROCUBE PRODUCTS

Commodore 64/128	
• MicroFlyte ATC Joystick	\$59.95
• Test/Calibration Disk	\$ 4.95
A diagnostic tool for your joystick	
• F15, Jet Driver Disks (call for availability)	\$ 9.95
Amiga	
• MicroFlyte Joystick	\$119.95
Plugs into the mouse port and works with most software.	

Include \$4.00 shipping of joystick orders. FSII is a trademark of subLOGIC Corp.

Order Direct from:



**MICROCUBE CORPORATION**

PO Box 488  
Leesburg, VA 22075  
(703) 777-7157

Circle 420 on Reader Service card.

## 1-800-248-MICRO

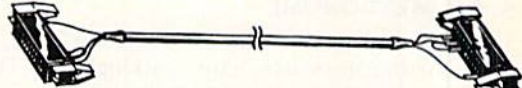
**image<sup>3</sup>**  
TM



#### the 3D graphics program

C-64 + 1541. This is no ordinary graphics program. 3D images having real perspective that you can draw. Position object to view from any angle. STEREOSCOPIC imaging with 3D glasses (4 pair supplied). LEARN command. STARTUP file. Image PRINT DUMP. Over 50 commands.  
26-101 IMAGE 3 ..... \$65 postpaid  
(Canada, foreign add \$2)

#### serial data link cable



Serial data link cable connects two C-64 user ports together for telecommunications projects, interactive games or just for more computing power. The cable appears to the computer on either end as an RS 232 device which can easily be programmed in Basic using commands such as OPEN, CLOSE, PRINT# and INPUT# to transfer data. Installation instructions and programming examples are included.

58-102-XX 10 FOOT SERIAL DATA LINK CABLE ..... \$25 postpaid  
(Canada, foreign add \$2)  
ADDITIONAL 10 FOOT INCREMENTS ..... \$4 postpaid

most orders shipped in 48 hours!  
Micro Development Co.  
PO Box 5872  
Cleveland, Ohio 44101  
(216) 671-3200  
C-64, 1541 TM Commodore Inc.



don't forget . . . these fine products from Micro Development this Christmas!

Circle 421 on Reader Service card.

SPECIAL ISSUE 1988 · R U N 87



## MAGIC

```
V303.HG V105QFIDQFIDM"
50 B$="V203.HC V303.HG V105QFIDIFIEIDM V203
.HC V303.HG V105QEICQEICM V203.HC V303.H
G V105QEICIGIFIEM V203QD V105IFIEIF V203
IRQG V105QD V203IR V105IGM"
60 BB$="V203QC V105IEICIC V203IR V105QC V20
3QC V105IR V203IRM"
70 PLAY A$:PLAY B$:PLAY BB$+A$:PLAY B$+BB$
```

—JESSE B. BROWN, EUNICE, LA

### BACH IS BACK

This program plays a short song written by Johann Sebastian Bach. Just type in the program, run it and enjoy.

```
10 REM HARPSICORD PLAYER-JESSE BROWN
20 TEMPO 17:FILTER 1500,1,0,0,15
30 A$="V104T6X1HA V203T5X1QDQAQD V104IG#IF
V203QA V104IEIDM V104HA V203QDQAQD V10
4IG#IF V203QA V104IEIDM V203WD V104#IFI
GQA#QFM"
40 AA$="V203HA V104QE V203HD V104#QFQDM"
50 AB$="V203HA V104QEOAHD V203HDM"
60 C$="V203WA V104IE#IFQIE#IFQGM V203WD V
104#QFQAHAM V203WA V104IE#IFQIE#IFQGM
V203WD V104#QFQDHDM"
70 PLAY A$:PLAY AA$:PLAY A$:PLAY AB$:PLAY
C$:PLAY A$:TEMPO 15:PLAY AB$
```

—JESSE B. BROWN, EUNICE, LA

### C-64 WINNING FANFARE

Here's a sound effect to reward a winning game player or acknowledge a correct answer. Use it as a subroutine in your C-64 programs.

```
0 REM WINNING FANFARE-J.R.CHARNETSKI
800 T=87:N$="251331421502421502"
810 S=54272:POKES+6,96:POKES+24,15
820 FORI=1TO18 STEP3
830 POKES+1,VAL(MID$(N$,I,2)):POKES+4,33
840 FORJ=1TOT*VAL(MID$(N$,I+2,1)):NEXT
850 POKES+4,0:NEXT:REM [RETURN]
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### C-64 METRONOME

Here's a program that will transform your C-64 into a tempo-setting instrument for marking time. The program produces an animated screen display with a metronome-like sound and runs until you press any key.

```
10 PRINT"{SHFT CLR}C-64 METRONOME - JOSEPH
R. CHARNETSKI"
20 INPUT "(CRSR DN)BEATS PER MINUTE (40-20
8)";N
30 IFN<40 OR N>208THEN END
40 FORI=1TO9
50 B$=B$+"{SHFT M}{CRSR DN}":C$=C$+"{CRSR
UP} "
60 D$=D$+"{CRSR DN}":E$=E$+"{CRSR UP}{SHF
T N}"
70 NEXT
```

```
80 H$="{HOME}{9 CRSR DNs}{10 CRSR RTs}"
90 A$(0)=H$+B$+"*"+C$:A$(1)=H$+D$+"*"+E$
100 S=54272:FORJ=STOS+23:POKEJ,0:NEXT
110 POKES+1,84:POKES+6,9:POKES+24,15
120 Y=1:Z=INT(1299/N*45-N/2)
130 PRINT A$(XANDY):POKES+4,21
140 FOR T=1TOZ:NEXT:POKES+4,20
150 GETK$:IFK$=""THEN X=Y-X:GOTO130
160 PRINT"{SHFT CLR}":POKES+24,0
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### C-64 SYSOUND

Programming the 64's sound chip is tedious at best. My program simplifies the process. To play a sound, use:

SYS 679,AD,SR,HF,LF,W,D

where AD is the attack/decay rate (use values 0-255), SR is the sustain/release rate (values 0-255), HF is the high frequency of the note (INT(frequency/256)), LF is the low frequency (frequency-HF\*256), W is the waveform (triangle=17, sawtooth=33, noise=129) and D is the duration of the sound (0-255). If you accidentally use a duration that's too long, stop it with run-stop/restore. The program uses only voice #1.

```
0 REM C-64 SOUND-RICHARD PENN
10 FORU=679TO753:READQ:POKEU,Q:C=C+Q:NEXT
20 IFC<>9932THENPRINT"CHECK DATA":STOP
30 PRINT:PRINT"SYS 679,A/D,S/R,HF,LF,W,D":
SYS679,0,240,34,75,17,25
40 DATA 32,230,2,169,15,141,24,212,32,241,
183,142,5,212,32,241,183,142
50 DATA 6,212,32,241,183,142,1,212,32,241,
183,142,0,212,32,241,183,142
60 DATA 4,212,32,241,183,134,2,162,10,160,
255,136,208,253,202,208,248,198
70 DATA 2,165,2,208,240,32,230,2,96,160,24
,169,0,153,24,212,136,208
80 DATA 250,96,0
```

—RICHARD PENN, MONTREAL, QUEBEC, CANADA

## 14. PROGRAMS—AMUSEMENTS/ DELIGHTS

### COMMODORE KENTUCKY DERBY

You needn't wait till May to catch triple-crown fever. My program, which runs on the C-64 and C-128 (in 40-Column mode) simulates a thoroughbred race with a field of seven horses and generates odds for each horse. The program gives you \$500 for betting, and the races continue until you run out of money or quit with the stop key.

```
0 REM DARBEE BY PHILIP GEISER
1 M=500:POKE53280,6:POKE53281,6
2 PRINTCHR$(142)"{SHFT CLR}{4 SPACES}{CTRL
8}{CTRL 9} KAINUCKEE DARBEE {CTRL 0}"
3 FORO=1TO7:O(O)=INT(RND(1)*26+1):PRINT"{CO
MD 5}{CTRL 9} HORSE"O"{CRSR LF} {CTRL 0}
ODDS ARE"O(O)"TO 1"
4 PRINT"{CTRL 2} {PI}{CRSR DN}":NEXT:FORO=1
TO7:P(O)=0:NEXT:PRINT:PRINT"{2 CRSR UPS}
```



## MAGIC

```

{CTRL 9}YOU HAVE $"M
5 INPUT" {2 SPACES}-WHAT HORSE TO BET ON";H:
  IFH>7ORH<1THENPRINT" {2 CRSR UPs}":GOTO5
6 INPUT" {2 SPACES}-HOW MUCH MONEY TO BET";B:
  IFB>MTHENPRINT" {2 CRSR UPs}":GOTO6
7 X=INT(RND(1)*7+1):P(X)=P(X)+1
8 PRINT" {HOME}";:FORD=1TOX*3-1:PRINT" {CRSR
  DN}";:NEXT:FORP=1TOP(X):PRINT" ";:NEXT:PR
  INT" {CTRL 2} {PI}"
9 IFP(X)=39THENPRINT" {HOME}"TAB(24)" {CTRL 9
  } WINNER IS # "X:GOTO11
10 GOTO7
11 IFX<>HTHEN13
12 M=M-B+B*(X):FORQ=1TO3000:NEXT:GOTO2
13 M=M-B:FORQ=1TO3000:NEXT:IFM<=0THENPRINT"
  {SHFT CLR}{CTRL 9} * * YOU ARE OUT OF MON
  EY * *":END
14 GOTO2

```

—PHILIP GEISER, STRONGHURST, IL

## KALEIDOSCOPE

Turn your C-128's 40-column screen into an electronic kaleidoscope. The program will run until you press any key.

```

0 REM KALEIDOSCOPE - ROBERT BIXBY
1 GRAPHIC3,1:SCALE1,640,200:COLOR0,1
2 A=INT(RND(TI)*320):B=INT(RND(TI)*200):C
  =INT(RND(TI)*320):D=INT(RND(TI)*200):DR
  AW1,A,BTOC,D
3 FORI=1TO3:COLORI,RND(TI)*16+1:DRAWI,A,B
  TOC,D
4 DRAWI,319-A,199-BTO319-C,199-D
5 DRAWI,319-A,BTO319-C,D
6 DRAWI,A,199-BTOC,199-D:A=C:B=D:C=INT(RN
  D(TI)*320):D=INT(RND(TI)*200):COLORI,RN
  D(TI)*16+1:NEXT:GET A$:IF A$="" GOTO30:
  ELSE GRAPHIC 0:COLOR5,2:END

```

—ROBERT BIXBY, KALAMAZOO, MI

## MAGIC NUMBER-GUESSER

Amuse and mystify your friends with my magic number-guesser program. Just follow the prompts on the screen.

```

1 REM MAGIC NUMBER-NEVIN FAHS
2 PRINT" {SHFT CLR} {2 CRSR DNs} FOR FURTHER
  INSTRUCTIONS PRESS ANY KEY"
3 PRINT"WRITE DOWN ANY 5 DIGIT RANDOM NUM
  BER":GOSUB110
4 PRINT"NOW RE-ARRANGE THE DIGITS IN ANY
  ORDER {2 SPACES}";
5 PRINT "AND SUBTRACT SMALLER FROM LARGER
  .":GOSUB110
6 PRINT"CROSS OUT ANY DIGIT (EXCEPT ZERO)
  AND {3 SPACES} TYPE IN THE REMAINING NUM
  BER"
7 INPUT A$
8 FOR T=1TO4:X=X+VAL(MID$(A$,T,1)):NEXT
9 X=X-INT(X/9)*9
10 Y=9-X:PRINT" {SHFT CLR} THE NUMBER YOU C
  ROSSED OUT WAS"Y:END
11 GET S$:IF S$="" THEN110
12 PRINT:RETURN

```

—NEVIN FAHS, HONOLULU, HI

## SIMPLE C-64 PIANO

I programmed this short top-row keyboard piano for quick key response. I find it nice to play simple tunes on. The number row is for sharps and flats and the second row is for regular notes.

```

1 REM 64 PIANO-ANDREW SENFT
2 S=54272:FORZ=STOS+27:POKEZ,0:NEXT:POKES
  +24,15:POKES+6,127:POKES+4,35
3 F%=1145:DATA62,59,9,8,14,17,16,22,19,25
  ,24,30,33,32,38,35,41,46,43,49,48,54
4 FORZ=0TO127:POKE49152+Z,0:NEXT:FORZ=1TO
  22:READK%:T%=2{UP ARROW}(1/12)*F%+.5
5 F%=T%:POKE49152+K%,T%/256:POKE49216+K%,
  (T%/256-PEEK(49152+K%))*256:NEXT
6 DATA 166,197,189,0,192,201,0,240,247,14
  1,1,212,189,64,192,141
7 DATA 0,212,228,197,240,252,169,0,141,1,
  212,141,0,212,76,128,192,0
8 FORZ=0TO32:READA%:POKE49280+Z,A%:NEXT
9 PRINT" {2 CRSR DNs} SIMPLE PIANO BY ANDRE
  W SENFT":SYS49280

```

—ANDREW SENFT, AUBURN, NY

## REFLECTIONS ON THE C-128

This program lets you create some interesting graphics displays. It uses a joystick in port 1 to move the cursor around the hi-res screen. (Draw in the lower-left corner so the cursor directions will seem correct.) The display is reflected four times around the screen as the cursor draws. Clear the screen with the fire-button.

```

1 REM REFLECTIONS - JON ALLEN
2 SLOW:GRAPHIC1,1:COLOR0,1:COLOR1,8
3 COLOR4,1:SCALE1:X=750:Y=250
4 J=JOY(1):IFJ=128THENSCNCLR
5 IFJ=1ORJ=2ORJ=8THENY=Y+10
6 IFJ=6ORJ=5ORJ=4THENY=Y-10
7 IFJ=8ORJ=7ORJ=6THENX=X-10
8 IFJ=2ORJ=3ORJ=4THENX=X+10
9 IFX<0THENX=0
10 IFX<0THENX=0
11 IFY<0THENY=0
12 IFX>1000THENX=1000
13 IFY>1000THENY=1000
14 DRAW1,X,Y:DRAW1,1000-X,Y
15 DRAW1,X,1000-Y:DRAW1,1000-X,1000-Y
16 GETA$:IFA$="(LB.)"THENGRAHPIC0:PRINT" {
  CTRL 2}":END
17 GOTO40

```

—JON ALLEN, NEWFANE, NY

## 15. PROGRAMS—COMMERCIAL SOFTWARE

### STUCK ON KOALAPAD

I've got a simple solution for those of you who are tired of hunting down the stylus for your KoalaPad every time you need to use it—attach it to the pad with Velcro. Put the soft, furry part of the Velcro on the stylus and the hooked part ▶



## MAGIC

on the pad, right behind the buttons. The buttons provide additional protection for the stylus.

—CHANCE AGRELLA, PRESCOTT, AZ

### MAKE IT EASY ON YOURSELF

Make a hard copy of the different fonts and type styles available in GEOS. It's much easier to select the style and size this way.

—ADA D. KIRKMAN, MT. PLEASANT, SC

### DFMAIL RECORD GROUPS

Adding the following lines to DFMail (*RUN*, December 1984) will print selected parts of a mailing list. It's useful, for example, for addressing a mailing to club members who have not paid their dues. First, sort on a field containing dues payment information, then view to see the first and last record numbers of those who have not paid. You can then print labels for just the delinquent members.

```
1047 PRINT"{CRSR DN}{4 SPACES}{CTRL 9}C{CTR
L 0}ONSECUTIVE GROUP OF RECORDS"
1059 IFC$="C"GOTO1326
1326 INPUT"BEGIN WITH WHICH RECORD (0 TO EX
IT)";FS:IFFS=0GOTO1040
1328 IFFS>XTHENPRINT"NO SUCH RECORD":GOTO13
26
1330 INPUT"END WITH WHICH RECORD (0 TO EXIT
)";LS:IPLS=0GOTO1040
1332 IPLS<FSTHENPRINT"TRY AGAIN!":GOTO1326
1334 FORI=FSTOLS:GOSUB1268:NEXT:GOTO1040
```

—STANLEY L. ANDERSON, TISHOMINGO, OK

### FROM HI-RES TO ULTRA HI-RES

My program converts a 40-column hi-res picture to Ultra Hi-Res format. The original picture should be loaded in as a picture (use BLOAD"NAME",P8192 to load just the picture, and substitute P7168 in the BLoad command to load the picture and color) and then saved to disk with BSAVE "filename",B0,P8192 TO P16384. Then load and run the VIC/ Ultra Hi-Res program.

The program converts the 320 x 200-pixel format of the VIC screen to the 640 x 200 format of the 80-column hi-res screen. In addition, the width is stretched in the process. This takes about five minutes in Fast mode. Now load the Ultra Hi-Res program and run it. You can then load your picture with @LOAD,0,"filename".

```
10 REM VIC=>U.H.RES-DANIEL MONTES
20 REM ML SUB BY JIM BORDEN
30 FAST:DIM A$(319)
40 FOR K=4864TO4904:READX:POKEK,X:NEXT
50 DATA 141,41,19,169,2,141,42,19,169,0,162
60 DATA 255,232,224,4,240,10,14,41,19,144,2
70 DATA 29,37,19,176,241,72,206,42,19,208,2
80 DATA 104,170,104,96,192,48,12,3
90 PRINT:INPUT"SOURCE FILENAME";S$
100 DOPEN#8,(S$+"P"):IF DSTHENPRINT:PRINTD
S$:DCLOSE#8:GOTO90
110 PRINT:INPUT"ULTRA FILENAME ";T$
120 DOPEN#9,(T$+"P,W"):IF DSTHENPRINT:PRIN
TDS$:DCLOSE#9:GOTO110
130 PRINT:PRINT"WORKING ON ROW:";
```

```
140 GET#8,C$,C$:FORF=1TO25:PRINTF;
150 FORI=0TO319:GET#8,A$(I):NEXT
160 FORJ=0TO7:FORI=JTOJ+312STEP8
170 A1=(ASC(A$(I)+CHR$(0)))
180 SYS4864,A1:RREG A1,X1
190 PRINT#9,CHR$(A1)CHR$(X1);
200 NEXT:NEXT:NEXT:DCLOSE:PRINTCHR$(7)
```

—DANIEL MONTES, CORDOBA, ARGENTINA

### DATAFILE FIND OPTION IMPROVEMENT

I've made some changes to Mike Konshak's excellent Datafile program so that you can use its Find option to locate a keyword anywhere within a field. The original Datafile only found a match at the beginning of a field. Make these changes to the program:

```
1 REM DATAFILE SUBSTRING FIND-KENNY LAWSON
229 LT=LEN(T$)
231 FORQQ=ITOLEN(REC$(K%(I),SF)-LT+1)
232 IFT$=MID$(REC$(K%(I),SF),QQ,LT)GOTO236
233 NEXT
```

The changes should work on any Commodore computer. However, if you're using a C-128 in 128 mode, you can use this line to replace all of the above lines:

```
232 IFINSTR(REC$(K%(I),SF),T$)GOTO236
```

Please note that this could be used as a keyword search subroutine in your own applications programs, also. Just be sure that your program uses the proper variable names.

—KENNY LAWSON, INDIANAPOLIS, IN

### ULTRA HI-RES HELPER

The Ultra Hi-Res Graphics program from the February 1986 issue of *RUN* is fantastic, but trying to draw at the right locations can be a real problem. The Ultra Hi-Res Helper routine to the rescue!

Place the Helper at the end of the Draw statements in your program. When you run your program, use the keypad to move the dot you see on the screen to the location you want, then press the plus key, and the current X and Y locations will be printed on the screen. You can then move to another location and press the plus key again. When you've located all the points, press the minus key to exit the program. If your program already has an error trap at 10000, you can leave out line 10000.

```
1 REM ULTRA HI RES HELPER-J. W. JARVIS
1000 X=320:Y=100
1002 @DOT,X,Y,1:GETKEY K$:K=VAL(K$)
1004 IFK$="+ "THEN L$="X="+STR$(X)+" Y="+STR
$(Y):@CHAR,53248,200,100,1,1,L$
1006 IFK$="- "THEN 10000
1008 IF K=5 OR K=0THEN1002:ELSE @DOT,X,Y,0
1010 IFK=2 THEN Y=Y+1
1012 IFK=8 THEN Y=Y-1
1014 IFK=4 THEN X=X-1
1016 IFK=6 THEN X=X+1
1018 IFK=7 THEN X=X-1:Y=Y-1
1020 IFK=9 THEN X=X+1:Y=Y-1
1022 IFK=3 THEN X=X+1:Y=Y+1
1024 IFK=1 THEN X=X-1:Y=Y+1
1026 GOTO 1002
10000 @TEXT:HELP:END
```

—JERRY W. JARVIS, SPOKANE, WA



## MAGIC

### EASY EYE-CATCHER

For our users group's computer fair, I altered the White Hole trick (below), which prints messages on the screen, to generate a continuous display timed by a For-Next loop. It works on both the C-64 and C-128.

```

10 REM C-64/C-128 WHITE HOLE - ERIC J. BRUN
   O
20 PRINT "{SHFT CLR}":POKE53280,0:POKE53281,
   0
30 M$="{CTRL 9}{CTRL 3}{3 SPACES}THIS IS TH
   E 'WHITE HOLE' TRICK{3 SPACES}":PL$="{HO
   ME}{8 CRSR DNS}":GOSUB100000
40 M$="{CTRL 9}{CTRL 2}INSERT NEW TEXT IN L
   INES 30,40,& 50."":PL$=PL$+"{2 CRSR DNS}
   ":GOSUB100000
50 M$="{CTRL 9}{COMD 7}{6 SPACES}PRESS ANY
   KEY TO CONTINUE.{4 SPACES}":PL$=PL$+"{2
   CRSR DNS}":GOSUB100000
60 GETA$:IFA$=""THEN60
70 END
100000 L=LEN(M$):MI=38-L/2:FORI=1TOLEN(M$)-1
   9
10010 PRINTPL$SPC(MI)LEFT$(M$,I)RIGHT$(M$,L
   -(L-I)):MI=MI-1:NEXT:RETURN
  
```

I made the following changes to the trick:

```

5 PRINT "{SHIFT CLEAR}"
60 FOR X=1TO3500:NEXT
70 GOTO 5
  
```

I then used lines 30-50 for the message. Extra lines can be added to allow several screens of text. The display is easy to write and a real attention-getter!

—HARRY A. TELLIER, DENTON, NC

### PRINT SHOP MAILERS

My program prints mailers for the quarter-fold cards created by The Print Shop. It prints a mailer on a sheet of standard paper, then moves to the next sheet so you can print another one. If you own a word processor with a mail-merge option, you can print the mailer outline, then run the paper through a second time and use mail-merge to address it.

```

10 REM PRINT SHOP ENVELOPES-LONNIE BROWN
20 OPEN4,4:CMD4
30 PRINTSPC(10);:PRINT"!";:FORX=1TO56:PRINT
   "-";:NEXT:PRINT"!";
40 FORZ=2TO12:PRINTSPC(10)"!";:FORX=1TO56:P
   RINT" ";:NEXT:PRINT"!";:NEXT
50 PRINTSPC(4)"!";:FORX=1TO68:PRINT"-";:NE
   XT:PRINT"!";
60 FORZ=14TO39:PRINTSPC(4)"!";:FOR
   X=1TO56:PRINT" ";:NEXT
70 PRINT"!";:SPC(5)"!";:NEXT
80 PRINTSPC(4);:PRINT"!";:FORX=1TO68:PRINT
   "-";:NEXT:PRINT"!";
90 FORZ=40TO59:PRINTSPC(10)"!";:FORX=1TO56:
   PRINT" ";:NEXT:PRINT"!";:NEXT
100 PRINTSPC(10);:PRINT"!";:FORX=1TO56:PRIN
   T"-";:NEXT:PRINT"!";
110 FORX=1TO4:PRINT#4:NEXT:CLOSE4
  
```

—LONNIE BROWN, LAKELAND, FL ▶

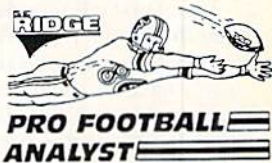
## WIN LOTTO MILLIONS!!! NEW! LOTTO PICKER™ PLUS v2.0

Lotto Picker™ Plus stores winning Lotto 6, Keno, & Pick 3/4 numbers & uses statistical analysis to select what might be your million dollar ticket! All U.S. & Canadian games are included. v2.0 features speed boosts up to 70%, a database editor, and much more. For C-64/128 (No AMIGA) and IBM & Compsats. Never Obsolete—Pays for itself! \$34.95 (Plus \$4.55 S&H).



## BEAT THE POINT SPREAD!

Handicap NFL games against the point spread easily and profitably with your computer! Only 5 minutes/week & your local newspaper is needed to uncover hidden overlays in the betting line. A winning season of Best Bets is GUARANTEED or your MONEY BACK! For Commodore 64 & 128 (no Amiga), and IBM & Compsats. Save shipping order by mail \$34.95 (Plus \$4.55 S&H) to:



**GE RIDGE SERVICES, INC.**

170 Broadway, Suite 201-R  
New York, NY 10038

ORDERS: 1-800-634-5463 Ext. 293

Write for free catalog  
Dealers/Inquiries 718-317-1961.

Circle 422 on Reader Service card.

## I Saved Time and Money with Physical Exam

I use a data base to keep records for our club. Last week I experienced read errors. Luckily I have a 1541 Physical Exam program. The alignment test confirmed what I had suspected, my drive was out of alignment. I am happy to report that I aligned my drive MYSELF. I avoided the wait for repair and paid a fraction of the cost.



Please specify  
drive 1541,  
1571, 8050,  
8250, 4040, or  
SFD 1001

Package includes: • True digital alignment disk with offset tracks. • Mechanical Stop Test • Speed test • Illustrated manual with instructions for performing alignment, adjusting speed and stop position. • Hard copy mode to print test results for future reference.

**Physical Exam \$39.95** Plus S & H!

Cardinal Software, 14840 Build America Dr.,  
Woodbridge, VA 22191 Info: (703) 491-6494

Orders: **800 762-5645**

Circle 406 on Reader Service card.

SPECIAL ISSUE 1988 · R U N 91



## MAGIC

### FAST LOAD DIRECTORY PAUSE

Directories longer than 25 lines are difficult to view with the Fast Load cartridge, since there's no provision for pausing the screen. To pause the directory listing, load the directory as a Basic file with the command /\$ and list it. Slow down the scrolling listing with the control key and pause it with the stop key. Of course, this method will overwrite any program in memory when the directory is loaded.

—RUDY MCDANIEL, APO, NY

### REMINDER 128 REVISITED

If you make Reminder 128, *RUN's* electronic desk calendar (see the January 1987 issue), the autoboot program on your most frequently used disk, such as your word processor, you won't have to remember to run it. I use RUN Script often, so I made up a disk with the RUN Script files on it along with the Reminder 128 program. You can put Reminder 128 as the first program and run it with the shifted run-stop key or add a boot sector. Make the following change to the Reminder 128 program before saving it to the new disk:

```
2295 PRINT "LOADING RUN SCRIPT. . ."
2297 RUN "BOOT"
```

If you want to run a machine language program, replace the Run command with BOOT in line 2297. Now, after your appointment calendar is checked, your word processor will be loaded for your use. (Change the text in quotes to suit your own program.)

—RANDY W. BARTHEL, CINCINNATI, OH

### FAST-RUN

The instruction manual for my Epyx Fast Load cartridge does not give a command for loading and running any Basic program. However, you can easily do this by adding a delimiter to the end of the filename. Then use shifted run-stop. The asterisk (\*) is the best delimiter, since it will serve double-duty as both a wild card in the filename and as the delimiter.

Here's an example of loading the first file on the disk that begins with the letters DO: /DO\*{shift/run-stop}

Note that a colon isn't necessary.

—ROBERT E. TUM SUDEN, FLORAL PARK, NY

### HELPFUL C-128 KEYPAD

After using the 128 Keypad program in 64 mode (see *RUN's* Mega-Magic, May 1987) for a while, I decided to try it with Timework's Electronic Checkbook program. It works just fine!

If you have a C-128 and use it for C-64 commercial software, try loading and running the 128 Keypad program before you load the commercial program. If they work together, entering numeric data is much easier.

—JAMES R. JONES, CHILlicothe, OH

### ENHANCED 64 NOTEPAD MENU

Here's an enhanced version of the main menu of Bob Kodadek's fine 64 Notepad V3.0 program (see listing 3 on page 47 of the June 1987 issue of *RUN*). Load that listing and change or add the lines below:

```
Ø REM NOTEPAD MENU—FRANK S RUARK
1ØØ PRINT CHR$(147)SPC(92)F$
```

```
11Ø PRINT SPC(82)"1.PRESS CTRL-O TO OPEN W
INDOW."
111 PRINT SPC(44)"A. SHIFT-CLR ERASES GARB
AGE"
112 PRINT SPC(4)"B. CTRL-D LISTS 1-KEY DOS
COMMANDS"
113 PRINT SPC(4)"C. CTRL-P CHANGES TEXT CO
LOR"
114 PRINT SPC(4)"D. F1 SAVES WINDOW"
115 PRINT SPC(4)"E. F3 PRINTS WINDOW"
116 PRINT SPC(4)"F. F5 PRINTS FULL SCREEN"

117 PRINT SPC(4)"G. F7 LOADS A SAVED WINDO
W"
12Ø PRINT SPC(42)"2.PRESS CTRL-C TO CLOSE
WINDOW."
13Ø PRINT SPC(82)"3.PRESS RUN/STOP-RESTORE
TO DISABLE."
14Ø PRINT SPC(82)"4.TO RE-ENABLE, ENTER SY
S 51Ø72.":SYS51Ø72
15Ø NEW
```

Slight changes in the SPC() entries of lines 100, 110, 120, 130 and 140 make room for the new lines 111–117 above. Now all functions appear on the menu, indented to show that they are executed inside the opened window.

—FRANK S. RUARK, WINSTON-SALEM, NC

## 16. PROGRAMS—USEFUL APPLICATIONS

### UNIVERSAL NOTE-MAKER

You can make a mini word processor by entering text as program lines. Use a Poke to remove the line numbers when you're ready to print out or to just display it on the screen. First type in your message just like a Basic program, with line numbers. Don't worry about syntax; just don't begin your lines with REM. The following line works with the C-64, Plus/4 and C-16, but you cannot use shifted characters in this "word processor", since Basic will ignore them.

```
POKE22,35:OPEN4,4:CMD4:LIST:PRINT#4:CLOSE4:POKE22,25
```

For the C-128, change the values to POKE24,37 and POKE24,27, respectively.

—MARK A. HERMANN, PARK RIDGE, IL

### GUITAR-TUNING AID

This C-64 program produces reference tones by which to adjust the string tensions on your guitar. Each reference tone continues to sound until you press the space bar for the next tone.

```
1Ø PRINT"(SHFT CLR)C-64 GUITAR TUNING AID
- J.R.CHARNETSKI"
2Ø FORI=1TO6:READL(I),H(I):NEXT
3Ø R=54272:FORI=RTOR+23:POKEI,Ø:NEXT
4Ø POKER+5,1Ø2:POKER+6,1Ø2:POKER+24,15
5Ø PRINT"{2 CRSR DNS}PRESS{CRSR DN}"
6Ø PRINT"ANY KEY TO TURN SOUND ON OR OFF"
7Ø PRINT"SPACE BAR FOR NEXT STRING SOUND"
8Ø PRINT"ANY FUNCTION KEY TO END PROGRAM"
9Ø GET A$:IF A$=""THEN9Ø
```



```

00 POKER+4,0
10 IFA$=CHR$(32)THEN I=I+1:GOTO140
20 IFA$>CHR$(132) AND A$<CHR$(141)THENPOK
ER+24,0:END
130 IF X THEN X=0:GOTO90
140 IF I>6THEN I=1
150 POKER,L(I):POKER+1,H(I)
160 POKER+4,33:X=I:GOTO90
170 DATA 71,5,12,7,104,9,142,12,210,15,30,
21
    
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

## WATCHING IRA GROW

This short program shows you how your IRA account can grow. It's only an estimate, because interest rates vary over the years. Also, the program uses simple interest added once a year, rather than compound interest, so your IRA will probably earn more than this program indicates.

```

10 REM IRA ESTIMATE-DAVID ADAMS
20 PRINT"HOW MUCH WOULD YOU LIKE TO"
30 INPUT"INVEST YEARLY";A:PRINT
40 PRINT"HOW MANY YEARS WOULD YOU"
50 INPUT"LIKE TO INVEST YOUR MONEY";X:PRIN
T
60 PRINT"WHAT PERCENT INTEREST WILL"
70 INPUT"YOU BE RECEIVING (DECIMAL)";C
80 PRINT:PRINT:PRINT"YEAR","BALANCE","INTE
REST","TOTAL"
90 FORZ=1TO39:PRINT"*";:NEXT:PRINT
100 FORY=1TOX:B=A+T:I=C*B:T=B+I:Z=T+Z:L=L+
I
110 PRINTY,B,I,T:NEXT Y
120 FORZ=1TO39:PRINT"*";:NEXT:PRINT
130 PRINT:PRINT:PRINT"THE TOTAL RECEIVED W
AS" T
140 PRINT"THE TOTAL INTEREST WAS" L
    
```

—DAVID ADAMS, PORTAGE, IN

## INTERESTING FIGURES

If you're speculating on the future value of an investment that accumulates interest at a fixed rate, use this program to calculate the interest on your principal when interest is compounded daily, monthly or quarterly. The program displays the interest and rounds the total (interest and principal) to two decimal places. It works on any computer.

```

10 REM INTEREST CALCULATOR-MARIE CHARNETSK
I
20 PRINT"{SHIFT CLR}{CRSR DN}IS THE INTERES
T COMPOUNDED BY"
30 INPUT "(D)AY (M)ONTH OR (Q)UARTER";A$
40 INPUT"{CRSR DN}ANNUAL INTEREST RATE (AS
%)";R
50 INPUT "{CRSR DN}AMOUNT OF PRINCIPAL";P
60 INPUT "{CRSR DN} FOR HOW MANY MONTHS";T
70 I=12:IFA$="D"THEN I=365
30 IF A$="Q" THEN I=4
10 C=R/100/I:J=T/12*I:S=P
00 R=C+1:P=R(UP ARROW)J*P
10 T$=MID$(STR$(INT(P/.01+.5)),2)
    
```

```

120 T$=LEFT$(T$,LEN(T$)-2)+". "+RIGHT$(T$,2
)
130 PRINT"(CRSR DN)TOTAL INTEREST={CTRL 9)
"P-S
140 PRINT"(CRSR DN)PRINCIPAL+INTEREST=$"T
$
    
```

—MARIE CHARNETSKI, PLAINS, PA

## CHECKLIST PRINTER

This handy program makes it easy to create checklists that have the customary box for the check mark before each item. The program's default values give a left margin of 10 and single spacing. I wrote the program for the MPS-803 printer, but if you have a Star printer, remove the first REM in line 35. The box will be slightly smaller. It works on any computer.

```

0 REM CHECKLIST PRINTER-J.R.CHARNETSKI
10 PRINT"{SHIFT CLR}"
20 A$=CHR$(8):B$=CHR$(255):C$=CHR$(193)
30 A$=A$+B$+C$+C$+C$+B$+CHR$(15)+" "
35 REM A$=CHR$(175)+" ":REM FOR STAR PRINT
ER
40 INPUT"HOW MANY ITEMS";N:DIM I$(N)
50 FOR J=1TON:INPUT I$(J):NEXT
60 M=10:INPUT"LEFT MARGIN";M
70 S=1:INPUT"SPACING (1-3)";S:OPEN4,4,7
80 FORJ=1TON:PRINT#4,SPC(M)A$I$(J)
90 IFS>1THENFORL=2TOS:PRINT#4:NEXT
100 NEXT:INPUT"PRINT IT AGAIN (Y/N)";K$
110 IFK$="Y"GOTO80
120 CLOSE4
    
```

—JOSEPH R. CHARNETSKI, DALLAS, PA

## 17. PROGRAMS—UTILITIES

### PET-TO-ASCII

Have you discovered to your chagrin that non-Commodore computers do not appreciate receiving PETASCII character codes sent by modem? Try using this short program to convert your sequential text files to standard ASCII before you send them to one of those computers.

```

0 REM PET-TO-ASCII - GREG DIXON
10 OPEN2,8,2,"SOURCEFILE,S,R":OPEN5,8,5,"EN
DFILE,S,W"
20 IFEX=64 GOTO 80
30 GET#2,Z$:Z=ASC(Z$):PRINTZ$;:EX=ST
40 IFZ>192 THEN IF Z<219 THEN Z=Z-128:GOTO6
0
50 IFZ>64 THEN IF Z<91 THEN Z=Z+32
60 Z$=CHR$(Z):PRINT#5,Z$;
70 GOTO20
80 CLOSE2:CLOSE5:END
    
```

—GREG DIXON, NORTH VANCOUVER, B.C., CANADA

### SOLO LABELS

If you need to print just one address label and don't want to bother with loading the database, try this easy-to-use program. Just follow the prompts. Use the run-stop/restore combination when you're finished with the program. ▶



## MAGIC

Because this is an input/output program, you cannot use commas, colons or semicolons in your data unless you begin the text with quotes. You also have to set your own print tabs for the printer you have (see your printer manual for details).

```
1Ø REM ONE LABEL-MARK GALLOWAY
2Ø INPUT"{SHFT CLR}{CTRL N}{2 CRSR DN}s}NAME
   {6 SPACE}s}";N$
3Ø INPUT"ADDRESS{3 SPACE}s}";AD$
4Ø INPUT"CITY/STATE";CT$
5Ø INPUT"ZIP CODE{2 SPACE}s}";ZP$
6Ø PRINT"{2 CRSR DN}s}IS THIS CORRECT? (Y/N)
   "
7Ø GET A$:IF A$=""GOTO 7Ø
8Ø IF A$="Y" GOTO 1ØØ
9Ø IF A$="N" GOTO2Ø
1ØØ OPEN 3,4
11Ø CMD3:PRINT:PRINTN$
12Ø PRINTAD$:PRINTCT$"{2 SPACE}s}"ZP$
13Ø PRINT#3:CLOSE3:GOTO2Ø
```

—MARK C. GALLOWAY, BEDFORD HILLS, NY

### HELP-FILE READER

In order to print a help screen within a program I was writing, I needed a routine like C-128 GETspeed, but altered so it wouldn't interfere with the program in memory.

I also had to relocate the code so I could use cassette or disk. I chose \$1300 (decimal 4864) as the starting location and made these changes to the original program:

```
1Ø REM HELP FILES-RICHARD HERRMANN
2Ø FORI=4864TO4918:READT:POKEI,T:CK=CK+T:N
   EXT
3Ø IFCK<>7665THENPRINT"ERROR":END
4Ø DATA 16Ø,Ø,185,64,19,24Ø,3,2ØØ
5Ø DATA 2Ø8,248,152,162,64,16Ø,19,32
6Ø DATA 189,255,169,5,168,162,8,32
7Ø DATA 186,255,32,192,255,162,5,32
8Ø DATA 198,255,32,2Ø7,255,32,21Ø,255
9Ø DATA 32,183,255,24Ø,245,32,2Ø4,255
1ØØ DATA 169,5,32,195,255,96,ØØ
19999 END
2ØØØØ FOR I=1TOLEN(H$):POKE 4927+I,ASC(MID
   $(H$,I,1)):NEXT
2ØØ1Ø POKE 4927+I,Ø:SYS4864:GETKEY K$:RETRN
2ØØ2Ø REM END FILENAME:CALL ML:WAIT FOR KE
   YPRESS
```

The subroutine at 20000 pokes the filename into memory for the machine language code. Of course, you must run lines 20-100 above before accessing the File Reader subroutine. An example of how to use the program, assuming that you name your help file HELPFIL, is shown below:

```
1000 GETKEY Q$:IF Q$="{CTRL H}" THEN
   H$="HELPFIL":GOSUB20000
```

I hope other readers find this trick as useful as I have.

—RICHARD HERRMANN, BROOKHAVEN, NY

### ENVELOPE ADDRESSER

Here's a program to address business-size envelopes. I use it each month when paying bills and sending letters to friends. Once you save the program, load and list it, change the lines to the address you need and save it under a new

name. When you run the program, it will print your return address first and then the recipient's address.

```
Ø REM ENVELOPE ADDRESSER-JUDY ROBERTS
1Ø OPEN1,4:CMD1,"";
2Ø PRINT"{SHFT Y}OUR ADDRESS HERE"
3Ø PRINT"{SHFT Y}OUR STREET"
4Ø PRINT"{SHFT C}ITY, {SHFT S}TATE ZIP"
5Ø FORX=1TO8:PRINT:NEXT
6Ø PRINTSPC(3Ø)"{SHFT A}DDRESSEE'S NAME"
7Ø PRINTSPC(3Ø)"{SHFT A}DDRESSEE'S STREET"
8Ø PRINTSPC(3Ø)"{SHFT A}DDRESSEE'S CITY, S
   TATE, ZIP"
9Ø PRINT#1:CLOSE1
```

—JUDY ROBERTS, PHELPS, KY

### PAGE PRINTER

When printing program listings on my MPS-801 printer, I find it difficult to line up the paper so that some line of text isn't cut in half by the perforations. The short program below allows you to set a bottom margin to overcome this problem.

```
1Ø REM PAGE - MICHAEL MYERS
2Ø FORI=531ØØTO53189:READQ:POKEI,Q:CK=CK+Q
   :NEXT
3Ø IFCK<>13Ø39THENPRINT"ERROR IN DATA"
4Ø DATA 169,157,141,38,3,169,2Ø7,141,39,3,
   169,3,133,252,32,253
5Ø DATA 174,32,1Ø7,169,165,2Ø,72,198,252,2
   Ø8,243,1Ø4,141,172,2Ø7,1Ø4
6Ø DATA 141,166,2Ø7,1Ø4,141,148,2Ø7,169,66
   ,133,251,32,253,174,76,164
7Ø DATA 166,2Ø1,13,2Ø8,31,198,251,165,251,
   2Ø1,2,2Ø8,21,138,72,162
8Ø DATA 3,189,192,2Ø7,32,21Ø,255,198,251,2
   Ø8,249,1Ø4,17Ø,173,148,2Ø7
9Ø DATA 133,251,169,13,76,2Ø2,241,141,1Ø,1
   Ø
```

To use the new page lister, use the following syntax:  
OPEN4,4:CMD4:SYS53100,page length,bottom margin,device number,range

The Open and CMD statements are only required for output to the printer. The page length should be from two to 66 lines, and the bottom margin must be at least one line, but less than the page length. Send the listing to the screen with device number 3, or use your printer's device number for a hard copy. The range is the same as that used after the Basic list command.

To send output to your printer, type PRINT#4:CLOSE4 to clear the channel. You should press run-stop/restore when the listing is finished to restore the pointers used by the Kernal CHROUT routine.

If you want to double-space your listing, use a page length of 2 and a bottom margin of 1.

—MICHAEL MYERS, BEARDSTOWN, IL

### UNIVERSAL DISK DEFAULT

This update to Magic trick \$3CE (April 1987) runs on any Commodore computer. The program allows you to relocate



## MAGIC

the machine language code to any 15 free bytes in memory. Just change SA to 49152 or 828 in line 5 and save the program.

```
1Ø REM UNIVERSAL DISK DEFAULTER-BEN FROST
2Ø SA=49152:REM CHANGE THIS ADDR
3Ø V1=SA/256
4Ø V2=(V1-INT(V1))*256
5Ø FORT=SATO T+15:READN:POKET,N:NEXT
6Ø POKESA+11,PEEK(816):POKESA+12,PEEK(817)

7Ø POKESA+14,PEEK(818):POKESA+15,PEEK(819)

8Ø POKE816,V2:POKE817,V1:POKE818,V2+2:POKE
819,V1
9Ø DATA 16Ø,1,162,8,134,186,192,1,2Ø8,3,76
,Ø,Ø,76,Ø,Ø
```

—BEN FROST, EDMORE, MI

### C-128 CHECKSUM LIST

If you submit your Magic trick program listings to *RUN* in hard copy, it'll help the staff type in the listings if you use the following program to print out checksums:

```
1Ø REM 128 CHECKSUM LIST-LARRY PANKEY
2Ø KEY1,CHR$(147)+"L=VAL(L$):L=L+1Ø:L$=STR
$(L)+"CHR$(13)+"KEY3,"+CHR$(34)+"LIST"+
CHR$(34)+"L$+CHR$(13)+"CHR$(13)
3Ø KEY5,"{4 CRSR UPs}"+"CHR$(13)
4Ø KEY7,"{15 SHFT INSTs}PRINT#4,L$"+CHR$(3
4)+"":REM*"+CHR$(13)
5Ø KEY4,"CLOSE4:OPEN4,4:L$="+CHR$(34)+CHR$
(34)+CHR$(13)+"63999 ":"+CHR$(13)+CHR$(1
47)
6Ø KEY8,"L$="+CHR$(34)+CHR$(34)+"":CLOSE4"+
CHR$(13)+"63999"+CHR$(13)+CHR$(147)
7Ø PRINTCHR$(147):END
```

My program generates checksums for lines starting with 10 and incremented by 10.

Once you have your trick debugged, renumber it. To use the checksum generator, first load and run the 128 Perfect Typist program. Then load and run the checksum generator program, and finally load your trick. Turn your printer on and align the paper, then press F4 to open a file to the printer. Now press F1, F3, F5 and F7 in that order. This will send the first line and the checksum to the printer.

Repeat the sequence until you get an error. This will indicate that all lines are done. Then, press the F8 key to close the printer file. Finally, add the checksums to the trick.

—LARRY PANKEY, DANA POINT, CA

## 18. WORD PROCESSORS

### RUN SCRIPT DEFAULT FILE

Forgetting to give your document a filename when saving it in RUN Script 2.40 makes the program save the file with the default load name, "", as the filename. Take advantage of this "error" by giving the default load name to a file you use often. Then, to load it, you just have to press F1 and L. When you want to scratch the file from RUN Script, use a

question mark as the filename. Just be sure no other single-character filenames are on the disk, or they'll be erased, too.

—JIM BORDEN, CARLISLE, PA

### A SIMPLE THOUGHT PROCESSOR

If your word processor has a block-move function, as in RUN Script 64 or 128, you already have a simple and easy-to-use thought, or outline, processor. For readers not familiar with this type of word processor, a thought processor organizes your thoughts into a coherent outline. They're particularly useful in writing assignments, such as reports in business and terms papers in English courses, even for writing letters.

First type in each thought as a simple sentence, followed by a blank line. Then use the block-move feature to arrange your sentences in the appropriate order. Now you have an organized outline to work from. It's that easy!

—DITTO AND E.T. BJORNSEN, HILLSBORO, NH

### SEARCH AND DESTROY?

When using your word processor's search-and-replace option, take care to replace only what you really want. You could, for example, use the letters US throughout a document for United States and later replace the abbreviation with the complete spelling. However, some word processors will find both upper- and lowercase versions. So it's possible you might replace "must" with "mUnited Stated". To prevent this, use an unusual combination, such as u!s or u\*s. This should ensure that you do not destroy any text you don't want to replace.

—JEREMY A. MICHELE, BIG TIMBER, MT

### RUN SCRIPT 128 MAGIC

I'd like to share two undocumented features of RUN Script 128 with other readers.

To toggle in and out of Insert mode, press the tab key instead of using the CTRL/I combination.

The short file below prints both the return address and the destination address on a small envelope. To print on a business envelope, change the sixth line to .el8.1+45.

```
.cm "env address"
.lm3.tml.+30
Your name
Your address
Your city state zip
.el6.1+30
.cm mailing address
RUN Magic
80 Elm St.
Peterborough, NH 03458
```

To enter a new destination address, position the cursor on the first line and press F8 twice to clear to the end. Then enter the new address and print the next envelope.

—JOHN D. CLARK, LUTHERVILLE, MD

## 19. SEASONAL

### CHRISTMAS MAGIC

Season's Greetings! The holiday season is again upon us, and in keeping with the spirit of Christmas, here's a little Yuletide magic. Type in the program, place your monitor ▶



## MAGIC

on the fireplace mantle or in the bay window, and settle back in your favorite recliner with a hot toddy to watch the action!

```

1 REM CHRISTMAS MAGIC - RICHARD PENN
5 POKE53280, .:POKE53281, .:PRINT"{SHFT CLR}"
  :FORT=1TO23:PRINTTAB(RND(1)*39)"{CTRL 1}.
  ":NEXT
10 AS="*****":S=19:PRINT"{HOME}{CRSR
  DN}"TAB(12)"{CTRL 2}MERRY CHRISTMAS!{CRS
  R DN}"{CTRL 6}":FORT=1TO11STEP2
20 FORL=1TO3:PRINTTAB(S)LEFT$(AS,T):NEXT:S=
  S-1:NEXT:PRINTTAB(19)"*{CRSR DN}{CRSR LF
  }*{CRSR DN}{3 CRSR LFS}*****"
30 S=:DIMF(138):FORT=1024TO2023:IFPEEK(T)=
  42ORPEEK(T)=46THENF(S)=T+54272:S=S+1
40 NEXT:S=139:T=15:L=1
50 POKEF(S*RND(L)),T*RND(L)+L:GOTO50

```

—RICHARD PENN, MONTREAL, QUEBEC, CANADA

### HERE COMES THE BRIDE

This program is dedicated to all you romantic people out there. After the program ends, press any key to exit Graphic mode.

```

10 REM WEDDING RING -JASON HANRAHAN
20 GRAPHIC 1,1,24:COLOR0,1:COLOR4,1:COLOR1
  ,8
30 FOR X=196 TO 208:CIRCLE 1,X,125,35,57:
  NEXT
40 DRAW 1,200,68 TO 208,68 TO 200,58 TO 19
  6,68 TO 200,68
50 DRAW 1,208,68 TO 216,48 TO 200,58
60 DRAW 1,208,68 TO 224,45 TO 216,48
70 DRAW 1,196,68 TO 188,48 TO 204,58
80 DRAW 1,196,68 TO 176,45 TO 188,48
90 DRAW 1,176,45 TO 192,40 TO 188,48 TO 21
  6,48
100 DRAW 1,192,40 TO 202,48 TO 212,40 TO21
  6,48
110 DRAW 1,192,40 TO 212,40
120 DRAW 1,212,40 TO 224,45
130 GETKEY AS:GRAPHIC0

```

—JASON HANRAHAN, WHITETAIL, MT

### WHITE CHRISTMAS

This program plays a C-64 version of Irving Berlin's White Christmas and simultaneously produces a screen display that simulates falling snow.

```

10 REM WHITE CHRISTMAS-J.R.CHARNETSKI
20 POKE53280,5:POKE53281,0:PRINT"{SHFT CLR
  }{CTRL 2}"
30 S=54272:FORI=STOS+23:POKEI,0:NEXT
40 POKES+24,15:POKES+5,9:POKES+6,9:FORJ=1T
  O68:READHF,DU:CS=CS+HF+DU:POKES+1,HF
50 POKES+4,17:FORE=0TO28*(DU+1)
60 IFD=XTHENPRINT"{HOME}{CRSR DN}";SPC(RND
  (1)*38+1);".{HOME}{CRSR DN}{CRSR LF}"CH
  R$(148):POKE218,156:X=X+10
70 NEXT:POKES+4,16:X=0:NEXT:POKES+24,0
80 IFCS<>6422THENPRINT"DATA ERROR":END
90 PRINT"{SHFT CLR}MERRY CHRISTMAS!!!"
100 DATA 84,3,89,,84,,79,,84,,89,3,94,
110 DATA 100,3,112,,126,,134,,150,,134,

```

```

120 DATA 126,,112,,100,5,67,,75,,84,1
130 DATA 84,1,84,,112,1,100,67,1,67,1
140 DATA 67,,100,1,89,,84,2,84,,89,,84,
150 DATA 75,,67,,75,5,84,3,89,,84,,79,
160 DATA 84,,89,3,94,,100,2,112,,126,
170 DATA 134,,150,,134,,126,,112,,100
180 DATA 5,67,,75,,84,1,84,1,84,,112,1
190 DATA 100,,134,5,67,,75,,84,1,84,1
200 DATA 112,,63,,63,1,63,,67,5

```

—JOSEPH R. CHARNETSKI, DALLAS, PA

### JINGLE BELLS

My program plays a lively C-64 version of this song by J. S. Pierpont.

```

1 REM C-64 JINGLE BELLS-J.R.CHARNETSKI
2 AS="GGGGGGGO>BGIIIIIGGGGBBBOGGGGGGGO>BG
  IIIIGGGOOIB>6GB>666GB>99IGB<OOIBG6G"
3 BS="B>666GB>99IGB0000UOIB>OGGGGGGO>BGII
  IIGGGGBBBOGGGGGGGO>BGIIIIIGGGOOIB>"
4 CS="BDBDBBCCAHHBCABBCABBBDBDBDBDBBCCA
  HBCABBCABBBBHHBBBGBABBBBHHBBBHHBBB"
5 DS="BBGABBBBHHBBBHCABBBBDBDBDBBCCAHHB
  CABBCABBBBDBDBDBBCCAHHBCABBCABBBH"
6 AS=AS+BS:DS=CS+DS:W=54272:FORI=WTOW+23:P
  OKEI,0:NEXT:POKEW+5,9:POKEW+24,15
7 FORI=1TO144:POKEW+1,ASC(MID$(AS,I,1))-29
  :POKEW+4,33
8 FORJ=1TO100*(ASC(MID$(DS,I,1))-64):NEXT:
  POKEW+4,32:NEXT:POKEW+24,0

```

—JOSEPH R. CHARNETSKI, DALLAS, PA

## 20. MISCELLANEOUS

### PRINTER SPACE

If you need more desk space around your printer, place a low-cost letter tray upside down and set the printer atop it. Store the fanfold paper underneath the letter tray—you've just found yourself almost 100 square inches of desk space.

—MICHAEL LENOSKI, TUCSON, AZ

### EASY-ACCESS DIP SWITCHES

When I use my Card? +G interface with my software, I frequently need to change the positions of interface switches 7 and 8 on the circuit board, and the board has to be removed each time to make the change.

I solved this annoying problem by soldering flexible wires to these switches on the bottom of the circuit board and bringing them out to miniature SPST switches mounted in a small box outside the interface. I also mounted another SPST switch to control power from the cassette port to the interface.

Now, when I load a program and find that one or both switches need to be changed, I just change the SPST switches. Be sure you turn the SPST power switch off before flipping the other switches, and then on again afterwards.

—F. C. HORN, JEKYLL ISLAND, GA ■



# C O M M O D O R E SERVICE CENTERS

*In the following pages, you'll find the latest official list of Commodore Service Centers. They are all arranged alphabetically by state, and alphabetically by city within each state. Bring any errors or omissions to our attention by calling RUN editorial, free, at 800-441-4403.*

## ALABAMA

**Command Computers**  
5334 Oporto Madrid  
Birmingham, AL 35206  
205-591-3150

**T.C. Electronics**  
207 Loehmanns Village  
Birmingham, AL 35244  
205-988-0003

**Sequential Systems, Inc.**  
1420 Glenn St. SW  
Decatur, AL 35603  
205-355-9273

**Video, Etc.**  
5 Boll Weevil Plaza, 84 Bypass  
Enterprise, AL 36331  
205-393-4138

**T.C. Electronics**  
Highway 36W PO Box 1129  
Hartselle, AL 35640  
205-773-1077

**Abax Data Systems**  
2806B S. Memorial Parkway  
Huntsville, AL 35801  
205-536-7292

**Radio & Computer Services**  
Route 7, Box 71  
Mobile, AL 36608  
205-645-0807

**Mall Tel Communications**  
3264 Springdale Plaza  
Mobile, AL 36606  
205-473-2750

**Mel's Photo & Computer**  
546 E. Patton Ave.  
Montgomery, AL 36111  
205-288-6220

**Winter Electronics**  
420 15th St.  
Tuscaloosa, AL 35401  
205-752-7176

## ALASKA

**Matrax, Inc.**  
3605 Arctic, #510  
Anchorage, AK 99503  
907-563-5794

**Computer Depot & Electronics**  
State Route 5292Z  
Wasilla, AK 99687  
907-373-2525

## ARIZONA

**Datasystems**  
115 W. Birch  
Flagstaff, AZ 86001  
602-774-0307

**A2D Electronix**  
5119 W. Thunder Bird Rd.  
Glendale, AZ 85306  
602-978-5314

**Strauch's Stationers**  
12 W. Main St.  
Mesa, AZ 85201  
602-834-4686

**Copperstate Cash Register**  
3125 E. McDowell Rd.  
Phoenix, AZ 85008  
602-244-9391

**Computer Horizons, Inc.**  
4609 N. 12th St.  
Phoenix, AZ 85014  
602-230-1888

**Computer West**  
4130 N. 75th Ave., #105  
Phoenix, AZ 85033  
602-849-4795

**Phoenix Shaver & Electronics Center**  
1808 N. Central Ave.  
Phoenix, AZ 85004  
602-258-4180

**Entech (Dynacor, Inc.)**  
4401 S. 36th St.  
Phoenix, AZ 85040  
602-445-7646

**J & M Computer Service**  
Highway 89 N. Granite Dells  
Prescott, AZ 86313  
602-445-7646

**Shav-tronics**  
5110 S. Rural Rd.  
Tempe, AZ 85285  
602-838-4306

**DJ's Electronics**  
5441 E. Pima St.  
Tucson, AZ 85712  
602-326-6174

## ARKANSAS

**Dugger's Custom Printing**  
203 S. Main St. PO Box 351  
Bald Knob, AR 72010  
501-724-6439

**JJ's Television & Electronics**  
2007 Southwest A St.  
Bentonville, AR 72712  
501-273-5880

**SIS, Inc.**  
2201 Washington Ave.  
Conway, AR 72032  
501-327-1375

**Micro Tronix**  
1614 Towson Ave.  
Fort Smith, AR 72901  
501-782-4048

**Cheshire (Xerox Co.)**  
1 Centennial Drive  
Hot Springs, AR 71913  
501-767-0248

**The 64 Store, Inc.**  
2621 E. Nettleton  
Jonesboro, AR 72401  
501-935-8622

**Micro Shop, Inc.**  
8023 Chicot Rd.  
Little Rock, AR 72209  
501-568-8023

**Datafix, Inc.**  
5101 W. 65th St.  
Little Rock, AR 72209  
501-562-3554

**Computer Mart, Inc.**  
860 Highway 62 E., Suite 6  
Mountain Home, AR 72653  
501-425-6321

**Vidcom Center**  
936 State Line Ave.  
Texarkana, AR 75502  
501-772-6277

## CALIFORNIA

**Albany Microcomputer Service**  
1494 Solano Ave., Suite 4  
Albany, CA 94706  
415-527-9619

**Commodore Land**  
2894 W. Valley Blvd.  
Alhambra, CA 91803  
818-282-1114

**Transnational Electronics**  
1130A N. Kraemer Blvd.  
Anaheim, CA 92806  
714-630-8711

**American Micro Repair**  
225 S. State College  
Anaheim, CA 92806  
714-491-3886



## SERVICE CENTERS

### Pet Vet

1038 Middlefield Rd.  
Berkeley, CA 94708  
415-843-7168

### Omni Computer Services

1925 The Esplanade  
Chico, CA 95926  
916-893-3458

### Macomco

5843 Sheila St.  
Commerce, CA 90040  
213-722-0803

### Hi-Tech Computer Repair

1331 Meadow Lane  
Concord, CA 94520  
415-827-1555

### Integrated Controls

1240L Logan Ave.  
Costa Mesa, CA 92626  
714-641-0181

### On Line Computer Repair

3209 S. Brea Canyon Rd., Suite A  
Diamond Bar, CA 91765  
714-594-2641

### DES Computer Repair Co.

8315 Firestone Blvd.  
Downey, CA 90241  
213-923-9361

### Compcare Center

407 W. 9th Ave.  
Escondido, CA 92025  
619-480-4422

### Electronic Service Center

11069 Warner Fountain  
Valley, CA 92708  
714-775-2495

### Microcomputer Service Network

3849 Peralta Blvd., Suite A  
Fremont, CA 94536  
415-797-4724

### Hollywood Computers

1023 N. La Brea  
Hollywood, CA 90038  
213-851-2226

### Compufix Depot #2

6021 W. Warner Ave.  
Huntington Beach, CA 92647  
714-841-1355

### Cirvis, Inc.

5082 Bolsa Ave., Suite 112  
Huntington Beach, CA 92649  
714-891-2000

### Century Computer Systems

1040 E. Whittier Blvd.  
La Habra, CA 90631  
213-694-8426

### Electronix Extraordinaire

43019 Bloomingpark St.  
Lancaster, CA 93536  
805-943-8797

### Tad Electronics Service

44920 N. Beech Ave.  
Lancaster, CA 93534  
805-949-6056

### Delta Computers

104 N. School, Suite 218  
Lodi, CA 95240  
209-369-9081

### Computer Clinic

1500 E. Chestnut Court, Suite A  
Lompoc, CA 93436  
805-736-9727

### Sunrise Electronics, Inc.

10439 Los Alamitos Blvd.  
Los Alamitos, CA 90720  
213-598-9525

### SOS Computers

362 S. La Brea Ave.  
Los Angeles, CA 90036  
213-857-0371

### Certified Audio Service Center

2352 S. Robertson Blvd.  
Los Angeles, CA 90034  
213-856-8222

### Ken's Computer

25856 Muirland Blvd.  
Mission Viejo, CA 92691  
714-472-0965

### Star Computers

655 Morro Bay Blvd.  
Morro Bay, CA 93442  
805-772-7827

### Skyles Electric Works

231E S. Whisman Rd.  
Mountain View, CA 94041  
415-965-1735

### Computer-Video Depot

306 Maple St.  
Mount Shasta, CA 96067  
916-926-6273

### Price Place

1636 D. Ave.  
National City, CA 92050  
619-477-3106

### Calco Computers, Inc.

1723 Oceanside Blvd. S.  
Oceanside, CA 92054  
619-433-4119

### Associated Electronic Service

60 Sutter View  
Oroville, CA 95966  
916-534-3737

### Ternes Office Equipment

110 Liberty St.  
Petaluma, CA 94952  
707-762-3556

### User's Depot (Datatex, Inc.)

2356 San Pablo Ave.  
Pinole, CA 94564  
415-724-2067

### Golden West Systems

91 Laurel  
Porterville, CA 93257  
209-781-6700

### Second Source Engineering

2664B Merchantile Drive  
Rancho Cordova, CA 95670  
916-635-3725

### Vie's TV & Computer Service

1002 Placer St.  
Redding, CA 96001  
916-243-4531

### Brown Knows Computing, Inc.

147 Redlands Mall  
Redlands, CA 92373  
714-798-4937

### On Line Computer Repair

17738 1/2 Sherman Way  
Reseda, CA 91335  
818-705-5924

### Ridgecrest Computer Center

211 N. Balsam St.  
Ridgecrest, CA 93555  
619-375-4364

### User Friendly Outlet

9345 Douglas Drive  
Riverside, CA 92503  
714-788-4836

### Computer Support (Compulock)

75 Executive Way, #3  
Rohnert Park, CA 94928  
707-584-4040

### Software Stop

612 El Camino Real  
N. Salinas, CA 93907  
408-449-8800

### Bit Zero

1700 North E St., Suite 101  
San Bernardino, CA 92405  
714-883-6547

### Computer Nook, Inc.

965 South E St.  
San Bernardino, CA 92408  
714-381-3446

### Home Computing Centers, Inc.

115 Tanforan Park  
San Bruno, CA 94066  
415-478-8891

### CSB, Inc.

10225 Barnes Cyn Rd., Suite A102  
San Diego, CA 92121  
619-455-6114

### Computer Outlet

5861 Mission Gorge Rd.  
San Diego, CA 92120  
619-740-0113

### IBF Electronics

211 Hugo St.  
San Francisco, CA 94122  
415-665-0423

### Computer & Peripheral Repair

294 N. Capital Ave.  
San Jose, CA 95127  
408-272-4028

### Compucare

1817 4th St., #5  
San Rafael, CA 94901  
415-459-6461

### Sommer's Electronics

147 3rd St.  
San Rafael, CA 94901  
415-459-3135

### Learning Tree Computer Center

2431A N. Tustin Ave.  
Santa Ana, CA 92705  
714-667-1575

### M.V. Electronics

2116 S. Wright St.  
Santa Ana, CA 92705  
714-549-1848

### Eastside Electronics, Inc.

922 Soquel Ave.  
Santa Cruz, CA 95062  
408-423-6515

### Software First

1211A N. Dutton  
Santa Rosa, CA 95401  
707-576-0972

### Computer Room

230 Mt. Hermon, Suites 210/212  
Scotts Valley, CA 95066  
408-438-5061

### Technitronics

1830 Fremont Ave.  
South Pasadena, CA 91030  
818-441-0103

### Computer Support of CA

52 S. Linden Ave., Suite 1  
South San Francisco, CA 94080  
415-589-9800

### Precision Electronics

7610 Pacific Ave., B12  
Stockton, CA 95207  
209-957-5828

### HT Electronics

346 W. Maude Ave.  
Sunnyvale, CA 94086  
408-737-0900

### Computer Repair & Maintenance

1668 Callens Rd.  
Ventura, CA 93003  
805-656-2726

### Complications, Inc.

2678 N. Main St.  
Walnut Creek, CA 94596  
408-737-9277

### Dataphile

1504 Freedom Blvd.  
Watsonville, CA 95076  
408-744-3322

### Ramteck

14034 Lambert Rd.  
Whittier, CA 90605  
213-696-6250

### Thomas Technologies

22742 Ventura Blvd.  
Woodland Hills, CA 91364  
818-347-6003

### Micro Comtech, Inc.

23035 Ventura Blvd., Suite 101  
Woodland Hills, CA 91364  
818-704-4757

## COLORADO

### House of TV Repair, Inc.

2648 S. Parker Rd.  
Aurora, CO 80014  
303-696-7657

### Electronic Time of Colorado, Inc.

13172 E. Mississippi  
Aurora, CO 80012  
303-745-1188

### Computer City

6570 W. 120th Ave, C3  
Broomfield, CO 80020  
303-466-4000

### Paragon Software & Electronics

4331 N. Chestnut, Suite 18  
Colorado Springs, CO 80907  
303-548-8803

### Citadel Computers, Inc.

747 Citadel Drive  
E. Colorado Springs, CO 80909  
303-591-1700

### DMA Digital Computer System

515 S. Tejon St.  
Colorado Springs, CO 80903  
303-475-2490

### Danin Electronics

1619 W. Colorado Ave.  
Colorado Springs, CO 80904  
303-633-0459

### Computer Hospital

1604 E. 17th Ave.  
Denver, CO 80218  
303-321-6221



## SERVICE CENTERS

**AB & K Services, Inc.**  
1459 S. Pearl St.  
Denver, CO 80210  
303-777-4408

**Micro Doctor**  
1655 Central St.  
Denver, CO 80211  
303-458-6713

**Colorado Showpiece**  
2839 Hartford Ave.  
Grand Junction, CO 81503  
303-245-6082

**Electronic Service Center of Greeley**  
1228 8th Ave.  
Greeley, CO 80631  
303-353-5252

**Micro World Electronix**  
3333 S. Wadsworth Blvd.  
Lakewood, CO 80227  
303-987-9531

**Advanced Computer Service**  
1531 N. Lincoln Ave.  
Loveland, CO 80537  
303-663-0172

**Hytech Service Center**  
3706 W. 72nd Ave.  
Westminster, CO 80030  
303-427-5561

### CONNECTICUT

**Video Connection**  
45 Ronal Drive  
Berlin, CT 06037  
800-624-6555

**Chetlens Serve-A-Set**  
2615 Fairfield Ave.  
Bridgeport, CT 06605  
203-335-2893

**Computer Development Systems**  
63 North St.  
Bristol, CT 06010  
203-583-5993

**Multi Business Computer Systems**  
136 Berlin Rd.  
Cromwell, CT 06416  
203-635-3568

**JRB Enterprises, Inc.**  
31 Main St.  
Danielson, CT 06239  
203-774-0291

**Software Kingdom, Inc.**  
838 Silver Lane  
East Hartford, CT 06118  
203-627-8180

**New Haven Appliance**  
1627 Dixwell Ave.  
Hamden, CT 06514  
203-288-6229

**JRB Enterprises, Inc.**  
Route 12, Box 365C  
Lisbon, CT 06351  
203-376-0553

**Terry's Electronic Service**  
111 Quinpiac Ave.  
North Haven, CT 06473  
203-787-1128

**Tricom Computers**  
Route 6, Airport Plaza  
North Windham, CT 06256  
203-456-8535

**Academy Electronic & Sound Systems**  
812 W. Thames St.  
Norwich, CT 06360  
203-887-0595

**Personal Computer Center**  
16 Franklin St.  
Norwich, CT 06360  
203-886-2073

**Petzold's Electronics, Inc.**  
255 Bank St.  
Seymour, CT 06483  
203-888-0170

**Computer Doctor**  
816 E. Main St.  
Stamford, CT 06902  
203-348-9826

**Computer Outlet**  
Plaza 83, Route 83  
Vernon, CT 06066  
203-872-2667

**Electronic Service Corp.**  
501 Post Rd.  
E. Westport, CT 06880  
203-227-7291

### DELAWARE

**Products Plus, Inc.**  
377 W. N St.  
Dover, DE 19901  
302-734-1519

**AMS Service Center**  
1 Lore Ave.  
Wilmington, DE 19809  
302-764-7768

### DISTRICT OF COLUMBIA

**Computer Clinic Center, Inc.**  
4517 Wisconsin Ave. NW  
Washington, DC 20016  
202-362-9702

### FLORIDA

**Computer Base of Brandon**  
222 Oakfield Drive  
Brandon, FL 33511  
813-681-9020

**Harrison Communication**  
603 Brenda Drive  
Brandon, FL 33511  
813-685-3375

**M.S.I. Business Systems**  
416 W. Broad St.  
Brooksville, FL 33512  
904-799-7700

**Latham's TV**  
Route 2, Box 345A  
Crestview, FL 32536  
904-682-1001

**Data Base**  
8962 State Rd. 84  
Davie, FL 33324  
305-474-3355

**National Business Machines**  
231 S. Florida Ave.  
Deland, FL 32721  
904-736-1122

**Glidden Electronics, Inc.**  
1548 N. Woodland Blvd.  
Deland, FL 32720  
904-724-9278

**Newton's Radio & TV**  
2201 NE 2nd Ave.  
Delray Beach, FL 33444  
305-278-1414

**Bytes Computer Service, Inc.**  
3733 NW 16th St.  
Fort Lauderdale, FL 33311  
305-791-6678

**Brocato Computer Care**  
13663 McGregor Village, #17  
Fort Myers, FL 33907  
813-482-6077

**Random Access Computers**  
298 N. Elgin Parkway  
Fort Walton Beach, FL 32548  
904-862-7763

**Florida Book Store**  
1614 W. University Ave.  
Gainesville, FL 32604  
904-376-5606

**Compu-A-Shoppe**  
1103 N. Main St.  
Gainesville, FL 32601  
904-375-0339

**A.L.A. Computer Lab**  
808 Tarpon Terrace  
Harbor Heights, FL 33950  
813-625-0574

**A1 Computer Service Center**  
2019 Harrison St.  
Hollywood, FL 33020  
305-923-5115

**AA Computers**  
9394 Arlington Expressway  
Jacksonville, FL 32211  
904-724-7499

**AA Computers**  
6001-55 Argyle Forest Blvd.  
Jacksonville, FL 32244  
904-771-2437

**AA Computer Exchange**  
2726 Park St.  
Jacksonville, FL 32205  
904-388-6520

**Computer City**  
303 Margaret St.  
Key West, FL 33040  
305-294-3538

**Mobile Home Computer Repair**  
918 Park Ave., D  
Lake Park, FL 33403  
305-842-6313

**Electronic City**  
233 Interlake Blvd.  
Lake Placid, FL 33852  
813-465-4372

**Harris Systems**  
4130 10th Ave. N.  
Lake Worth, FL 33461  
305-967-9222

**SOS Computer**  
13850 Walsingham Rd.  
Largo, FL 33544  
813-581-3040

**Microcomputer Center**  
2980D E. Bay Drive  
Largo, FL 33541  
813-531-2614

**Lloyd Electronics**  
Highway 59, Interstate 10  
Lloyd, FL 32337  
904-997-4070

**AA Computer Center, Inc.**  
370 N. Highway 17-92  
Longwood, FL 32750  
305-331-1200

**Pro-Tech Services**  
1620 E. 9th St.  
Lynn Haven, FL 32444  
904-265-4334

**Computer Specialties**  
7705 Technology Drive  
Melbourne, FL 32940  
305-725-6574

**Computer Image**  
10055 Sunset Drive  
Miami, FL 33173  
305-477-9019

**Latta TV & Video, Inc.**  
11347 S. Dixie Highway  
Miami, FL 33156  
305-235-1771

**Creative Equipment**  
6864 W. Flagler St.  
Miami, FL 33144  
305-261-7866

**New Age Technologies, Inc.**  
32218 U.S. Highway 441, Suite 1  
Mount Dora, FL 32757  
904-383-3882

**Miami Appliance**  
18755 W. Dixie Highway  
North Miami Beach, FL 33180  
305-931-6066

**Cross Country Computer, Inc.**  
Westwood Square  
830 Eyrice Drive  
Oviedo, FL 32765  
305-365-1176

**Gulf Coast Computer Electronics, Inc.**  
674 W. 23rd St.  
Panama City, FL 32405  
904-763-1202

**Pensacola Computer Repair**  
44 Flynn Drive  
Pensacola, FL 32507  
904-453-5572

**Computer Bar**  
3300 N. Pace Blvd.  
Pensacola, FL 32505  
904-438-4118

**Advanced Video Tech, Inc.**  
1310 S. Dixie Highway, Suite 18W  
Pompano Beach, FL 33060  
305-785-2490

**Computer Trends**  
6806 Ridge Rd.  
Port Richey, FL 33568  
813-847-4914

**Force Technologies, Inc.**  
1587 S. Niemyer Circle  
Port St. Lucie, FL 33452  
305-337-0333

**Office World**  
1242 Whitfield Ave.  
Sarasota, FL 34243  
813-753-6779

**Computers Plus**  
(Soft Byte Solutions Corp.)  
2355C S. Ridgewood Ave.  
South Daytona, FL 32019  
904-756-2983

**New Age Electronics**  
2311 28th St. N.  
St. Petersburg, FL 33713  
813-323-8389

**Computer Supply Mart**  
2810 Scherer Drive, Suite 100  
St. Petersburg, FL 33702  
813-576-1070

**Education Computers, Etc.**  
1651 N. Monroe St.  
Tallahassee, FL 32303  
904-681-0786



## SERVICE CENTERS

**Computer Corner**  
1511B E. Fowler Ave.  
Tampa, FL 33612  
813-977-1280

**Computer Base Enterprises**  
3643 S. Westshore Blvd.  
Tampa, FL 33629  
813-831-4763

**Technical Services National, Inc.**  
4010 State St.  
Tampa, FL 33609  
813-872-5625

**Computer Repair Service, Inc.**  
2199 Garden St.  
Titusville, FL 32796  
305-267-4655

**Authorized TV Service, Inc.**  
605 6th St. SE  
Winter Haven, FL 33880  
813-294-1522

### GEORGIA

**Athens Microcomputers Clinic**  
2173 W. Broad St.  
Athens, GA 30606  
404-549-0337

**The 64 Store (A & S Software)**  
2969C Cobb Parkway  
Atlanta, GA 30339  
404-952-6625

**Computer Shoppe, Inc.**  
4015 Washington Rd.  
Augusta, GA 30907  
404-868-8911

**Computer Systems, Inc.**  
1801 Wynnton Rd.  
Columbus, GA 31906  
404-324-7000

**Lanier Electronics, Inc.**  
115 Merchant Square  
Cumming, GA 30130  
404-889-3858

**Cardinal Computers**  
903 N. Glenwood Ave.  
Dalton, GA 30720  
404-226-0502

**Acom Corp.**  
3042 Oakcliff Rd.  
Doraville, GA 30340  
404-451-8455

**Ampex Systems**  
6433 Warren Drive  
Norcross, GA 30093  
404-263-9190

**Harris TV**  
1 E. Montgomery Cross Rd.  
Savannah, GA 31406  
912-927-2084

**Computer Command**  
2910B N. Ashley St.  
Valdosta, GA 31602  
912-244-2108

**B & W Enterprises**  
1931 Memorial Drive  
Waycross, GA 31501  
912-285-7286

### HAWAII

**J & C Repair**  
98-027 Hekaha Building 3, Unit 11  
Aiea, HI 96701  
808-488-4994

**Computer Store, Inc.**  
291 Keawe St.  
Hilo, HI 96720  
808-969-1166

**Logical Data Systems, Inc.**  
333 Ward Ave.  
Honolulu, HI 96814  
808-526-1196

**Servco Pacific, Inc.**  
2850B Pukoloa St.  
Honolulu, HI 96819  
808-834-7627

**Otsuka Sales & Service, Ltd.**  
1624 Kuhio Highway  
Kapaa, HI 96746  
808-822-7766

**Kauai Electronics, Inc.**  
4259 Halenani St.  
Lihue, HI 96766  
808-245-6413

### IDAHO

**Technicom Service Center**  
2309 Mt. View Drive, Suite 175  
Boise, ID 83706  
208-375-0282

**ABI Video**  
1732 W. State St.  
Boise, ID 83702  
208-465-7515

**Digital Doohickeys, Inc.**  
1725 W. Broadway St.  
Idaho Falls, ID 83402  
208-529-5830

### ILLINOIS

**Digital World, Inc.**  
711 Army Trail Rd.  
Addison, IL 60101  
312-628-9222

**Call-Tech, Inc.**  
505 W. Golf Rd.  
Arlington Heights, IL 60005  
312-956-7135

**Rex Service Co.**  
1125 S. Arlington Heights Rd.  
Arlington Heights, IL 60005  
312-952-1661

**Modern Management Consultants**  
620 W. Park  
Aurora, IL 60506  
312-892-9898

**B-A Business Computers**  
150 Houston St., Suite 308  
Batavia, IL 60510  
312-879-2350

**Kappel's Computers**  
125 E. Main  
Belleville, IL 62220  
618-277-2354

**In Service, Inc.**  
765 Route 83, Suite 114  
Bensenville, IL 60106  
312-860-9822

**Keepin' Pace Computers**  
1510 N. Neil St.  
Champaign, IL 61820  
217-356-1883

**Rex Service Co.**  
6011 S. Pulaski Rd.  
Chicago, IL 60629  
312-448-5558

**Rex Service Co.**  
6450 N. Milwaukee Ave.  
Chicago, IL 60631  
312-792-2575

**Ken's Electronics**  
12200 N. Brentfield Drive  
Dunlap, IL 61525  
309-243-9940

**Software or Systems**  
5900 N. Illinois  
Fairview Heights, IL 62208  
618-624-2211

**JFE Computers**  
RFD 2, Box 262  
Geneseo, IL 61254  
309-944-3412

**Rex Service Co.**  
18666 S. Dixie Highway  
Homewood, IL 60430  
618-799-7800

**Newingham's Office Equipment**  
110 S. State St.  
Jerseyville, IL 62052  
618-498-2646

**Ideal Computer Systems**  
101 S. Schuyler Ave.  
Kankakee, IL 60901  
815-935-8505

**Rex Service Co.**  
721 E. Roosevelt  
Lombard, IL 60148  
312-495-4545

**Dan's TV**  
6905 Elm Ave.  
Loves Park, IL 61111  
815-633-5579

**Computer Clinic**  
195 S. State St.  
Manhattan, IL 60442  
815-478-4995

**Service Network, Inc.**  
Lourdes Rd., RR 5  
Metamora, IL 61548  
309-383-4143

**Basic Software Shop, Inc.**  
4734 W. 147th St.  
Midlothian, IL 60445  
312-385-8435

**O'Rourke Brothers Distributors**  
1909 5th Ave.  
Moline, IL 61265  
309-762-7936

**Diversified Electronic Service**  
5915 Lincoln Ave.  
Morton Grove, IL 60053  
312-470-1600

**Memory Expansion**  
309 W. Beaufort, Suite 8  
Normal, IL 61761  
309-454-7110

**Davis Computer Services**  
448 N. Rocky Hollow  
Oregon, IL 61061  
815-732-7380

**Rex Service Co.**  
14600 S. LaGrange Rd.  
Orland Park, IL 60462  
312-349-8300

**Warren Radio Co.**  
800 SW Jefferson St.  
Peoria, IL 61605  
309-674-5998

**Ken's Electronics**  
1507 E. Mossville Rd., Route 4  
Peoria, IL 61615  
309-243-9940

**R/D Computer Sales & Service**  
1622 4th St.  
Peru, IL 61354  
815-223-0102

**Video Service**  
1312 N. 24th  
Quincy, IL 62301  
217-223-2323

**Sound Clinic & Video Lab**  
3840 Broadway  
Rockford, IL 61108  
815-398-0560

**KNW Radio & Television**  
1011 E. 162nd St.  
South Holland, IL 60473  
312-331-1214

**Beatty Televisual, Inc.**  
1287 Wabash Ave.  
Springfield, IL 62704  
217-787-4855

**Computer Tutor, Inc.**  
1410 S. MacArthur Blvd.  
Springfield, IL 62704  
217-789-7164

**Unique Computer Shop**  
1411 E. 4th St.  
Sterling, IL 61081  
815-625-5018

**Keyboard Studio**  
304 N. Maple, #203  
Urbana, IL 61801  
217-328-3975

**Illini TV**  
1403 E. Washington  
Urbana, IL 61801  
217-328-3600

**Software Plus Corp.**  
731 W. Dundee  
Wheeling, IL 60090  
312-520-1717

**Rex Software Co.**  
7030 W. 111th St.  
Worth, IL 60482  
312-448-5558

### INDIANA

**TSC Service Corp.**  
303 N. Curry Pike  
Bloomington, IN 47401  
812-334-0411

**Eastern International, Inc.**  
938 S. Morton St.  
Bloomington, IN 47401  
812-333-1784

**Dave's Computer World**  
107 W. 3rd St. PO Box 218  
Brookston, IN 47923  
317-563-3504

**Computer Works**  
910 S. Rangeline Rd.  
Carmel, IN 46032  
317-848-0123

**Delta I Computer Center**  
211 Broadway  
Chesterton, IN 46304  
219-926-4840



## SERVICE CENTERS

**Computer Exchange**  
105 N. Green River Rd.  
Evansville, IN 47715  
812-473-5020

**Bytrex, Inc.**  
5958 Stellhorn Rd.  
Fort Wayne, IN 46815  
219-485-7511

**Computer Corner**  
6720 E. State Blvd.  
Fort Wayne, IN 46815  
219-493-6505

**Miller Corp.**  
2004-2006 45th St.  
Highland, IN 46322  
219-924-2707

**Electronic Services**  
515 N. Jefferson St.  
Huntington, IN 46750  
219-356-2070

**IGM Corp. (Impair)**  
4812 E. Michigan St.  
Indianapolis, IN 46201  
317-783-6167

**AVC Corp.**  
2702 Applegate St.  
Indianapolis, IN 46203  
317-783-6167

**Micro Computers, Inc.**  
3350 N. High School Rd.  
Indianapolis, IN 46224  
317-291-8882

**American Consolidated Electronics**  
2802 Lafayette Rd.  
Indianapolis, IN 46222  
317-926-5337

**Spectrum Sound, Inc.**  
3533 W. 30th St.  
Indianapolis, IN 46222  
317-923-7868

**Bill Kellar Computer Service**  
9535 E. 24th St.  
Indianapolis, IN 46229  
317-897-2619

**Computer Center**  
417 Main St.  
Jasper, IN 47546  
812-634-1550

**Bob Hahn TV**  
1411 N. 14th St.  
Lafayette, IN 47904  
317-742-2064

**Von's Computers**  
318 W. State St.  
Lafayette, IN 47906  
317-743-4041

**Computer Corner**  
1044 N. Baldwin Ave.  
Marion, IN 46952  
317-662-7160

**Quality TV Service**  
39 N. St. Clair  
Martinsville, IN 46151  
317-342-4198

**Computer People, Inc.**  
900 Highway 212  
Michigan City, IN 46360  
219-879-8557

**Microworld, Inc.**  
108 E. Main St.  
North Manchester, IN 46962  
219-982-7219

**CBM Service Center**  
300 W. Lincoln Highway  
Schererville, IN 46375  
219-322-3004

**Michiana Business Machines**  
1117 Mishawaka Ave.  
South Bend, IN 46615  
219-287-2348

**Alpha Electronics**  
905 Portage Ave.  
South Bend, IN 46616  
219-234-6689

**Burkat Computer Center**  
3105 Mishawaka Ave.  
South Bend, IN 46615  
219-287-3344

### IOWA

**EMC**  
1630 State St., Suite 4  
Bettendorf, IA 52722  
319-359-7497

**Pratt Audio Visual & Video Corp.**  
200 3rd Ave. SW  
Cedar Rapids, IA 52404  
319-363-8144

**RJS Electronics, Inc.**  
704 S. 2nd St.  
Clinton, IA 52732  
319-242-7963

**Advanced Computer & Electronics**  
6538 University Blvd.  
Des Moines, IA 50311  
515-255-1506

**Gronert Computers, Ltd.**  
4505 Forest Ave.  
Des Moines, IA 50311  
515-255-0618

**Computer Doctors, Inc.**  
1476 Central Ave.  
Dubuque, IA 52001  
319-582-9331

**Micro Computer Applications**  
19 S. Center St.  
Marshalltown, IA 50158  
515-752-8845

**Channel One Video, Inc.**  
1138 E. 9th St.  
Muscatine, IA 52761  
319-263-4124

**Precise Bytes**  
4639 Lonetree Rd.  
Palo, IA 52324  
319-851-6231

**Executive Computer Systems**  
925 Pierce St.  
Sioux City, IA 51101  
712-277-8223

**Sky Shepard Software**  
RR 2, 318 Nevada St.  
St. Charles, IA 50240  
515-297-2289

### KANSAS

**Thoroughbred Computers**  
11 E. 6th Ave.  
Emporia, KS 66801  
316-342-0221

**Micro Media**  
621 E. 8th  
Hays, KS 67601  
913-628-6611

**Darrel's Electronics, Inc.**  
102 E. Santa Fe  
Holyrod, KS 67450  
913-252-3562

**Midwest Computer Systems**  
503 N. Washington  
Junction City, KS 66441  
913-238-1100

**Computype 1123A**  
Moro St.  
Manhattan, KS 66502  
913-537-1075

**Mid-Kansas Computer**  
204 W. 6th St.  
Newton, KS 67114  
316-283-0208

**Computer Connection**  
215 W. Cloud  
Salina, KS 67401  
913-825-2096

**Data Bank Corp.**  
6700 W. Central St., Suite 100  
Wichita, KS 67212  
316-942-0225

**Radio Shop, Inc.**  
1211 E. 1st St.  
Wichita, KS 67214  
316-265-1851

**TD Service, Inc.**  
2033 S. Seneca  
Wichita, KS 67213  
316-262-1610

### KENTUCKY

**Corbin Communications**  
Highway 25 E. Bypass  
Corbin, KY 40701  
606-523-0528

**Business Equipment Distributors**  
817 Mill St.  
Henderson, KY 42420  
502-827-9500

**Computer Dimensions, Inc.**  
171 W. Lowry Lane  
Lexington, KY 40503  
606-277-1458

**Factory Electronics**  
2422 Palumbo Drive  
Lexington, KY 40509  
606-269-7341

**Computer Store**  
3034 Bardstown Rd.  
Louisville, KY 40205  
502-456-5011

**Woidich Appliance Service**  
2221 Crittenden Drive  
Louisville, KY 40217  
502-637-8440

**Roddenjon Co.**  
3920 Dupont Square S.  
Louisville, KY 40207  
502-897-0561

**Acom Corp.**  
1305 Dunnett Lane  
Louisville, KY 40213  
502-368-6330

**Doc's Electronics Service Center**  
910 S. Main St.  
Nicholasville, KY 40356  
606-885-9761

**Software Alternative**  
Route 3, Box 346  
Pikeville, KY 41501  
606-432-3539

### LOUISIANA

**Personal Computers**  
1311 Peterman Drive  
Alexandria, LA 71301  
318-442-5123

**MicroSystems Development**  
11861 Coursey Blvd.  
Baton Rouge, LA 70816  
504-295-3555

**MISSCO**  
1835 Riverside St. N.  
Baton Rouge, LA 70802  
504-387-5131

**Software Solutions**  
7167 Florida Blvd.  
Baton Rouge, LA 70806  
504-928-2613

**BB Computer Service, Inc.**  
1316 Violet Ave  
Bossier City, LA 71112  
318-742-6538

**Burlet TV & Electronics**  
1529 Franklin St.  
Gretna, LA 70053  
504-362-5547

**Computer Clinic**  
108 Rena Drive  
Lafayette, LA 70503  
318-981-1177

**Computer Basics & Electronics**  
2112 Enterprise Blvd.  
Lake Charles, LA 70611  
318-439-6888

**Tele-Comp Computer Systems**  
1731 W. Sale Rd.  
Lake Charles, LA 70605  
318-478-0540

**Micro-Lab Electronics**  
5040 Westbank Expressway  
Marrero, LA 70072  
504-341-2885

**Modern Business Machines**  
4609 Fairfield St.  
Metairie, LA 70006  
504-885-5961

**Computer Library**  
322 Danny Park  
Metairie, LA 70002  
504-455-5330

**Image Computer Systems**  
1010 N. 18th St.  
Monroe, LA 71201  
318-325-8610

**Executec, Inc.**  
7720 Linwood Ave.  
Shreveport, LA 71106  
318-687-9113

**Smith's Repair Shop**  
Route 5, Box 10  
Slidell, LA 70460  
504-641-2358

### MAINE

**Valley Computers, Inc.**  
164 Turner St.  
Auburn, ME 04210  
207-784-1944

**Computer Barn, Inc.**  
Biscay Rd.  
Damariscotta, ME 04543  
207-563-5000



## SERVICE CENTERS

**Don's Electronic Repair**  
68 E. Main St.  
Fort Kent, ME 04743  
207-834-5742

**Ayer Electronics**  
RFD 1, Box 6  
New Sharon, ME 04955  
207-778-9828

**Rod's Consumer Products**  
6 Cottage Rd.  
South Portland, ME 04106  
207-767-2724

**Comstock Electronics**  
1160 Old Gilmore Rd.  
Starks, ME 04911  
207-696-3817

**Applied Computer Group, Inc.**  
208 College Ave.  
Waterville, ME 04901  
207-873-3317

### MARYLAND

**Compucats Computer Center**  
939I Beards Hill Rd.  
Aberdeen, MD 21001  
301-272-4195

**Panaservice, Inc.**  
516 S. Broadway  
Baltimore, MD 21231  
301-327-7220

**Logical Device Repair**  
8008 Liberty Rd.  
Baltimore, MD 21207  
301-922-0773

**Professional Micro**  
100 W. 22nd St.  
Baltimore, MD 21218  
301-366-0010

**Computer Tech Institute**  
2401A Cleanleigh Drive  
Baltimore, MD 21234  
301-668-2690

**Compudeo**  
5808 Allentown Way  
Camp Springs, MD 20748  
301-449-3131

**Compuvision**  
6656 E. Dobbins Rd.  
Columbia, MD 21045  
301-381-3390

**Computer Bar**  
224 Rock Willow Ave.  
Hagerstown, MD 21720  
301-791-1278

**Computerworld**  
2112 Philadelphia Ave.  
Ocean City, MD 21842  
301-289-4111

**Buried Treasure, Inc.**  
5536 Randolph Rd.  
Rockville, MD 20852  
301-770-6778

**Clockwork Computers, Inc.**  
4612 Holly Ridge Rd.  
Rockville, MD 20853  
301-924-5509

**RW Computers**  
160 Ritchie Highway  
Severna Park, MD 21146  
301-544-0727

**Baltimore Gas & Electric Co.**  
2034 Greenspring Drive  
Timonium, MD 21093  
301-561-2780

**Waldorf Computer**  
Charles County Plaza H  
Waldorf, MD 20601  
301-843-1005

**Advanced Computer Service**  
68 W. Main St.  
Westminster, MD 21157  
301-876-7576

### MASSACHUSETTS

**Com-Pair Computer Repair**  
70 Essex St.  
Andover, MA 01810  
617-475-7285

**D-Five Associates**  
19 Crosby Drive  
Bedford, MA 01730  
617-275-8892

**Computer Turnkey Systems**  
1135 N. Main St.  
Brockton, MA 02401  
617-588-2766

**Digital Rework, Inc.**  
133 1st St.  
Cambridge, MA 02141  
617-492-2432

**Electronics Associates, Inc.**  
4 Fletcher St.  
Chelmsford, MA 01824  
617-256-5588

**Commonwealth Computer Group**  
15 Benton Drive  
East Longmeadow, MA 01028  
413-525-7404

**ServiceWorld, Inc.**  
280 Irving St.  
Framingham, MA 01701  
617-872-8700

**Northern Electronics, Inc.**  
495 Worcester Rd.  
Framingham, MA 01701  
617-875-5507

**Validata**  
32 Mount Farms Mall  
Hadley, MA 01035  
413-586-7405

**Atlantic Systems Electronic**  
24 Rockland St.  
Hanover, MA 02339  
617-826-8760

**Digital Repair**  
47 Cameron Rd.  
North Falmouth, MA 02556  
617-563-2441

**Electronics Center**  
32 Pleasant St.  
Northampton, MA 01060  
413-586-2270

**Tycom, Inc.**  
503 East St.  
Pittsfield, MA 01201  
413-442-9771

**Berkshire Electronics**  
274A Wahconah  
Pittsfield, MA 01202  
413-499-0981

**Whalley Computer Associates**  
549 College Highway  
Southwick, MA 01077  
413-569-5931

**Computer Marketplace, Inc.**  
1777 Main St.  
Tewksbury, MA 01876  
617-851-5317

**Omnitek Computers International**  
1300 Main St.  
Tewksbury, MA 01876  
617-851-4580

**The Bit Bucket**  
1294 Washington St.  
West Newton, MA 02165  
617-964-3080

**DOX Computer Center**  
320 Main St.  
Williamstown, MA 01267  
413-458-4420

**Baystate Audio Visual & Appliances**  
1326 Main St.  
Worcester, MA 01603  
617-753-2995

### MICHIGAN

**Lenawee Computer**  
825 W. Beecher St.  
Adrian, MI 49221  
517-265-7872

**RACC Enterprises**  
8948 M-68  
Alanson, MI 49706  
616-548-5705

**Galaxy Computers, Inc.**  
7437 Rosedale  
Allen Park, MI 48101  
313-381-7717

**Saylor's Music Studio**  
10550 E. Cleveland Rd.  
Bannister, MI 48807  
517-862-4659

**Creative Computing, Ltd.**  
1013 N. Johnson St.  
Bay City, MI 48708  
517-892-8115

**Family Computer Center**  
3895 12-Mile Rd.  
Berkley, MI 48072  
313-543-0520

**O'Leary Computer Systems, Inc.**  
G4065 Fenton Rd.  
Burton, MI 48529  
313-235-0666

**National Computer Clinic**  
G3514 S. Saginaw Rd.  
Burton, MI 48529  
313-742-7100

**Canton Computer, Inc.**  
5906 Sheldon Rd.  
Canton, MI 48187  
313-459-4340

**Graham's TV & Furniture**  
417 McEwan St.  
Clare, MI 48617  
517-386-3429

**Edge Connector 124**  
N. Mill  
Clio, MI 48420  
313-686-1070

**Electronics Center**  
1305 Woodside Ave.  
Essexville, MI 48732  
517-895-5915

**Alternate Computer Supply**  
17150 Robbins Rd., Box 289  
Grand Haven, MI 49417  
616-842-1891

**Repair America**  
1550 Lake Drive SE  
Grand Rapids, MI 49506  
616-456-8460

**Mill Creek Computer Service, Inc.**  
1000 Three Mile Rd., Suite D  
Grand Rapids, MI 49504  
616-784-9196

**Computerlab, Inc.**  
307 Michigan NE  
Grand Rapids, MI 49503  
616-451-3778

**Consolidated Enterprises**  
2715 Bedford Rd.  
Hastings, MI 49058  
616-945-5330

**ESL, Inc.**  
23309 Dequindre  
Hazel Park, MI 48030  
313-541-4080

**Repair America, Inc.**  
193 Chicago Drive  
Jenison, MI 49528  
616-457-4290

**Skory TV**  
4721 W. Saginaw  
Lansing, MI 48917  
517-323-7122

**Skory TV**  
901 Cleveland St.  
Lansing, MI 48906  
517-485-9551

**Direct Access Computers**  
2824 N. Grand River  
Lansing, MI 48906  
517-321-8958

**Computer Consignment**  
5501A S. Cedar St.  
Lansing, MI 48911  
517-394-4408

**Midwest Micro Computer Service**  
1575 Gray Rd.  
Lapeer, MI 48446  
313-664-5666

**Sterling Electronics, Inc.**  
1477 Dix  
Lincoln Park, MI 48146  
313-382-1111

**Micro Computer Services, Inc.**  
15084 Middlebelt Rd.  
Livonia, MI 48154  
313-427-0102

**AAA Electronic Service**  
28147 W. Eight Mile Rd.  
Livonia, MI 48152  
313-478-3048

**Slipped Disk**  
31044 John R. St.  
Madison Heights, MI 48071  
313-583-9803

**Lighthouse Computers**  
6740 S. River Rd.  
Marine City, MI 48039  
313-765-9656

**Electronics Plus**  
HCR 1, Box 32  
Menominee, MI 49858  
906-863-6164



## SERVICE CENTERS

**Computronix Corp.**  
423 S. Saginaw Rd.  
Midland, MI 48640  
313-631-8060

**Bits Computer Systems, Inc.**  
218 S. Main St.  
Milford, MI 48042  
313-684-1119

**KD Systems**  
667 Cooper Ave.  
Monroe, MI 48161  
313-241-0902

**Byte Intellect Co.**  
3054 E. Hile Rd.  
Muskegon, MI 49444  
616-777-3784

**Byte Intellect Co.**  
3284 Raffle Rd.  
Muskegon, MI 49444  
616-773-8869

**Computer Time**  
770 Penniman Ave.  
Plymouth, MI 48170  
313-453-2202

**Dell Service, Inc.**  
320 E. Centre  
Portage, MI 49081  
616-327-6736

**Phoenix Data Services, Inc.**  
1685 W. Hamlin Rd.  
Rochester, MI 48063  
313-852-1333

**L & D Radio & TV Service**  
25933 Gratiot Ave.  
Roseville, MI 48066  
313-776-8348

**Professional Computer Systems**  
2603 S. Cleveland Ave.  
St. Joseph, MI 49085  
616-429-9616

**Macomb County Radio Repair**  
33739 King Richard  
Sterling Heights, MI 48077  
313-978-0351

**Roseville Computer Store**  
15090 13 Mile Rd.  
Warren, MI 48093  
313-772-0760

**Ye Olde Computer Shoppe**  
516 W. Cross St.  
Ypsilanti, MI 48197  
313-482-6382

### MINNESOTA

**Midwest Computer Services**  
20841 Highway 75  
Clearwater, MN 55320  
612-558-2844

**Computers, Etc.**  
2133 Cliff Rd.  
Eagan, MN 55122  
612-452-1308

**MCD of Hibbing, Inc.**  
Mesabi Mall  
Hibbing, MN 55746  
218-262-5516

**H&H TV & Electronics**  
2625 Louisiana Ave. S.  
Minneapolis, MN 55426  
612-929-1721

**Computer Exercise World**  
4110 W. Minnetonka Blvd.  
Minneapolis, MN 55416  
612-920-7500

**West Central Computers**  
131 NW 2nd St.  
Ortonville, MN 56278  
612-839-6155

**Associated Data**  
5249 W. 134th St.  
Savage, MN 55378  
612-890-0273

**ECs, Inc.**  
8420 Sunset Rd. NE  
Spring Lake Park, MN 55432  
612-786-8940

**Valiant, Inc. (Computer Division)**  
224 Commercial  
Stillwater, MN 55082  
612-439-6743

### MISSISSIPPI

**Enterprises Unlimited, Inc.**  
2735 Old Brandon Rd.  
Jackson, MS 39208  
601-932-3920

**Central School Supply**  
310 Airport Rd.  
Pearl, MS 39208  
601-932-1901

### MISSOURI

**Mom & Pop's Computer Shop**  
RR 2, Box 119  
Cainsville, MO 64632  
816-872-6311

**Instant Replay, Ltd.**  
14416 S. Outer 40 Rd.  
Chesterfield, MO 63017  
314-576-0544

**Avant Service Center**  
711 Vandiver Drive  
Columbia, MO 65202  
314-874-3792

**Computer Systems Consultant**  
3620 Santiago Drive  
Florissant, MO 63033  
314-838-7701

**Electronic Data Associates**  
12400 Blue Ridge  
Grand View, MO 64030  
816-966-0669

**Systems Plus (Fidelity Television)**  
12500A E. 40 Highway  
Independence, MO 64055  
816-373-8984

**I Compute**  
3720 W. Truman Mall Ridge  
Jefferson City, MO 65101  
314-634-5028

**Software Center**  
804 E. 15th  
Joplin, MO 64801  
417-624-3844

**Hobbs Typewriter Co.**  
4500 E. 7th  
Joplin, MO 64801  
417-624-6322

**Kansas City Digital Systems**  
1503 Westport Rd.  
Kansas City, MO 64111  
816-561-7100

**Computer Plus**  
7186 Manchester Rd.  
Maplewood, MO 63143  
314-647-3817

**Lectroplex**  
2255 Brookview Lane  
Pacific, MO 63069  
314-257-5054

**Midwest Computers**  
2140 N. Westwood  
Poplar Bluff, MO 63901  
314-686-2292

**Associated Computer Service**  
1306 E. Sunshine St.  
Springfield, MO 65804  
417-887-7373

**Babcock Appliance**  
2608 1/2 Messanie St.  
St. Joseph, MO 64501  
816-233-2350

**Syntax Error, Inc.**  
2104 St. Joseph Ave.  
St. Joseph, MO 64505  
816-232-4778

**Systems Plus (Fidelity Television)**  
7435 Watson, 119 Kenrick Plaza  
St. Louis, MO 63119  
314-961-2323

**Data-Byte Computer Co.**  
9516 Lackland Rd.  
St. Louis, MO 63114  
314-423-3469

**Comm-Tech**  
3651 N. Lindberg, Suite 10  
St. Louis, MO 63074  
314-291-0114

**Alpha Tech Electronics**  
1411 S. Big Bend Blvd.  
St. Louis, MO 63117  
314-645-5250

### MONTANA

**RAM Electronics**  
13 S. Tracy  
Bozeman, MT 59715  
406-586-2408

**Computer Resource Center**  
16800 Mullan Rd.  
Frenchtown, MT 59834  
406-626-4707

**Applegren Computer Systems**  
1201 10th Ave. S., Suite 107  
Great Falls, MT 59405  
406-761-5076

**Second Byte, Inc.**  
2005 South Ave. W.  
Missoula, MT 59801  
406-721-6462

### NEBRASKA

**Micro Creations**  
4211 O St.  
Lincoln, NE 68510  
402-489-9454

**Double E Electronics, Inc.**  
12027 Pacific St.  
Omaha, NE 68154  
402-334-7870

**Cornerstone Business Systems**  
1408 Harney  
Omaha, NE 68102  
402-342-2611

### NEVADA

**Hotel Computers, Inc.**  
376 W. Sahara Ave.  
Las Vegas, NV 89102  
702-384-9440

**Computer World (ABC Investments)**  
4110 S. Maryland Parkway, #33  
Las Vegas, NV 89109  
702-796-1377

**Computer House 155**  
Glendale Ave.  
Sparks, NV 89431  
702-356-7216

### NEW HAMPSHIRE

**Electronic Repair Center**  
Route 16B  
Dover, NH 03820  
603-749-4707

**Cocci Computer Service, Inc.**  
1191 Daniel Webster Highway N.  
Manchester, NH 03104  
603-622-1188

**D.C. Audio and Video Service**  
882 Islington St.  
Portsmouth, NH 03801  
603-964-6318

### NEW JERSEY

**TKS, Inc.**  
391 Pompton Ave.  
Cedar Grove, NJ 07009  
201-239-2190

**Dependable Parts**  
168 Main St.  
Chatham, NJ 07928  
201-635-5922

**Golden Hedge, Inc.**  
1334 Brace Rd.  
Cherry Hill, NJ 08034  
609-772-0022

**2M Corp.**  
3 Astro Place  
Denville, NJ 07834  
201-625-8100

**Software Center**  
372 Highway 18  
East Brunswick, NJ 08816  
201-257-7778

**BBK, Inc.**  
105 Abbington Drive  
East Windsor, NJ 08520  
609-443-6196

**ACA TV & Electronics, Inc.**  
2076 Woodbridge Ave.  
Edison, NJ 08817  
201-985-7000

**SR Data**  
2141 Woodbridge Ave.  
Edison, NJ 08817  
201-985-5017

**Karl's Electronics**  
40 Darmstadt Ave. RR 3, Box 107  
Egg Harbor City, NJ 08215  
609-965-0319

**Computer Madness, Inc.**  
270D Route 9  
Englishtown, NJ 07726  
201-462-9696

**Family Computer Center**  
636 N. Route 46 E.  
Fairfield, NJ 07006  
201-678-0008



## SERVICE CENTERS

**Dash Electronics**  
10 N. 2nd. Ave.  
Highland Park, NJ 08904  
201-247-5124

**Micro-Aide**  
21401 Oak Tree Rd.  
Iselin, NJ 08830  
201-283-1914

**Telsar Electronics, Inc.**  
829 Stone Rd.  
Laurel Springs, NJ 08021  
609-783-8500

**Gimm Consultants**  
190 Route 73  
Maple Shade, NJ 08052  
609-667-6900

**DGL Computer Service Center**  
63 Woodside Ave.  
Midland Park, NJ 07432  
201-760-1849

**Atom Video & Electronics**  
100 Ryders Lane  
Milltown, NJ 08850  
201-745-2700

**ESU, Inc.**  
260 Washington  
Newark, NJ 07102  
201-676-1800

**Repair Tech, Inc.**  
185 Spring St.  
Newton, NJ 07860  
201-579-1068

**Computer & Software Store**  
507 9th St.  
Ocean City, NJ 08226  
609-391-0033

**AVECO**  
777 Route 17  
Paramus, NJ 07652  
201-652-9222

**Z-Tech Corp.**  
3495 Haddonfield Rd.  
Pennsauken, NJ 08110  
609-662-0330

**One Knight Only TV & Computer**  
1 Davis Ave.  
Pompton Plains, NJ 07444  
201-696-0976

**Video Connection**  
900 Easton Ave.  
Somerset, NJ 08873  
201-545-8733

**Business Micro Service, Inc.**  
Route 37 & Parkwood Ave.  
Toms River, NJ 08753  
201-929-1212

**Atlantic Computer Systems**  
Ideal Plaza, 224 Route 37 E.  
Toms River, NJ 08753  
201-240-3101

**Quality Electronics**  
254 Route 37 E.  
Toms River, NJ 08753  
201-244-2232

**Blue Chip Computer Repair**  
1751 Black Horse Pike  
Turnersville, NJ 08012  
609-728-9546

**Triton Scientific Corp.**  
2215 Morris Ave.  
Union, NJ 07083  
201-851-0851

**JRM Electronics, Inc.**  
Route 206, RR 10  
Vincentown, NJ 08088  
609-859-2106

**Jonach Electronics, Inc.**  
622 Route 10  
Whippany, NJ 07981  
201-428-9440

### NEW MEXICO

**Video Mart**  
1500 N. White Sands  
Alamogordo, NM 88310  
505-434-4548

**New Horizons Computer Systems**  
1200 N. White Sands  
Alamogordo, NM 88310  
505-437-9117

**Omega Business Products**  
3275 Candelaria NE  
Albuquerque, NM 87107  
505-883-4545

**Instrument Service Lab**  
680 Haines Ave. NW  
Albuquerque, NM 87102  
505-842-1107

**Technological Concepts**  
3700 Paradise Lane  
Las Cruces, NM 88005  
505-526-6029

### NEW YORK

**Albany Cash Register Co.**  
224 Central Ave.  
Albany, NY 12206  
518-434-6331

**Ski Electronics**  
13879 Allen Rd.  
Albion, NY 14411  
717-589-7711

**Computer Service Group**  
4005 Sheridan Drive  
Amherst, NY 14226  
716-839-1139

**Computersmith**  
14 Currie Court  
Ballston Spa, NY 12020  
518-885-4376

**Marty's Electronic Service Center**  
72 5th Ave.  
Bayshore, NY 11706  
516-665-5048

**Bob's Amp Repair**  
32 W. State St.  
Binghamton, NY 13901  
607-723-1057

**Computersoft Center, Inc.**  
175 E. Main St.  
Brewster, NY 10509  
914-279-5001

**Comp-U-Doc, Inc.**  
1722 Kings Highway  
Brooklyn, NY 11229  
718-645-1881

**Sysut 1 Corp.**  
2505 Avenue U  
Brooklyn, NY 11229  
718-743-8303

**HMR Television & Data**  
1949 Bath Ave.  
Brooklyn, NY 11214  
718-256-9880

**Interboro Electronics**  
4823 Avenue N  
Brooklyn, NY 11234  
718-252-1380

**Prime-Time Electronics, Inc.**  
7621 13th Ave.  
Brooklyn, NY 11228  
718-232-7770

**Dale Integrated Service**  
747 Clinton St.  
Buffalo, NY 14210  
716-845-6060

**Island Video & Computer Service**  
51 Modells Shopping Plaza  
Centereach, NY 11720  
516-467-4352

**Island Video & Computer Service**  
35 Middle Country Rd.  
Coram, NY 11727  
516-736-1001

**Computerware**  
2384 Hempstead Turnpike  
East Meadow, NY 11554  
516-731-7939

**Damonics Computer Systems**  
111 N. Main St.  
Elmira, NY 14901  
607-732-5122

**Electra Tech Audio Video**  
140-11A Cherry Ave.  
Flushing, NY 11355  
718-463-1192

**Expert Electronics Center**  
63-56 108th St.  
Forest Hills, NY 11375  
718-897-6101

**Software Center International**  
114-47 Queens Blvd.  
Forest Hills, NY 11375  
718-793-8112

**CDP Computer Specialties**  
182 Doris Ave.  
Franklin Square, NY 11010  
516-328-0419

**Roan Electronic**  
65-56 Fresh Meadow Lane  
Fresh Meadow, NY 11365  
718-461-1888

**Aardvark Electronic Service**  
44 Castle St.  
Geneva, NY 14456  
315-789-5295

**Ray Supply, Inc.**  
Upper Glen St., Box 745  
Glens Falls, NY 12801  
518-792-5848

**P & T Computer**  
74 Middle Neck Rd.  
Great Neck, NY 11021  
516-487-1130

**Island Video & Computer Service**  
719 E. Jericho Turnpike  
Huntington Station, NY 11746  
516-271-9060

**OHM Electronics, Inc.**  
609 W. Clinton St.  
Ithaca, NY 14850  
607-273-8406

**Computer Outlet**  
14 E. 2nd St.  
Jamestown, NY 14701  
716-487-0176

**Software Supermarket**  
3162 1/2 Delaware Ave.  
Kenmore, NY 14217  
716-873-5321

**Sight & Sound Service Center**  
603 Waterster Shaker Rd.  
Latham, NY 12110  
518-785-6004

**Latham Electronics & Appliances**  
7 Herbert Drive  
Latham, NY 12110  
518-785-5816

**Ray Supply, Inc.**  
106 E. Main St.  
Malone, NY 12953  
518-483-3241

**Mor Tech Computer Service**  
Route 49  
Marcy, NY 13403  
518-724-7964

**Star Tech Systems**  
7 Water St.  
Massena, NY 13662  
315-764-1560

**Systems Repair Co.**  
61 Maple Ave.  
New City, NY 10956  
914-634-7596

**Computer Doctor**  
64 Madison Ave.  
New York, NY 10016  
212-213-8440

**Central Ventures**  
42 E. 33rd St.  
New York, NY 10016  
212-686-0930

**TC Terminals, Inc.**  
45 West 27th St., 3rd Floor  
New York, NY 10001  
212-233-6356

**Blumenthal's**  
234 N. Union  
Olean, NY 14760  
716-375-4608

**Ray Supply, Inc.**  
439 Cornelia St.  
Plattsburg, NY 12901  
518-561-3870

**Dac Data Systems, Inc.**  
352 Port Washington Blvd.  
Port Washington, NY 11050  
516-944-5920

**Tedrow Business Products**  
1600 W. Ridge Rd.  
Rochester, NY 14615  
716-621-5981

**Leon's Computer Mart**  
103 Clinton Ave. S.  
Rochester, NY 14604  
716-325-2787

**Serviceland of Upstate NY**  
3259 Winton Rd. S.  
Rochester, NY 14623  
716-427-0880

**J & R Electronics**  
2181 Rome Oriskany Rd.  
Rome, NY 13440  
315-339-1242

**Video Computer Center**  
407 W. Liberty St.  
Rome, NY 13440  
315-336-0266



## SERVICE CENTERS

**Computer Palace**  
1245 Middle Country Rd.  
Selden, NY 11784  
516-331-7974

**Software City**  
1474 Hylan Blvd.  
Staten Island, NY 10305  
718-448-1424

**R & Z Service Corp.**  
40 Broadway  
Staten Island, NY 10310  
718-448-1424

**Working Computer**  
1320 Stony Brook Rd., Suite 9  
Stony Brook, NY 11790  
516-689-3102

**Computer Emporium**  
356 Windsor Highway  
Vails Gate, NY 12584  
914-562-3131

**Computer Service Associates**  
181B Route 94 N.  
Warwick, NY 10940  
914-986-0233

**Amherst Computer Exchange**  
5687 Main St.  
Williamsville, NY 14221  
716-626-5111

### NORTH CAROLINA

**Pegasus Electronics**  
104 S. Morehead Ave.  
Atlantic Beach, NC 28512  
919-726-1646

**PC Shop**  
1147 Commercial Ave.  
Charlotte, NC 28205  
704-373-0553

**Software City**  
901C N. Wendover Rd.  
Charlotte, NC 28211  
704-366-5218

**Southern Photo**  
**Technical Service, Inc.**  
2610 South Blvd.  
Charlotte, NC 28209  
704-523-0012

**TDS Computers**  
2710 Hillsborough Rd.  
Durham, NC 27705  
919-286-3775

**Computer Solutions**  
2725 Bragg Blvd.  
Fayetteville, NC 28303  
919-323-9600

**Triad Computers**  
3402E W. Wendover Ave.  
Greensboro, NC 27407  
919-299-0391

**RCM Electronics, Inc.**  
219 E. Main St., Suite 2  
Havelock, NC 28532  
919-447-4355

**Computer Alternatives**  
2035 Highway 64-70 SE  
Hickory, NC 28603  
704-324-2040

**C.A.S.P.E.R. Corp.**  
124 Harbord Drive  
Jacksonville, NC  
919-353-1223

**Computer Connection**  
1157 N. Wesleyan Blvd.  
Rocky Mount, NC 27804  
919-977-6566

**Musselwhite TV & Computer**  
1021 Princess St.  
Wilmington, NC 28401  
919-762-3329

**Triad Computers**  
3068 Trentwest Drive  
Winston-Salem, NC 27103  
919-765-0433

### NORTH DAKOTA

**Ultra Systems, Inc.**  
408 E. Bowen  
Bismark, ND 58501  
701-258-2546

**Digital Hospital Service Center**  
221 N. NP Ave.  
Fargo, ND 58102  
701-280-0067

**Computer Clinic**  
1100 S. Broadway  
Minot, ND 58701  
701-838-3967

### OHIO

**Lake's Consumer Electronics**  
3232 S. Main St.  
Akron, OH 44319  
216-644-3194

**Trans American Electronics**  
23 S. Broadway St.  
Akron, OH 44308  
216-384-1516

**Infopro**  
6 E. Main St.  
Ashland, OH 44805  
419-289-1122

**Dale's Color TV & Appliances**  
2236 N. Cleveland Mass Rd.  
Bath OH 44210  
216-659-9339

**R & M Electronics**  
5456 S. Market St.  
Berlin, OH 44610  
216-893-2773

**Comtech**  
1750 Southgate Parkway  
Cambridge, OH 43725  
614-432-4259

**Micro-Sys Computer**  
2521 NE 34th St.  
Canton, OH 44705  
216-492-8161

**Chillicothe Telephone**  
68 E. Main St.  
Chillicothe, OH 45601  
614-772-8238

**T.A.B. Service**  
506 Harrison Lane  
Cincinnati, OH 45244  
513-528-6983

**Alpha Cine Service, Inc.**  
800 Main St.  
Cincinnati, OH 45202  
513-621-4293

**Ohio Office Machines, Inc.**  
124 Burkhardt Ave.  
Cincinnati, OH 45215  
513-761-7121

**Cinsoft**  
2235 Losantiville Ave.  
Cincinnati, OH 45237  
513-396-7638

**Warner Electronics, Inc.**  
1240 Valley Belt Rd.  
Cleveland, OH 44131  
216-661-0304

**Bexley Electronics & TV, Inc.**  
2733 E. Main St.  
Columbus, OH 43209  
614-235-0698

**Earthrise Micro Systems**  
1332 Bethel Rd.  
Columbus, OH 43220  
614-451-1100

**Main Office Supply**  
504 Main St.  
Coshocton, OH 43812  
614-622-7115

**Professional Microcare, Inc.**  
730 S. Main St., Suite 103  
Dayton, OH 45402  
513-223-234

**Dayprom Computer**  
3035 Dryden Rd.  
Dayton, OH 45439  
513-299-1748

**RC Video**  
14887 E. Liverpool Rd.  
East Liverpool, OH 43920  
216-385-5672

**AAA Electronic Service Co.**  
53 East Ave.  
Elyria, OH 44035  
216-323-8383

**Fairborn Home Computer, Inc.**  
608 W. Middle St.  
Fairborn, OH 45324  
513-879-1681

**Microwave Magic & Computers**  
6625 Dixie Highway  
Fairfield, OH 45014  
513-874-6560

**Tri-Con Micro Repair, Inc.**  
562 Northland Blvd.  
Forest Park, OH 45240  
513-825-8200

**Compucash Business Supplies**  
13369 Madison Ave.  
Lakewood, OH 44107  
216-226-3120

**B & G Electronics**  
15729 Madison Ave.  
Lakewood, OH 44107  
216-521-2855

**Lancaster Computer Center**  
154 W. Main St.  
Lancaster, OH 43130  
614-654-7667

**Lima Computer & Electronics**  
2133 Elida Rd.  
Lima, OH 45805  
919-229-1009

**Home Electronic Tech**  
16 Eagle St.  
Madison, OH 44057  
216-428-6161

**First Computer & Software**  
284 Front St.  
Marietta, OH 45750  
614-373-9729

**Marion Computer Center, Inc.**  
474 N. Main St.  
Marion, OH 43302  
614-382-2881

**Buckeye Service Co.**  
610 Chestnut St.  
Marysville, OH 43040  
513-644-1625

**Computer Center at Mentor**  
7516 Mentor Ave.  
Mentor, OH 44060  
216-942-4132

**Wayne's TV Sales & Service**  
3309 Mogadore Rd.  
Mogadore, OH 44260  
216-628-2528

**Turner & Wilson, Inc.**  
214 W. National Drive  
Newark, OH 43055  
614-323-1313

**Basic Computer Systems**  
Unit 220, Eastwood Mall  
Niles, OH 44446  
216-652-0056

**Valley Micro Computer Sales**  
227 Youngstown Rd.  
Niles, OH 44446  
216-652-1477

**Spaceage Electronics, Inc.**  
2966 Barber Rd.  
Norton, OH 44203  
216-753-3054

**Big Bytes**  
1301 Boardman-Poland Rd.  
Poland, OH 44514  
216-758-0009

**George T. Saxton Associates**  
1717 E. Perkins Ave.  
Sandusky, OH 44870  
419-625-8093

**Digital Hardware Support**  
1631 Selma Rd.  
Springfield, OH 45505  
513-322-8570

**Computer Site**  
14763 Pearl Rd.  
Strongsville, OH 44136  
216-572-3580

**MSI Microtek, Inc.**  
8370 Dow Circle, Building B  
Strongsville, OH 44136  
216-234-8040

**Quality Computer Applications**  
555 S. Reynolds Rd.  
Toledo, OH 43615  
419-536-3646

**Walker's Electronic Services**  
1175 Waldo Way  
Twinsburg, OH 44087  
216-425-9040

**Computers Plus of Ohio**  
131 W. Wyandot Ave.  
Upper Sandusky, OH 43351  
419-294-5723

**North Coast Programming**  
35101 Euclid Ave.  
Willoughby, OH 44094  
216-953-1535



## SERVICE CENTERS

### OKLAHOMA

**Colonel Video**  
500D SE Washington Blvd.  
Bartlesville, OK 74006  
918-335-0026

**Video Computers, Inc.**  
1030 NW 38th St.  
Lawton, OK 73505  
405-335-9798

**Software Center**  
306 N. Main  
Miami, OK 74354  
918-542-6198

**Syntec Micro Systems**  
1108 W. Stovall Rd.  
Wilburton, OK 74578  
918-465-5675

### OREGON

**Pacific Electronics, Inc.**  
1225 E. Pacific Blvd.  
Albany, OR 97321  
503-928-4462

**Video & Software**  
8118 SW Hall Blvd.  
Beaverton, OR 97005  
503-224-2220

**Computer Service Center at Bend**  
841 NW Bond  
Bend, OR 97701  
503-382-7882

**Clackamas Computers**  
16140 SE 82nd Drive  
Clackamas, OR 97015  
503-650-0379

**Mr. Television, Inc.**  
780 Blair Blvd.  
Eugene, OR 97402  
503-485-4876

**Comm-Shack**  
3881 River Rd. N.  
Keizer, OR 97303  
503-393-5472

**Sunshine Computer**  
930 Summit Ave.  
Medford, OR 97501  
503-773-3608

**User's Corner**  
1133 S. Riverside, Suite 26  
Medford, OR 97501  
503-773-8868

**Russell & Associates**  
1020 Taylor Building, Suite 660  
Portland, OR 97205  
503-222-4860

**Computron Business Systems**  
1139 SW 11th Ave.  
Portland, OR 97205  
503-224-2220

**Electromatic, Inc.**  
6110 NE Union Ave.  
Portland, OR 97211  
503-282-7751

**Microcare, Inc.**  
1447 NE Sandy Blvd.  
Portland, OR 97232  
503-230-0770

**IB Computers**  
1519-21 SW Marlow  
Portland, OR 97225  
503-297-8425

**Marv's Video Express**  
812 W. Harvard Blvd.  
Roseburg, OR 97470  
503-672-4672

**Trace-1 Computer**  
2524 19th St. SE  
Salem, OR 97302  
503-364-9771

**Computer U.S.E.R.S.**  
650 Main St.  
Springfield, OR 97477  
503-726-8500

**Computron Business Systems**  
11705 SW Pacific Highway  
Tigard, OR 97223  
503-639-6780

### PENNSYLVANIA

**Alpha Omega Computer Co.**  
928 Broadhead Rd.  
Aliquippa, PA 15001  
412-375-4848

**Blair Office Equipment**  
1508 12th Ave.  
Altoona, PA 16601  
814-944-8485

**Digital Solutions, Inc.**  
1122 9th St.  
Altoona, PA 16601  
814-944-0405

**J.E. Foss Co., Inc.**  
3328B Industrial Blvd.  
Bethel Park, PA 15102  
412-831-7460

**Data Link, Inc.**  
608 Washington  
Bridgeville, PA 15017  
800-445-5465

**TRS**  
1016 Beaver St.  
Bristol, PA 19007  
215-788-0533

**Software Corner**  
316 N. Main St.  
Butler, PA 16001  
412-282-1773

**Energy Center**  
Bazaar Shopping Center, Store 417  
Clifton Heights, PA 19018  
215-623-3911

**North Central Digital Systems**  
800 Continental Blvd.  
Danville, PA 17821  
717-275-7713

**Downingtown Computer Center**  
719 E. Lancaster Ave.  
Downingtown, PA 19335  
215-269-3025

**Circle Computer Co.**  
1685 W. Main St.  
Ephrata, PA 17522  
717-733-7868

**Erie Computer Co.**  
2765 W. 8th St.  
Erie, PA 16505  
814-838-6386

**Parke T. Morrow, Inc.**  
627 W. 26th St.  
Erie, PA 16508  
814-455-7566

**GIT Computer Center**  
302 W. Otterman St.  
Greensburg, PA 15601  
412-838-1641

**Digital Doctor**  
Highland & White Streets  
Greensburg, PA 15601  
412-832-0140

**Basic Computer Systems**  
2481 E. State St.  
Hermitage, PA 16148  
412-342-5505

**Weniger Electronics, Inc.**  
645 Main St.  
Honesdale, PA 18431  
717-253-1110

**Triangle Computers**  
1721 Route 286 W.  
Indiana, PA 15701  
412-463-1300

**MVS Electronics**  
119 1st St.  
Irwin, PA 15642  
412-863-9436

**Siska's Computers**  
1715 Scalp Ave.  
Johnstown, PA 15904  
814-467-6827

**Gruss Electronic Repair**  
Hills Plaza  
Johnstown, PA 15904  
814-266-1395

**Main Street Software**  
172 Main St.  
Landisville, PA 17538  
717-898-2946

**A.C.H. Electronics**  
306 N. 1st St.  
Leighton, PA 18235  
215-377-4617

**Software Unlimited**  
934 Woodburne Rd.  
Levittown, PA 19056  
215-949-0400

**Leslie Dresbold, Inc.**  
Monroeville Mall  
Monroeville, PA 15146  
412-371-6575

**Peripherals Computer & Supply**  
2457 Perkiomen Ave.  
Mount Penn, PA 19606  
215-779-0522

**Business Computer Products**  
3318 Wilmington Rd.  
New Castle, PA 16105  
412-654-2999

**Computer Corner**  
Routes 63 & 309  
North Wales, PA 19454  
215-643-5030

**Intech**  
183 W. Lancaster Ave.  
Paoli, PA 19301  
215-647-5104

**Software Hut, Inc.**  
2534 S. Broad St.  
Philadelphia, PA 19145  
215-462-2268

**Appliance & Electronics**  
2010 Levick St.  
Philadelphia, PA 19149  
215-288-4700

**Top-Tech International, Inc.**  
2344 Perot St.  
Philadelphia, PA 19130  
215-236-9901

**Leslie Dresbold, Inc.**  
604 Liberty Ave.  
Pittsburgh, PA 15222  
412-281-8320

**Leslie Dresbold, Inc.**  
2138 Murray Ave.  
Pittsburgh, PA 15217  
412-421-2445

**Leslie Dresbold, Inc.**  
925 Main St.  
Pittsburgh, PA 15215  
412-781-1308

**Leslie Dresbold, Inc.**  
S. Hills Village Shopping Center  
Pittsburgh, PA 15241  
412-563-0330

**Leslie Dresbold, Inc.**  
Parkway Center Mall  
Pittsburgh, PA 15220  
412-928-8318

**Leslie Dresbold, Inc.**  
3613 Forbes Ave.  
Pittsburgh, PA 15213  
412-6881-0990

**Pittsburgh Computer Store**  
47 Clairton Blvd.  
Pittsburgh, PA 15236  
412-655-8220

**Delta Electronic Appliance**  
Box 61  
Portersville, PA 16051  
412-368-3779

**AVJ Computers**  
High & Hanover Sts.  
Pottstown, PA 19464  
215-326-9920

**Appliances Unlimited, Inc.**  
E. Neversink Rd.  
Reading, PA 19606  
215-779-2000

**Computers & Games**  
3326B Plaza Drive  
Reading, PA 19605  
215-929-0540

**Bett TV & Video Service**  
306 Huntington Pike  
Rockledge, PA 19111  
215-663-0590

**Keystone Electronics**  
436 S. Main St.  
Shrewsbury, PA 17361  
717-235-5469

**Arnold's Electronic Systems**  
550A W. Street Rd.  
Warminster, PA 18974  
215-675-4227

**Alpha Omega EBE**  
100 Liberty St.  
Warren, PA 16365  
814-726-2300

**Leslie Dresbold, Inc.**  
Century III Mall West  
Mifflin, PA 15122  
412-653-7878

**Siska's Computer & Electronics**  
1246 Horn Rd.  
Windber, PA 15963  
814-467-6827



## SERVICE CENTERS

**Baker Computers**  
206 N. Sherman St.  
York, PA 17403  
717-854-9411

### PUERTO RICO

**Microcomputer Store of Puerto Rico**  
Repto Metropolitano  
Shopping Center  
Rio Piedras, PR 00921  
809-754-0670

### RHODE ISLAND

**BLC Sales & Service**  
881 Waterman Ave.  
East Providence, RI 02914  
401-434-3777

**International Computer Services, Inc.**  
165 Dyerville Ave.  
Johnston, RI 02919  
401-273-1001

**Micro Limits, Inc.**  
10 Cedar Swamp Rd.  
Smithfield, RI 02917  
401-231-3252

**Elwin TV & Appliance, Inc.**  
55 Electronic Drive  
Warwick, RI 02888  
401-467-9300

**Software Connection, Inc.**  
101 W. Natick Rd.  
Warwick, RI 02886  
401-738-3430

### SOUTH CAROLINA

**Protronics TV, Inc.**  
6995 Dorchester Rd.  
Charleston, SC 29418  
803-552-3960

**Software Haus, Inc.**  
7565 Rivers Ave.  
Charleston, SC 29418  
803-797-6860

**Clemson Electronics, Inc.**  
412 Highway 123  
Clemson, SC 29631  
803-654-2855

**Horizon II**  
3715 E. North St. Extension  
Greenville, SC 29615  
803-235-7922

**Lancaster Computer Center**  
1123B Bypass 9  
Lancaster, SC 29720  
803-285-1228

**Protronics TV, Inc.**  
1220 Highway 703  
Sea Island Center  
Mount Pleasant, SC 29464  
803-881-8309

**Electric Shop**  
Highway 76, Route 2, Box 176  
Newberry, SC 29108  
803-276-2713

**R.B.S. Electronics, Inc.**  
12A W. Lee Rd.  
Taylors, SC 29687  
803-244-3692

**Avcom International, Inc.**  
2224 Airport Blvd.  
West Columbia, SC 29169  
803-796-4396

### SOUTH DAKOTA

**DSB Computer Services**  
120 Main  
Aberdeen, SD 57401  
605-225-6804

**Norm's TV**  
201 E. 2nd St.  
Mitchell, SD 57301  
605-996-5655

**West River Audio Visual**  
1212 E. Oregon St.  
Rapid City, SD 57701  
605-348-3389

**Hi Tech Service, Inc.**  
409 Maple Ave.  
Rapid City, SD 57701  
605-341-4888

**Computer Business Center**  
1215 E. St. Patrick  
Rapid City, SD 57701  
605-342-2879

**Sodak Electronics**  
603 S. Mable Ave.  
Sioux Falls, SD 57103  
605-361-0632

**Ultra Systems, Inc.**  
1018 14th St. SE  
Watertown, SD 57201  
605-882-1555

### TENNESSEE

**Computer Systems & Supplies**  
907 Congress Parkway  
Athens, TN 37303  
615-745-1363

**Bristol Micro Technology**  
724 State St.  
Bristol, TN 37620  
615-968-1146

**Data International, Inc.**  
5236 Hixon Pike  
Chattanooga, TN 37343  
615-875-8540

**Supersafe Computers**  
2518 41A Bypass  
Clarksville, TN 37041  
615-552-0514

**Hi-Tech Electronic Services**  
322 Commerce St., Room 205  
Kingsport, TN 37660  
615-247-8406

**Advanced Electronics**  
1138 N. Broadway  
Knoxville, TN 37917  
615-673-0138

**Integrated Systems, Inc.**  
3639 New Getwell Rd., Suite 10  
Memphis, TN 38118  
901-365-2495

**Computer Hardware Service**  
1023 8th Ave. S  
Nashville, TN 37203  
615-244-0111

**Video Home Library**  
963 Oak Ridge Turnpike  
Oak Ridge, TN 37830  
615-482-3893

### TEXAS

**Computer Stop**  
4201R N. 1st St.  
Abilene, TX 79603  
915-677-9104

**CEM Corp.**  
Route 4, 108 N. Brooks  
Brazoria, TX 77422  
409-798-1208

**Vid Com**  
2370-6 N. Expressway  
Sunrise Mall  
Brownsville, TX 78521  
512-544-6441

**Interotechnology, Inc.**  
48 N. Park Plaza  
Brownsville, TX 78521  
512-544-1612

**Compu-Care Tech Service**  
1904A Spid  
Corpus Christi, TX 78416  
512-852-5477

**Action Computer Repair**  
11407 Emerald St., Suite 109  
Dallas, TX 75229  
214-484-7838

**Regency Educational Systems, Inc.**  
4951 Airport Parkway, Suite 600  
Dallas, TX 75248  
214-934-3030

**Larson's Computer Service**  
4010 Joseph Hardin, Suite 280  
Dallas, TX 75236  
214-337-4876

**El Dorado Computer Center**  
7301 Boeing Drive, Suite E  
El Paso, TX 79925  
915-772-0880

**Software Terminals**  
3014 Alta Mere Drive  
Fort Worth, TX 76116  
817-244-4150

**Your Personal Computer Store**  
2724-6 61st St.  
Galveston, TX 77551  
409-740-3220

**Kwik Fix Electronics**  
906 S. Ann Blvd.  
Harker Heights, TX 76543  
817-690-3010

**Sabel Electronics**  
5700 Hillcroft St.  
Houston, TX 77036  
713-953-9955

**Electro Comp Services, Inc.**  
1802 Crockett St.  
Houston, TX 77007  
713-869-5887

**ALMA Engineering Services**  
723 W. Mount Houston Rd.  
Houston, TX 77038  
713-999-4443

**Colonel Video (Videorama)**  
2425 Bay Area Blvd.  
Houston, TX 77058  
713-486-5288

**Vidicomp Distributors, Inc.**  
1430 FM 1960 Rd. W.  
Houston, TX 77090  
713-444-6415

**Roy's Hobbies & Electronics**  
217 E. Kleberg  
Kingsville, TX 78363  
512-592-3149

**Brazosport Computer Co.**  
201B This Way  
Lake Jackson, TX 77566  
409-297-9695

**International Computer Sales  
& Service**  
2820 San Bernardo, #3  
Laredo, TX 78040  
512-726-4235

**Computer Time**  
3500 McCann Rd.  
Longview, TX 75601  
214-753-5761

**Southwest Computer Centre**  
5603 N. Highway 35, Suite 1  
Laredo, TX 78041  
512-724-1133

**Accounting Systems Computers**  
6701 Aberdeen, #9  
Lubbock, TX 79424  
806-794-1655

**Raven Comtech Electronics**  
2533 Franklin Drive, Suite 2B  
Mesquite, TX 75150  
214-285-1552

**Abacus Computers, Inc.**  
4370 W. Illinois Ave.  
Midland, TX 79703  
915-689-0744

**Sertec**  
302 W. Shaw Ave.  
Pasadena, TX 77506  
713-473-1406

**Personal Computer Systems**  
4749 Twin City Highway  
Port Arthur, TX 77642  
409-963-3003

**Micro Computer Repair**  
105B N. McKinney St.  
Richardson, TX 75081  
214-644-3770

**Micromend Corp.**  
2116 E. Arapaho, #359  
Richardson, TX 75081  
214-437-0970

**Computer Hardware Service**  
43H White Chapel  
Roanoke, TX 76262  
817-481-5445

**AB Computer Electronics Center**  
1732 N. Mays St.  
Round Rock, TX 78664  
512-244-2090

**Computer Store**  
3000 W. Harris Ave.  
San Angelo, TX 76901  
915-942-7505

**San Antonio Systems, Inc.**  
4245 Centergate St.  
San Antonio, TX 78217  
512-654-1631

**Computer Experience**  
5525 Blanco Rd., Suite 114  
San Antonio, TX 78216  
512-340-2901

**J & M Electronics, Inc.**  
4766 Research Drive  
San Antonio, TX 78240  
512-699-0404



## SERVICE CENTERS

**Tarplay Radio & TV, Inc.**  
1108 W. Adams  
Temple, TX 76501  
817-773-5928

**All Makes Computer Service**  
Route 8, Box 324-9  
Highway 155 S.  
Tyler, TX 75703  
214-581-5537

**Electronic Repair Station**  
2523 E. 5th St.  
Tyler, TX 75701  
214-592-8348

**Jolly's C-B Sales**  
1313 Sam Houston Drive  
Victoria, TX 77901  
512-578-2755

**Computer Hospital**  
325 Cotton Drive, Suite C  
Waco, TX 76710  
817-772-4611

**Electronic System**  
Route 10, Box 247H  
Waco, TX 76708  
817-836-4670

### UTAH

**Ready Business Machines**  
420 N. Main  
Clearfield, UT 84015  
801-773-4834

**United Service & Computer**  
790 S. Main St.  
Logan, UT 84321  
801-753-3709

**Computerwise Computers**  
55 N. Main St.  
Logan, UT 84321  
801-752-2500

**Certified Careers Institute**  
411 W. 7200 S, Suite 100  
Midvale, UT 84047  
801-562-9035

**Computers Plus**  
5630 S. Redwood Rd.  
Murray, UT 84123  
801-968-3901

**DSI Computer Repair**  
1664 Washington Blvd.  
Ogden, UT 84404  
801-627-2321

**DSI Computer Repair**  
1814 S. Columbus Lane  
Orem, UT 84058  
801-225-3044

**Computer Hospital**  
625 N. State St.  
Orem, UT 84057  
801-226-1616

**Integrated Computer Systems**  
2255 N. University Parkway 39  
Provo, UT 84604  
801-373-2901

**DSI Computer Repair**  
163 N. Main  
Richfield, UT 84701  
801-896-6716

**DSI Computer Repair**  
2951 S. State St.  
Salt Lake City, UT 84115  
801-484-4374

**Wasatch Electronics**  
2724 S. 3600 W, Suite L  
Salt Lake City, UT 84119  
801-964-9622

**Armadillo Brothers**  
3330 S. State St.  
Salt Lake City, UT 84115  
801-484-2791

### VERMONT

**Computeam, Inc.**  
205 Dorset St.  
South Burlington, VT 05403  
802-862-2802

**Ray Supply, Inc.**  
150 Dorset St.  
South Burlington, VT 05403  
802-658-9375

**Tutt Enterprises**  
RF 2, Box 123, Melody Lane  
Springfield, VT 05156  
802-674-5684

### VIRGINIA

**J.C. Services**  
4815A Eisenhower Ave.  
Alexandria, VA 22304  
703-461-0860

**STS Video Supply**  
14506B Lee Rd.  
Chantilly, VA 22021  
703-631-4949

**Willoughby Electronics**  
923 Preston Ave.  
Charlottesville, VA 22901  
804-977-5002

**Maurice TV & Electronics**  
4000 E. Indian River Rd.  
Chesapeake, VA 23325  
804-420-1642

**Comtron, Inc.**  
820G Live Oak Drive  
Chesapeake, VA 23320  
804-424-3400

**Computer Repair Technologies**  
2812D Merrilee Drive  
Fairfax, VA 22031  
703-849-8558

**Better Business Machines**  
1632 Lafayette Blvd.  
Fredericksburg, VA 22401  
703-371-5545

**B & K Technical Service**  
602 E. Nine Mile Rd.  
Highland Springs, VA 23075  
804-737-5180

**Action Electronics**  
Route 1, Box 6, Highway 16S  
Marion, VA 24354  
703-784-6054

**Systems Hardware Support**  
1493 Chain Bridge Rd., Suite 100  
McLean, VA 22101  
703-821-1505

**Viewtronics Service**  
7923 Chesapeake Blvd.  
Norfolk, VA 23518  
804-588-3366

**Computer Works**  
314 Exchange  
Petersburg, VA 23803  
804-861-1010 or 733-1010

**Appliance & Electronics, Inc.**  
4011 W. Broad St.  
Richmond, VA 23230  
804-353-5508

**Software City (Davisoft)**  
9944 Midlothian Turnpike  
Richmond, VA 23235  
804-320-2244

**Commercial Business Systems**  
504 Research Rd.  
Richmond, VA 23236  
804-379-0783

**J & D Electronics**  
1113 W. Church Rd.  
Sterling, VA 22170  
703-450-4237

**Computer Service Specialist**  
105B S. Witchduck Rd.  
Virginia Beach, VA 23462  
804-473-0400

**Micro Marketing**  
5312 E. Virginia Beach Blvd.  
Virginia Beach, VA 23462  
804-490-8384

**L & Y Electronics**  
13644C Jefferson Davis Highway  
Woodbridge, VA 22191  
703-494-3444

**Virginia Micro Systems, Inc.**  
13646 Jefferson Davis Highway  
Woodbridge, VA 22191  
703-491-6502

### WASHINGTON

**Bellingham Computer**  
2300 James St., Suite 1E  
Bellingham, WA 98225  
206-647-0086

**Superior Software**  
1290 N. Moore Rd.  
Camano, WA 98292  
206-629-4852

**Digital Test Systems**  
602 W. Main  
Centralia, WA 98531  
206-736-2628

**Com-Soft**  
9502 19th Ave. SE  
Everett, WA 98204  
206-338-0934

**Butler's TV & Computer Service**  
28717 Pacific Highway S  
Federal Way, WA 98003  
206-941-9096

**Harbor Electronic Communications**  
2614 Simpson Ave.  
Hoquiam, WA 98550  
206-532-3474

**Take-A-Byte, Inc.**  
815 W. Columbia Drive  
Kennewick, WA 99336  
509-582-3311

**OC Plus Electronics**  
8130 W. Innaha Ave.  
Kennewick, WA 99336  
509-735-7746

**Tech Star**  
7036 S. 188th St.  
Kent, WA 98032  
206-251-9040

**Cosygn, Inc.**  
19219 W. Valley Highway  
Kent, WA 98032  
206-251-5070

**Erik's Place**  
12455 116th Ave. NE  
Kirkland, WA 98034  
206-823-8088

**Martha Lake Electronics**  
16521 13th Ave. W  
Lynnwood, WA 98037  
206-743-4178

**Family Computer**  
3333 184th St. SW, Suite W  
Lynnwood, WA 98037  
206-775-3530

**Isletech**  
9027 90th NW, #4  
Oak Harbor, WA 98277  
206-675-7526

**Discount Computer Software**  
641 SW 152nd St.  
Seattle, WA 98166  
206-431-0180

**Accurate Data Service**  
1414 N. Fiske St., Suite D  
Spokane, WA 99202  
509-535-0590

**Bits, Bytes & Nibbles**  
450 Northtown Mall  
Spokane, WA 99207  
509-487-1601

**Computers Plus, Inc.**  
10310 S. Tacoma Way  
Tacoma, WA 98499  
206-581-5151

**TS Electronics**  
15101 Union Ave. SW  
Tacoma, WA 98498  
206-588-1510

**CT Compu-Teck**  
2713 6th Ave.  
Tacoma, WA 98406  
206-383-6346

**Tumwater Video**  
5109 Capitol Blvd.  
Tumwater, WA 98501  
206-352-9503

**Ramtronix**  
4221 NE St. Johns Rd., Unit C  
Vancouver, WA 98661  
206-699-4500

**Northwest Video**  
1226 N. Wenatchee Ave.  
Wenatchee, WA 98801  
509-662-8356

### WEST VIRGINIA

**Computers Plus**  
2077 Charleston Town Center  
Charleston, WV 25389  
304-342-4848

**Business Computer Service**  
1210 Smith St.  
Charleston, WV 25301  
304-343-9471

**Today's Computer Business Center**  
214 Capitol St.  
Charleston, WV 25301  
304-345-5566



## SERVICE CENTERS

**Lectronix Computer Service, Inc.**  
4810 W. Pea Ridge Rd.  
Huntington, WV 25705  
304-736-8035

**J.S. Latta, Inc.**  
1502 4th Ave.  
Huntington, WV 25726  
304-523-9433

**Solid State Sales & Service**  
2645 Charles St.  
Wellsburg, WV 26070  
304-737-2467

**Stone Church Video**  
204 Kruger St.  
Wheeling, WV 26003  
304-242-6062

### WISCONSIN

**J & J Electronics at Appleton**  
2518 N. Richmond  
Appleton, WI 54911  
414-739-1610

**Microtek Systems**  
West 63, N. 124 Washington Ave.  
Echo Plaza Shopping Center  
Cedarburg, WI 53012  
414-377-0381

**Cash Controls Systems, Inc.**  
2104 Highway 12  
Eau Claire, WI 54701  
715-832-9922

**Wood's Electronics**  
3335 London Rd.  
Eau Claire, WI 54701  
715-832-7143

**Computer Fix**  
1300 Industrial Drive  
Fennimore, WI 53809  
608-822-3374

**Software Shoppe**  
344 S. Military Rd.  
Fond du Lac, WI 54935  
414-921-8448

**Tri Lake Service**  
Highway 67 & 3rd Ave.  
Fontana, WI 53125  
414-275-5788

**Authorized TV**  
810 9th St.  
Green Bay, WI 54304  
414-499-4215

**TMW Software of Green Bay**  
1270 Main St.  
Green Bay, WI 54302  
414-432-7638

**River City Software**  
115 S. 6th St.  
La Crosse, WI 54601  
608-782-5540

**American TV**  
2601 Whalen Lane  
Madison, WI 53713  
608-271-9300

**Active TV**  
4234 N. Teutonia Ave.  
Milwaukee, WI 53209  
414-444-0117

**Systech Electronics**  
9617 W. Greenfield Ave.  
Milwaukee, WI 53214  
414-475-7475

**Platteville Telephone Co.**  
135 N. Bonson St.  
Platteville, WI 53818  
608-348-3025

**Colortron Computers**  
2111 Lathrop Ave.  
Racine, WI 53405  
414-637-5884

**Computer Paradise & Video**  
4901 Washington Ave.  
Racine, WI 53406  
414-633-7003

**Mom's Computers**  
1332 Strongs Ave.  
Stevens Point, WI 54481  
715-344-3703

**System Forms**  
1260 W. Main St.  
Sun Prairie, WI 53590  
608-837-3277

**American TV & Appliances**  
W. 229, N. 1400 Westwood Drive  
Waukesha, WI 53186  
414-549-3440

**North American Computer**  
150 South St.  
Waukesha, WI 53186  
414-547-6222

**Larson Electric**  
511 S. Main St.  
Waupaca, WI 54981  
715-258-3910

**TMW Software**  
207 Scott St.  
Wausau, WI 54401  
715-848-2164

**Comtech Industries Corp.**  
2446 8th St. S  
Wisconsin Rapids, WI 54494  
715-424-4169

### WYOMING

**Western States Marketing**  
1122 Logan Ave.  
Cheyenne, WY 82001  
307-632-0770

**Harvey & Associates, Inc.**  
1409 Mill St.  
Laramie, WY 82070  
307-745-7077

**Compu-Tecks**  
2712 Commercial Way  
Rock Springs, WY 82901  
307-362-4811 ■

# FOOTBALL • BASKETBALL • BASEBALL

**SPORTS FANS...THE SPORTS SIMULATIONS YOU HAVE BEEN WAITING FOR ARE HERE!**

## 3 IN 1 FOOTBALL

- with Stats Compiler for each player and team
- you choose from 14 offensive plays and 6 defensive formations
- includes 180 college teams, the 28 NFL teams and 12 '74 WFL teams from the '86 season PLUS 174 great college and 189 great pro teams of the past

**NEW!**  
**3-POINT SHOT**

## FINAL FOUR COLLEGE BASKETBALL & BASKETBALL: THE PRO GAME

- each player contributes as they did in real life
- Stats Compiler
- you determine starting lineup, substitutions, shot selection, passing, offensive and defensive styles of play and more
- the College game includes 292 teams from the '86-'87 season plus 70 all-time greats
- the Pro game features the 23 NBA teams from '86-'87 and more than 125 great teams of the past

## FULL COUNT BASEBALL

- Includes all 26 teams from the most recent and 52 great National and American League teams from the past
- 29 man rosters
- Ball park effects
- Stats Compiler automatically keeps all player and team stats as well as past schedule results.
- Complete boxscore to screen and/or printer after each game.
- One player vs. computer manager, two-player, and auto-play options.
- Input your own teams, draft or trade players from teams already included.
- You choose the starting lineups, batting order, relief pitchers, plus game decisions like when to hit away, bunt for a hit, sacrifice, steal, hit & run, bring in the corners or the entire infield, take an extra base, DH option and more!

*OTHER PAST SEASONS' TEAMS DISKS AVAILABLE AND NEW SEASONS' READY PRIOR TO PLAYOFFS FOR ALL GAMES.*

## CHECK YOUR LOCAL DEALER

OR

Send check or money order for **\$39.99** each. Visa and MasterCard accepted on phone orders only.  
Please add \$2.00 for postage and handling.

**LANCE HAFFNER GAMES**

P.O. Box 100594 • Nashville, TN • 37210 • 615/242-2617

**DEALER INQUIRIES WELCOME**



# HOW TO TYPE RUN LISTINGS

To simplify typing *RUN's* C-64 and C-128 program listings, we include checksum numbers. These follow a REM statement at the end of each line (e.g., :REM\*123) and necessitate your using *RUN's* Perfect Typist programs, listed below.

Type in 64 Perfect Typist (Listing 1) for 64 programs, or 128 Perfect Typist (Listing 2) for 128-mode programs, 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. Jot down the two SYS numbers that appear on your screen. 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*. After you press the return key to log in each line, a 1-, 2- or 3-digit number will appear below the line at the left margin. This is the checksum number, ranging from 0 to 255.

If this matches the checksum printed in the listing after the :REM\*, you have typed that line correctly. Then type the next program line over the previous line's checksum value. If the checksum numbers do not agree, analyze the line on screen for errors or omissions. Make the needed changes and press the return key again to log them in. A new checksum 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 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, but before attempting to run it, turn the 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. To do so, reload and run the Perfect Typist program, then load the program you were working on, list it, and continue from 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. Follow instructions inside curly brackets. For example, {SHIFT L} means 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. **R**

## Listing 1. 64 Perfect Typist program.

```

1 REM 64 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
10 POKE56,PEEK(56)-1:POKE52,PEEK(56):CLR
20 PG=PEEK(56):ML=PG*256+60
30 FORX=ML TO ML+154:READD:T=T+D:POKEX,D:N
EXT
40 IFT<>16251 THEN PRINT"ERROR IN DATA..."
:END
60 POKEML+4,PG:POKEML+10,PG:POKE ML+16,PG
70 POKE ML+20,PG:POKE ML+32,PG:POKE ML+38,
PG
80 POKE ML+141,PG
89 PRINT"{SHFT CLR}{CRSR RT}*****
*****"
90 SYS ML:PRINT "{CRSR RT}* 64 PERFECT TY
PIST IS NOW ACTIVE{2 SPACES}*"
100 PRINT "{CRSR RT}* SYS"ML"=ON{5 SPACES
}SYS"ML+30"=OFF **"
101 PRINT"{CRSR RT}*****
*****":NEW

```

```

110 DATA 173,005,003,201,003,208,001,096
120 DATA 141,105,003,173,004,003,141,104
130 DATA 003,162,103,160,003,142,004,003
140 DATA 140,005,003,096,234,234,173,104
150 DATA 003,141,004,003,173,105,003,141
160 DATA 005,003,096,032,124,165,132,011
170 DATA 162,000,142,240,003,142,241,003
180 DATA 189,000,002,240,051,201,032,208
190 DATA 004,164,212,240,040,201,034,208
200 DATA 008,072,165,212,073,001,133,212
210 DATA 104,072,238,241,003,173,241,003
220 DATA 041,007,168,104,024,072,024,104
230 DATA 016,001,056,042,136,016,246,109
240 DATA 240,003,141,240,003,232,208,200
250 DATA 173,240,003,024,101,020,024,101
260 DATA 021,141,240,003,169,042,032,210
270 DATA 255,169,000,174,240,003,032,205
280 DATA 189,162,003,189,211,003,032,210
290 DATA 255,202,016,247,164,011,096,145
300 DATA 013,032,032

```

## Listing 2. 128 Perfect Typist program.

```

1 REM 40/80 COL C128 PERFECT TYPIST
2 REM BY: JAMES E BORDEN
10 FORX=5120TO5379:READD:T=T+D:POKEX,D
20 NEXT:IFT<>28312 THENPRINT"{2 CRSR DNS}E
RROR IN DATA...":END
25 A$="":IFPEEK(215) THENA$="{20 SPACES}"
30 PRINT"{SHFT CLR}"A$ "*****
*****"
40 PRINTA$ " * 128 PERFECT TYPIST IS NOW A
CTIVE *"
50 PRINTA$ " **{2 SPACES}SYS 5120=ON{7 SPAC
Es}SYS 5150=OFF{2 SPACES}*"
60 PRINTA$ "*****
*****":SYS5120:NEW
70 DATA 173,5,3,201,20,208,1,96,141,45,20,
173,4,3,141,44,20,162,43,160,20
80 DATA 142,4,3,140,5,3,96,234,234,173,44,
20,141,4,3,173,45,20,141,5,3,96
90 DATA 32,13,67,140,255,19,162,0,142,252,
19,142,253,19,142,254,19,189,0,2
100 DATA 201,32,240,8,201,48,144,7,201,58,

```

```

176,3,232,208,238,189,0,2,240,54
110 DATA 201,32,208,5,172,254,19,240,42,20
1,34,208,10,72,173,254,19,73,1
120 DATA 141,254,19,104,72,238,253,19,173,
253,19,41,7,168,104,24,72,24,104
130 DATA 16,1,56,42,136,16,246,109,252,19,
141,252,19,232,208,197,173,252
140 DATA 19,24,101,22,24,101,23,141,252,19
,169,42,32,241,20,32,188,20,160
150 DATA 2,185,185,20,32,241,20,136,16,247
,165,116,208,9,165,117,208,5,169
160 DATA 145,32,241,20,172,255,19,96,13,32
,32,162,0,173,252,19,232,56,233
170 DATA 100,176,250,105,100,202,240,3,32,
232,20,201,10,176,5,205,252,19
180 DATA 240,15,162,0,232,56,233,10,16,250
,24,105,10,202,32,232,20,170,72
190 DATA 138,9,48,32,241,20,104,96,170,173
,0,255,72,169,0,141,0,255,138,32
200 DATA 210,255,104,141,0,255,96

```



# RUN CLASS ADS



**C64 PHOTOS**  
**NEAR-VIDEO QUALITY!**  
**— NON-VIDEO PRICES —**  
**PAGE-SIZE SHRINKS TO**  
**—STAMP & LABEL SIZE**  
**\*1-7 BITS HIGH/WIDE\***  
**9" SASE 4 INFO-PLEASE**  
**KALTEK—R2**  
**ADJUNTAS, PR 00601**

## FOR CHILDREN AND THE VISUALLY IMPAIRED

Quadruple size characters for your 64/128

KIDSWORD™: A full function word processor simple enough for children and powerful enough for adults.  
 MOUNT MURDOCH: An exciting adventure game that also lets you write your own adventures.  
 KIDSVIEW™: Write and run your own programs in large, clear characters. Works also with Muppet Learning Keys(™).



\$39.95 each plus \$3.00 s + h per order. Choice of standard print or large print manual.

KIDSVIEW SOFTWARE Inc., PO Box 98, Warner, NH 03278  
 VISA/MasterCard (603) 927-4428

SKYLAB PUBLISHING CO. PRESENTS

### MODEM FUN 1

**MODEM GAMES**  
 TELE-TAG ..... Arcade  
 PHONPOLE ..... Monopoli  
**UTILITIES**  
 PHONMAN ..... Hack Term  
 1650 D/L ..... Dial/Load  
 DIALER ..... Find Comp  
 SEQ FILE ..... Printer  
**ARTICLES**  
 TID-BIT ..... Modm Help  
 BBS #'s ..... 200 + #'s



THE C-64 DISKS THAT MAKE THE WORLD A FUN PLACE TO COMPUTE!

MODEM FUN PRESENTS THE BEST ORIGINAL & PID PROGRAMS & ARTICLES FOR MODEM USE!  
 2 VALUE PACKED DISKS. ONLY \$10 EACH PPD.

SKYLAB, PO BOX 2031,  
 CLARKSBURG, WV 26302

### MODEM FUN 2

**MODEM GAMES**  
 ARENA ..... ADVENTURE  
 CHESS ..... GRAPHICS!  
**UTILITIES**  
 BBS SYS ..... Full BBS  
 BBS #'s ..... Over 600  
 SEQ FILE ..... Printer  
**ARTICLES**  
 PUNTER PROTOCOL .....  
 by Steve Punter  
 TIDBITS ..... Mdm Tips

## QUAIL ELECTRONICS

?FREE? PUBLIC DOMAIN 64 + 128 others soon

Your choice • BY THE BLOCK • Mix & Match

MANY HACKER GOODIES & TONS OF PARAMETERS  
 DISCOUNTS ON SOFTWARE, HARDWARE & ACCESSORIES

\* SEND FOR FREE CATALOG \*  
 (206) 254-0324 (Answering Machine on duty after hours)

QUAIL P.O. Box L-1 Woodland, Wash. 98674



## WHAT HAPPENED WHEN YOU WERE BORN?

You can find out with the **TIME TRAVELER** Computer program from NCI. Tells you Academy Awards, World Series winners, prices, presidents, headlines, annual income, avg. cost of home, calendar, much more. 1900-1986. Sell printout at flea mkts., shows, by mail. Great party gift. **Send \$39 for disk, or \$1 + SASE for printout.** Also includes TRIVIA game. Educational, interesting. For C64 & 128 with any printer. Not copy protected.

**FAST 1541.** Cartridge makes 1541 load AND save 5x faster. Adds new commands: dload, dsave, scratch, directory, back-up, rename, append, record#, collect. \$25.

205 McCormick Avenue Telephone 1-912-783-1158  
 Hawkinsville, Georgia 31036 Visa/MC/Check

## Authorized Commodore Service Center



C-64 .. \$43.95  
 \*1541 (align only) \$25.95  
 \*1541 (Repair) .. \$45.95  
 SX-64 .. \$80.95  
 \*Not including head stepper motors or spindle motor

C-128 .. 65.95  
 \*1571 (align only) .. 25.95  
 \*1571 (Repair) .. 45.95  
 CBM Printers (call)

We also service Epson, Star, NEC, IBM, Zenith & COMPAQ  
 Discounts for Dealers and Schools

CALL 305-785-2490  
 Advanced Video Technology  
 1310 S. Dixie Hwy, Ste. 18W  
 Pompano Beach, FL 33060

**SPECIALS**  
**ROM Upgrade for 128**  
**\$45.00**  
 Includes Documentation

Convert your C64/C128 to a DX7 with the

## SFX SOUND EXPANDER

SFX SOUND EXPANDER \$165.00  
 8 voice digital synthesizer module based on Yamaha FM technology

SFX FULL SIZED KEYBOARD \$130.00

SFX COMPOSER & SOUND EDITOR \$136.50

MIDI compatible sequencer and editor for Sound Expander

Fearn & Music, 519 W. Taylor #114, Santa Maria CA 93454, Phone 805-925-6682

## COMKITS



Entertaining, Easy to Build, Educational Plug-In Circuit Board Kits For The C-64.  
 Choose From:

Automatic Temperature Data Logger \$39.95  
 Electronic Color Organ \$39.95  
 Sonic Burglar Alarm \$39.95  
 "T" Cartridge Expander W/Reset \$29.95

Software Disk, All Parts And Complete Instruction Manual Included.  
 Visa or MC (orders only) Call 1-800-433-9088 Ext. 300. Or Send Check or Money Order  
 for \$39.95 + \$2.00 Shipping & Handling to: COMKITS, P.O. Box 69  
 Trumbull, NE 68980

### SURVEYOR I

Triangulation: Horizontal & Vertical Curves,  
 STATIONING and PRINTOUT for both curves,  
 Misc., Volumes in Cu. Ft., Cu. Yds. & Gals.

### SURVEYOR II\*

Traverse Closure: Average End Volume: Single End Area  
 By Compass Rule & Coordinate Method  
 Dist, Bet, Coord, w/bearings: Angle Bet, Bearings: Etc.

R&R HISSA 9500 S.W. 51 TERR, MIAMI, FL 33165  
 C128 or C64 \$24.95 ea.; PC \$29.95 ea.; Postpaid; Fla. Res. Add 5% Tax  
 Graphics Card required for PC; \*Printer required for Surveyor II

## COMMODORE 64

FINEST PUBLIC DOMAIN PROGRAMS

• HAND PICKED AND TESTED • \$1.50 • ON DISK •  
 YOU PICK THE PROGRAMS THAT YOU WANT!!!

FOR YOUR OWN LIST AND  
 DESCRIPTION OF THESE PROGRAMS  
 SEND JUST \$1.00 AND A SASE TO:

JLH CO.  
 DEPT 2  
 BOX 67021  
 TOPEKA, KS 66667



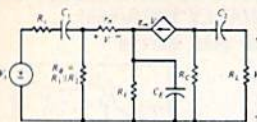
## Top-Tech International, Inc.

Advanced Computer Systems  
 2344 Perot Street • Philadelphia, PA 19130

YES!!! WE ARE DIFFERENT!!! Need Commodore Parts? Largest Selection in the U.S.A.!!! We Have No Competition: Hard to find custom chips; Burn-in-Quality parts; Improved Power Supplies; Original Commodore Service Manuals; Diagnostic Software & Service Equipment; SAM's "Computerfacts". FREE "Datassette" with any order!  
 Service? The only experienced repairmen you can trust! For years CBM has been our only business; we have the know-how! NO HIDDEN CHARGES! Any C-64 PCB repair with 1-year warranty—\$59.95—FREE burn-in test & shipping back! (Replacement—add ONLY \$19.95!). You will get what you are paying for!!! We service and supply: YOU, Computer Centers, Schools, U.S. Government, U.S. Navy, Air Force, NASA!  
**MONTHLY SPECIALS:** New "bug-free" ROM upgrade: C-128/\$38.50; 1571 DOS ROMs—call! Looking for PC-10?—CALL US FIRST!!! VISA & MASTER CARD welcome!  
 (215) 236-9901 • Commodore AUTHORIZED QUALITY SERVICE CENTER • (215) 236-9901



# RUN CLASS ADS



**ELECTRONICS AC/DC CIRCUIT ANALYSIS PROGRAM** \$29.95 Disk, Tape  
**Computer Heroes**  
 P.O. Box 79A  
 Farmington, CT 06034 C-64, C-128  
 Orders only 1-800-622-4070

Program computes general numeric solution to electronic circuit of up to 40 nodes and 63 branches. Branches may contain resistors, capacitors, inductors, current sources, voltage sources or 4 types of controlled sources. Computer displays node voltages, branch voltages, currents, powers and power factors. Step function of branch parameters or frequency with graphic display of results. Menu controlled and user friendly.

## ADULTS ONLY SOFTWARE for the Commodore 64/128



**ALVA DATA** Dept. JB  
 28 Alva Street,  
 New Bedford, MA 02740  
 (check, M.O., MC/VISA)  
 (Add \$2.00 shipping & handling.  
 Foreign orders Add \$6.00)

**THE LOVEGAME** Interactive fantasy game for two or more intimate players. Amusing and suggestive trivia quiz format with provocative "Scoring" system! \$24.95

**STUD'S CHALLENGE** A man's text adventure romp... The object of this game is to SCORE, figuring out how to please various types of women, and what turns them off. It takes all kinds!! \$21.95

### COLOR PRINTER RIBBONS

Red, Blue, Green, Brown, Purple, Yellow

Ribbons — Price Each	Black	Color	Ribbons — Price Each	Black	Color
Apple Imagewriter	3.95	4.95	Epson LX 80/90	3.60	4.25
Commodore MPS 801	4.15	4.75	Epson MX/FX/RX/80/85	3.75	4.25
Commodore MPS 802	5.75	6.75	Okidata 82	1.75	2.20
Commodore MPS 803	4.95	5.95	Shiksha SP 800/1000	5.25	6.50
Commodore MPS 1000	3.60	4.25	Star SG10	1.75	2.20
Commodore MPS 1525	5.50	—	Star NX10	5.00	6.00

T-Shirt Ribbons (Heat Transfer Ribbons)— Call For Price & Availability. Minimum order is \$25.00. Shipping & handling and C.O.D. are added to invoice. F.O.B. Manteno, IL. Illinois residents add 6.25% tax.

**RENCO COMPUTER PRINTER SUPPLIES**  
 P.O. Box 346, Bradley, IL 60915 U.S.A. • 1-800-522-6922 • 815-468-8081

## PERSONAL COMPUTER OWNERS

**EARN \$1000 TO \$5000 MONTHLY**  
**WORK AT HOME—IN YOUR SPARE TIME**  
 PERFORMING SIMPLE SERVICES WITH YOUR COMPUTER  
**FREE LIST OF 100 BEST SERVICES TO OFFER**  
 WRITE: A.I.M.M.W. P.O. BOX 60369, SAN DEIGO, CA. 92106



### C-64 REPAIR

**\$39.95**  
**INCLUDES PARTS/LABOR**

72 HOUR TURN-AROUND

Other Commodore Repairs at Low Prices  
 Our 10th Year  
 TM-Commodore Business Machines


**KASARA MICROSYSTEMS, INC.**  
 33 Murray Hill Drive  
 Spring Valley, N.Y. 10977  
 800-642-7634 (outside NY) • 914-356-3131  
 SEND FOR CHIPS/PARTS CATALOG

**WE SELL COMMODORE CHIPS AT LOW PRICES**  
 Prices subject to change

## HOME FIELD FOOTBALL!

Tired of football programs that sacrifice realism for looks and vice versa? Now get the best of both with Home Field Football. Over 30 offensive and defensive plays to choose from. Play against a friend or the formidable computer opponent. Home Field Football allows you to create your own teams and updates team statistics after each game! Print options give you hard copy of teams and division standings!

Order now for Christmas!!  
 Send \$14.95 (+ \$2.00 S/H) to:  
**R & R ENTERPRISES, P.O. BOX 41453**  
**PASADENA, CA 91104-8453**



## LIST OF ADVERTISERS

### ADVERTISING SALES:

Sales Manager: Steve Robbins

East Coast Sales: Ken Blakeman; Nancy Potter-Thompson (603) 924-7138 or (800) 441-4403;

West Coast Sales: Giorgio Saluti (415) 328-3470

Reader Service	Page	Reader Service	Page
427 Berkeley Softworks	2, 3	421 Micro Development	87
408 Briwall	49	424 Microllusions	CIII
406 Cardinal Software	91	416 N.A.P.I.	79
418 Computer Camp	79	400 Professional Software	CIV
423 Computer Direct	58, 59	405 Quantum Link	24, 25
415 Computer Friends	65	* RUN	
426 Davka Corp.	8	Limited Edition	47
401 Digital Solutions	1	ReRUN Subscription Ad	33
* Firebird Software	CII	* S & S Wholesalers	34, 35
412 Free Spirit Software	22	414 Skyles Electric Works	64
422 G.E. Ridge Services	91	429 Soft-Byte	8
419 Grapevine Data Products	83	407 Supra Corp.	4
430 I.H.T. Software	8	417 UltraByte	83
404 Ketek	21	402 Uptime	7
411 Lance Haffner Games	109	428 Utilities Unlimited	23
409 MicroComputer Services	72, 73	413 Xetec, Inc.	56
420 Micro Cube Corp.	87		

For further information from our advertisers, circle the corresponding Reader Service number on the Reader Service card.

\*This advertiser prefers to be contacted directly.

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

RUN is a publication of CW Communications/Inc. (CWCI), an International Data Group (IDG) company. CWCI is the world's largest publisher of computer-related periodicals, with more than 70 computer publications in 28 countries. 12 million people read one or more of CWCI's publications each month. Members of the CWCI group are connected by and contribute to the CW International News Service, offering the latest domestic and international computer news. Members of the group include: ARGENTINA'S *Computerworld Argentina, PC Mundo*; ASIA'S *Asian Computerworld, Communications World, AUSTRALIA'S Computerworld Australia, Communications World, Australian PC World, Australian Macworld, AUSTRIA'S Computerwelt Osterreich*; BRAZIL'S *DataNews, PC Mundo*; CHILE'S *Informatica, Computacion Personal*; DENMARK'S *Computerworld Danmark, PC World Danmark, RUN*; FINLAND'S *Tietoviikko, Mikro*; FRANCE'S *Le Monde Informatique, Distributive, Golden, InfoPC, Theoreme, Le Monde des Telecons*; GREECE'S *Micro & Computer Age*; HUNGARY'S *SZT Computerworld, Mikroslag*; INDIA'S *Dataquest*; ISRAEL'S *People & Computers Monthly, People & Computers Weekly*; ITALY'S *Computerworld Italia, PC World Magazine*; JAPAN'S *Computerworld Japan*; MEXICO'S *Computerworld Mexico*; THE NETHERLANDS' *Computerworld Netherlands, PC World Netherlands*; NEW ZEALAND'S *Computerworld New Zealand*; NORWAY'S *PC Mikrodatabase, Computerworld Norge*; PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld*; SAUDI ARABIA'S *Arabian Computer News*; SOUTH KOREA'S *The Electronic Times*; SPAIN'S *Computerworld Espana, Commodore World, PC World Espana*; SWEDEN'S *Computer Sweden, Mikrodatorn, Svenska PC World*; SWITZERLAND'S *Computerworld Schweiz*; UNITED KINGDOM'S *Computer News, DEC Today, ICL Today, PC Business World, UNITED STATES' AmigaWorld, Boston Computer News, Computerworld, Digital News, 80 Micro, FOCUS Publications, Insider, InfoWorld, MacWorld, Micro Marketworld, Network World, PC World, Publish!, RUN*; VENEZUELA'S *Computerworld Venezuela, PC World Venezuela*; WEST GERMANY'S *Computerwoche, PC Welt, Computer Business, Run, InfoWelt*.



# HAPPY HOLIDAYS FROM MICROILLUSIONS



## THIS SEASON MICROILLUSIONS' OFFERS:

For Amiga, C64/128 and MS DOS:

FAERY TALE ADVENTURE Today's hottest game! / BLACK JACK ACADEMY / ROMANTIC ENCOUNTERS AT THE DOME.

For Amiga and soon for C64/128 and MS DOS:

LAND OF LEGENDS / PLANETARIUM / EBONSTAR / FIREPOWER / GALACTIC INVASION / TURBO.

For Amiga:

DISCOVERY and DISCOVERY EXPANSION DISKS / PHOTON VIDEO / DYNAMIC CAD / MUSIC X / DYNAMIC WORD.

**microillusions**<sup>TM</sup>

17408 Chatsworth St., Granada Hills, CA 91344 • Inside CA 818/360-3715 • Outside CA 800/522-2041 • FAX 818/360-1464



# GIVE YOUR COMMODORE A FLEET TO COMMAND!



**"A" Rating.**  
- Run Magazine, March, 1987.

**Fleet System 2+ and 4 are powerful, easy to use and inexpensive. Both Fleet System 2+ for your Commodore 64 and Fleet System 4 for your Commodore 128 include an Integrated Dictionary and Thesaurus.**

The 90,000 Word Dictionary is the largest and fastest available for the C64/128 and will spell check a ten page document in just 45 seconds. There's even room for an additional 10,000 "Custom" words! The Integrated Thesaurus provides thousands of synonyms ("like" words) and antonyms ("opposite" words) instantly!

Fleet System 2+ and 4 have many other attractive features such as: Extra Text Areas, Mail Merge, Preview

Function and the ability to Insert, Delete and Move Text easily.

**Now Fleet System 2+ and 4 are easier to use than ever!**

You'll find it much easier to use your C64 with such Fleet System 2+ features as: Pop-Down Menus for easy access to all functions, Ability to *Cut and Paste* by words, sentences or paragraphs, Built-in Disk Utilities and enhanced printer support.

If you are a C128 user, Fleet System 4 offers such powerful features as: Help Screens, Ram-Expansion Support, and On-Screen Bold and Underline in Preview to Screen.

**Fleet Filer with Fleet System 2+ and 4 at no extra cost!**

Fleet Filer is a super-fast, menu-driven database that handles up to 5,000 records and 20 text or numeric fields. In addition, Fleet Filer will sort records and input/output information to Fleet System 2+, 4 and most major word processors. Fleet Filer can also be purchased separately for only \$39.95.

For more information, or the name of the dealer nearest you call: 1-800-343-4074.



**PSI** Professional Software, Inc.  
51 Fremont Street  
Needham, MA 02194  
(617) 444-5224

Fleet System 2+, 4 and Fleet Filer are designed and written by Visiontronics Group Inc. Commodore 64 and 128 are registered trademarks of Commodore Electronics Ltd.