November 1988

Canada $4.95 U.S. $3.95

Just for your Tandy Color Computer 1, 2 and 3

# The RAINBOW

THE COLOR COMPUTER MONTHLY MAGAZINE

## Election '88: Bush or Dukakis?

Keep Track of the Voting on Election Eve or Make Your Own Predictions!

# Our Telecommunications Issue

Add Xmodem Protocol to the CoBBS System

Connect the CoCo to Other Computers

CoCo 3 Modifications for CoBBS and REMOTE

Everything You Always Wanted to Know About Becoming a SysOp, But Were Afraid to Ask

Holiday Shopping Guide Inside!

A ... on th... ts, a ... mulation, BE... MORE!

# DIECOM PRODUCTS INC.

- Prices subject to change without notice.
- No refunds or exchanges permitted due to the nature of the product.

(Disk Only) Game, Phaser & Interface
**$29.95 U.S. $74.95 U.S.**
**$37.95 Can. $93.95 Can.**

GANTELET II – CoCo 3 Disk Only

**$29.95 U.S. - $37.95 Can.**

IRON FOREST – CoCo 3

(Tape or Disk)
**$29.95 U.S. - $37.95 Can.**

RUSH'N ASSAULT – CoCo 1, 2 or 3

**ALSO AVAILABLE:**
GRAND PRIX CHALLENGE, GATES OF DELIRIUM, WRESTLE MANIAC, GANTELET, CALADURIL FLAME OF LIGHT, LANSFORD MANSION, MARBLE MAZE, KNOCK OUT, BOUNCING BOULDERS, PAPER ROUTE, F-16 ASSAULT, KARATE, GOLD RUNNER II.
**UNIT PRICE: $29.95 U.S. - $37.95 Can.**

## DIECOM PRODUCTS INC.

6715 FIFTH LINE, MILTON, ONT., CANADA L9T 2X8

We accept:
VISA MasterCard
cheque or money order

24 hr. order line:
(416) 878-8358
personal service 9-5
E.S.T.

Please add $2 for shipping and handling (add $5 each for The Rat and all Light Phaser Packages). Ontario residents add 8% sales tax. Looking for new software.

## XENION:

Pilot your Xenion XE-II fighter over hostile enemy planets in order to rid the galaxy of evil. Hordes of alien attack ships will try to stop you in the air. Watch out for cyclops cannons and tanks which will fire at you from the ground. And beware, mother ships will appear and try to finish you off. You can pick up smart bombs from the planet and use them in your fight against the enemy. Dozens of screens of detailed terrain make this a great game for everyone.

**64 k CoCo 1 or 2 and joystick required. Tape or Disk.**

**$29.95 U.S.**
**$37.95 Can.**

**128 k CoCo 3 joystick and disk drive required.**

## MEDIEVAL MADNESS:

You have been asked by the King of a mysterious land to rescue his daughter, the fair Princess, from the clutches of an unknown evil! Armed only with your crossbow, you set out into the unknown land on your quest. As you enter the mysterious land you find yourself surrounded by swarms of odd creatures that inhabit the land. You take aim, and fire. A direct hit. The monster slowly fades away, leading you to believe something magical controlled the hideous creature. You press forward not knowing what will appear next. MEDIEVAL MADNESS, our second light phaser game has many detailed playing screens and loads of monsters to keep you playing for hours. Multiple skill levels increase the difficulty of the game and make it fun for the beginner or advanced player. Can you rescue the princess? Only time will tell!

Medieval Madness Game, Phaser & Interface
**$29.95 U.S. $74.95 U.S.**
**$37.95 Can. $93.95 Can.**

**128 k CoCo 3 and disk drive required.**

## THE RAT GRAPHIC DESIGN PACKAGE:

This is the most complete graphics design package currently available for the CoCo 3. It supports 320 x 200 hi-res graphics mode with a 16 colour user definable palette. You can draw lines, circles, ovals, boxes, polygons and many more standard drawing functions. You can get stamps from the screen which can then be enlarged, shrunk, rotated, inverted and flipped and then be redisplayed on the screen in various ways. You can paint areas of the screen in one of the pre-defined colour textures or define your own custom textures. You can label your pictures with one of the pre-defined fonts or define your own custom lettering style. Now don't worry about trying to draw your picture with the keyboard or even a cumbersome joystick, "THE RAT" comes with its own MOUSE. Yes that's right, it comes with a MOUSE, and not a simple analog one button mouse. Ours is a high quality digital, two button mouse like you would find on a more expensive computer like the Tandy 1000. You don't have to worry about selection squares around your drawing screen, just push a button on the mouse and you flip to a separate screen to select your drawing mode. Or you can use one of our pull down menus to load and save your pictures on disk. We also include screen print routines for many of the most popular printers.

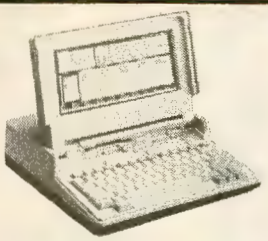
Now that's a GRAPHIC DESIGN PACKAGE that beats them all! That's right, you get the graphics program, screen print routines, the mouse and the mouse pad all for one low price of:

**$79.95 U.S. $99.95 Can.**

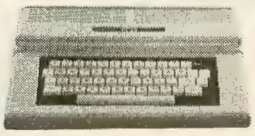
**Requires 128 k CoCo 3 and one disk drive.**

*From Computer Plus to YOU . . .*

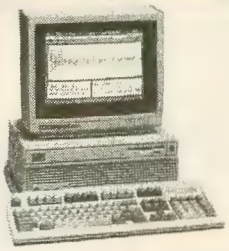
# PLUS after PLUS after PLUS



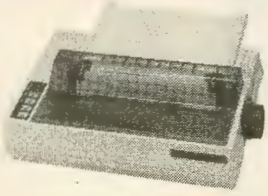
Tandy 1400 LT $1369
Tandy 102 32K $439
Tandy 200 24K $429*



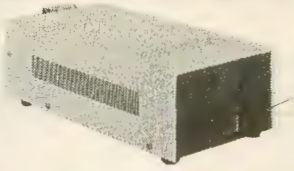
Color Computer 3
w/128K Ext. Basic $115*



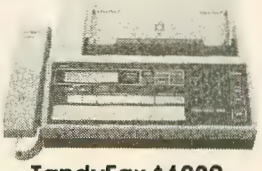
Tandy 1000 SL $689
Tandy 1000 TL $969



DMP-132 $245*



Color Computer Disk Drive
Drive 0 $179* Drive 1 $149



TandyFax $1029

## BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

| COMPUTERS | |
|---|---|
| Tandy 1000 HX 1 Drive 256K | 439.00* |
| Tandy 1000 TX 1 Drive 640K | 799.00* |
| Tandy 3000 NL 1 Drive 512K | 1279.00 |
| Tandy 4000 1 Drive 1 Meg.Ram | 1959.00 |
| Tandy 5000 MC 2 Meg. Ram | 3799.00 |
| **PRINTERS** | |
| Radio Shack DMP-106 80 CPS | 169.00 |
| Radio Shack DMP-132 120 CPS | 245.00* |
| Radio Shack DMP-440 300 CPS | 549.00 |
| Radio Shack DWP-230 Daisy Wheel | 349.00 |
| Tandy LP-1000 Laser Printer | 1899.00 |
| Star Micronics NX-1000 144 CPS | 199.00 |
| Star Micronics NX-1000 Rainbow | 269.00 |
| Panasonic P-1080i 144 CPS | 199.00 |
| Panasonic P-1091i 194 CPS | 249.00 |
| Panasonic P-1092i 240 CPS | 369.00 |
| Okidata 320 300 CPS | 369.00 |
| Okidata 390 270 CPS 24 Wire Hd | 515.00 |
| NEC Pinwriter P-2200 170 CPS | 399.00 |
| **MODEMS** | |
| Radio Shack DCM-6 | 52.00 |
| Radio Shack DCM-7 | 85.00 |
| Practical Peripheral 2400 Baud | 229.00 |
| Practical Peripheral 1200 Baud | 149.00 |

| COLOR COMPUTER MISC. | |
|---|---|
| Radio Shack Drive Controller | 99.00 |
| Extended Basic Rom Kit (28 pin) | 14.95 |
| 64K Ram Upgrade Kit (2 or 8 chip) | 39.00 |
| Radio Shack Deluxe Keyboard Kit | 24.95 |
| HI-RES Joystick Interface | 8.95 |
| Color Computer Deluxe Mouse | 44.00 |
| Multi Pak Pal Chip for COCO 3 | 14.95 |
| PBH Converter with 64K Buffer | 119.00 |
| Serial to Parallel Converter | 59.95 |
| Radio Shack Deluxe Joystick | 26.95 |
| Magnavox 8515 RGB Monitor | 329.00 |
| Magnavox Green or Amber Monitor | 99.00 |
| Radio Shack CM-8 RGB Monitor | 249.00 |
| Radio Shack VM-4 Green Monitor | 99.00 |
| PBJ 0K COCO 3 Upgrade Board | 19.95 |
| PBJ 512K COCO 3 Upgrade | 159.00 |
| Tandy 0K COCO 3 Upgrade Board | 24.95 |
| Tandy 512K COCO 3 Upgrade | 149.00 |

| COLOR COMPUTER SOFTWARE | TAPE | DISK |
|---|---|---|
| The Wild West (CoCo3) | | 25.95 |
| Worlds Of Flight | 34.95 | 34.95 |
| Mustang P-51 Flight Simul. | 34.95 | 34.95 |
| Flight 16 Flight Simul. | 34.95 | 34.95 |

| | | |
|---|---|---|
| COCO Util II by Mark Data | | 39.95 |
| COCO Max III by Colorware | | 79.95 |
| Max 10 by Colorware | | 79.95 |
| AutoTerm by PXE Computing | 29.95 | 39.95 |
| TW-80 by Spectrum (CoCo3) | | 39.95 |
| TeleWriter 64 | 49.95 | 59.95 |
| TeleWriter 128 | | 79.95 |
| Elite Word 80 | | 79.95 |
| Elite Calc 3.0 | | 69.95 |
| CoCo 3 512K Super Ram Disk | | 19.95 |
| Home Publisher by Tandy (CoCo3) | | 35.95 |
| Sub Battle Sim. by Epyx (CoCo3) | | 26.95 |
| Thexder by Sierra (CoCo3) | | 22.45 |
| Kings Quest III by Sierra (CoCo3) | | 31.45 |
| Flight Sim.II by SubLogic (CoCo3) | | 31.45 |
| OS-9 Level II by Tandy | | 71.95 |
| OS-9 Development System | | 89.95 |
| Multi-View by Tandy | | 44.95 |
| VIP Writer (disk only) | | 69.95 |
| VIP Integrated Library (disk) | | 149.95 |

Prices are subject to change without notice. Please call for shipping charges. Prices in our retail store may be higher. Send for complete catalog

*Sale prices through 11/30/88

## CALL TOLL FREE
## 1-800-343-8124

- *LOWEST POSSIBLE PRICES*
- *BEST POSSIBLE WARRANTY*
- *KNOWLEDGEABLE SALES STAFF*
- *TIMELY DELIVERY*
- *SHOPPING CONVENIENCE*

VISA AMERICAN EXPRESS MasterCard

## computer plus

P.O. Box 1094
480 King Street
Littleton, MA 01460

SINCE 1973

IN MASSACHUSETTS CALL (508) 486-3193

TRS-80 is a registered trademark of Tandy Corp.

# RAINBOW

## Table of Contents

November 1988
Vol. VIII No. 4

58


**80**
***Get the Point***
William P. Nee
*Part V: Machine Language Made BASIC*

**88**
***CoBBS Xmodem Routines***
Robert John Grubb
*Upload and download Xmodem protocol using the CoBBS system*

**102**
***Washington, Adams, Jefferson . . .***
Ralph D. Miller
*A program to help memorize and list the names of the U.S. presidents in order*

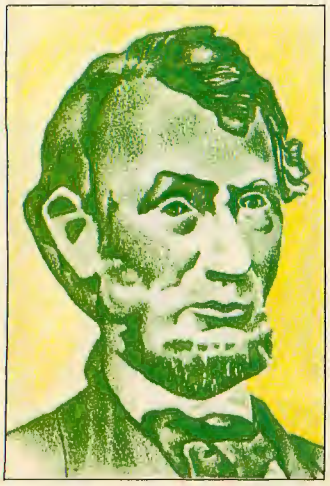
**110**
***A Remote Update***
Paul Alger
*Modify an old favorite to use on the CoCo 3*


## Features


**16**
***A CoBBS Update***
Kevin Sloan
*Modifying the CoBBS system to work with a CoCo 3*

**28**
***The Computer Connection***
Don Hutchison
*Connecting a CoCo to other computers*

102


**36**
***So You Want to Be a SysOp***
Dave Jenkins
*You see the glamour, let me tell you about the work*

**41**
***RAINBOW'S Holiday Shopping Guide***
Staff
*Making a list? Check out these CoCo gift suggestions*

**45**
***Playing the Stock Market***
Mark Webb
*Wall Street comes to your CoCo screen with this game of luck and skill*

**58**
***Election '88***
Leonard Hyre
*Keep track of presidential election results and make your own predictions*


36

## Novices Niche


**74**
**Free Zone**
Ric Pucella

**75**
**I/O in the Fast Lane**
Joel Hegberg

**75**
**Showing Off Random Graphics**
Allen Goff

**76**
**It's a Bug-Eat-Bug World**
Stephen Elms

**77**
**Odd One Out**
Ken Ostrer


The cassette tape/disk symbols beside features and columns indicate that the program listings with those articles are on this month's RAINBOW ON TAPE and RAINBOW ON DISK. Those with only the disk symbol are not available on RAINBOW ON TAPE. For details, check the RAINBOW ON TAPE and RAINBOW ON DISK ad on Page 12.

## Columns


**140**
**BASICally Speaking**
Bill Bernico
*BASIC problems solved here*

**84**
**BASIC Training**
Joseph Kolar
*What's the angle?*

**142**
**CoCo Consultations**
Marty Goodman
*Just what the doctor ordered*

**33**
**Delphi Bureau**
Don Hutchison
*New faces, new places, a discussion on computer viruses and Don's database report*

**144**
**Doctor ASCII**
Richard Esposito
*The question fixer*

**40**
**Education Notes**
Steve Blyn
*You can't get there from here*

**8**
**PRINT#-2**
Lawrence C. Falk
*Editor's Notes*

**157**
**Turn of the Screw**
Tony DiStefano
*A simple — expandable — LED project*

**146**
**Wishing Well**
Fred Scerbo
*Growing up with CoCo*


## Rainbowtech


**172**
**Accessible Applications**
Richard A. White
*Boot mysteries revealed*

**160**
**Barden's Buffer**
William Barden, Jr.
*Sorting it all out*

**176**
**KISSable OS-9**
Dale L. Puckett
*Installation, automation and more*


## Product Reviews


**BASIC Utility Diskette**/*T.E.M. of California* ____ **129**
**Castle of Tharoggad**/*Tandy Corporation* ____ **130**
**DELPHI: The Official Guide**/*Simon & Schuster* ____ **133**
**EZGen**/*Burke & Burke* ____ **137**
**Hard Disk Organizer**/*Robert A. Hengstebeck* ____ **136**
**Keyboard Commander**/*E.Z. Friendly Software* ____ **135**
**OS-9 Level II BBS**/*Alpha Software Technologies* ____ **130**
**Spellbound**/*Thor Software* ____ **136**
**V-Term**/*Gimmesoft* ____ **134**
**Video Draw Poker**/*Prometheus Software* ____ **134**
**Vocal Freedom**/*Dr. Preble's Programs* ____ **126**


## Departments


**Advertisers Index** ____ **192**
**Back Issue Info** ____ **123**
**BBS Listings** ____ **106**
**CoCo Gallery** ____ **26**
**Corrections** ____ **138**
**Hints** ____ **83, 92**
**Letters to Rainbow** ____ **6**
**One-Liner Info** ____ **114**
**Racksellers** ____ **190**
**Received & Certified** ____ **139**
**Submitting Material to Rainbow** ____ **82**
**Subscription Info** ____ **116**



**THE RAINBOW** is published every month of the year by FALSOFT, Inc., The Falsoft Building, 9509 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059, phone (502) 228-4492. **THE RAINBOW**, **RAINBOWfest** and **THE RAINBOW** and **RAINBOWfest** logotypes are registered ® trademarks of FALSOFT, Inc. • Second class postage paid Prospect, KY and additional offices. USPS N. 705-050 (ISSN No. 0746-4797). POSTMASTER: Send address changes to **THE RAINBOW**, P.O. Box 385, Prospect, KY 40059. Authorized as second class postage paid from Hamilton, Ontario by Canada Post, Ottawa, Ontario, Canada.


• Entire contents copyright © by FALSOFT, Inc., 1988. **THE RAINBOW** is intended for the private use and pleasure of its subscribers and purchasers and reproduction by any means is prohibited. Use of information herein is for the single end use of purchasers and any other use is expressly prohibited. All programs herein are distributed in an "as is" basis, without warranty of any kind whatsoever. • Tandy, Color BASIC, Extended Color BASIC and Program Pak are registered ® trademarks of the Tandy Corp.


• Subscriptions to **THE RAINBOW** are $31 per year in the United States. Canadian rates are U.S. $38. Surface mail to other countries is U.S. $68, air mail U.S. $103. All subscriptions begin with next available issue. • Limited back issues are available. Please see notice for issues that are in print and their costs. Payment accepted by VISA, MasterCard, American Express, cash, check or money order in U.S. currency only. Full refund after mailing of one issue. A refund of 10/12ths the subscription amount after two issues are mailed. No refund after mailing of three or more magazines.



**The Rainbow**

**Editor and Publisher**
Lawrence C. Falk

**Managing Editor** Jutta Kapfhammer
**Associate Editor** Sue Fomby
**Reviews Editor** Lauren Willoughby
**Submissions Editor** Angela Kapfhammer
**Copy Editor** Beth Haendiges
**Technical Editors** Cray Augsburg, Ed Ellers
**Technical Assistant** David Horrar
**Editorial Assistants** Wendy Falk Barsky, Sue H. Evans
**Contributing Editors** William Barden, Jr., Bill Bernico, Steve Blyn, Tony DiStefano, Richard Esposito, Martin Goodman, M.D., Joseph Kolar, Dale Puckett, Fred Scerbo, Richard White
**Art Director** Heidi Maxedon
**Designers** Sharon Adams, Teri Kays, Denise Webb
**Typesetters** Linda Stone Gower, Renee Hutchins

**Falsoft, Inc.**

**President** Lawrence C. Falk
**General Manager** Bonnie Frowenfeld
**Asst. General Mgr. for Finance** Donna Shuck
**Admin. Asst. to the Publisher** Sarah Levin
**Editorial Director** John Crawley
**Asst. Editorial Director** Judi Hutchinson
**Senior Editor** T. Kevin Nickols
**Director of Production** Jim Cleveland
**Chief Bookkeeper** Diane Moore
**Dealer Accounts** Judy Quashnock
**Asst. General Manager For Administration** Sandy Apple
**Word Processor Manager** Patricia Eaton
**Customer Service Manager** Beverly Bearden
**Customer Service Representative** Carolyn Fenwick
**Development Coordinator** Ira Barsky
**Chief of Printing Services** Melba Smith
**Dispatch** Tony Olive
**Business Assistants** Dawn Cecil, Laurie Falk
**Chief of Building Security and Maintenance** Jessie Brooks
**Advertising Coordinator** Doris Taylor
**Advertising Representatives** Belinda Kirby, Kim Vincent
**Advertising Assistant** Debbie Baxter
**(502) 228-4492**

**For RAINBOW Advertising and Marketing Office Information, see Page 192**



**Cover photograph copyright © 1988 by Carl Maupin**
**Art direction by Heidi Maxedon**

# Letters to the RAINBOW

## BACK TALK

*Editor:*

I was a bit dismayed by Richard Esposito's answer to Elbert Jenkins in the September '88 "Doctor ASCII" column [Page 138]. He infers that Mr. Jenkins problem with writing to the *VIP Library* disk has to do with copy protection. This is not the case at all! Mr. Jenkins finds zero grans available on the disk because the "leftover" room on the disk has been disabled by placing a value in the GAT pointing to this area. Primarily, this is done to prevent writing to the master disk and possibly crashing it. Mr. Jenkins could (on a backup) use his *VIP DiskZap* to find a full granule that is open and place $FF in the GAT at the byte pointing to that granule. Then he could save his program to the disk.

*D.S. Ricketts*
*Boring, OR*

## REVIEWING REVIEWS

*Editor:*

I am very fond of *VIP Writer III* and thought that I should add a couple of comments to Ms. Willoughby's nice review of it. The customizer program is apparently much more extensive than indicated in the review. It not only configures *VIP Writer III* with the screen width, line width, screen and printer margins, baud rate, parallel or serial printer driver, etc., it also has three programmable function keys so that they are available as soon as you boot up the program. Ms. Willoughby mentions the use of the CLEAR key as a "control key," just like the old *Writer.* The CTRL key serves the same purpose now, so you have a control key on both sides! Ms. Willoughby didn't like the partial saving of the text if the cursor wasn't at the top of the file — I consider that little feature a *vital* asset because many times I need to save only a portion of the buffer. And, as stated in the review, *VIP Writer III* does tell you that you have done only a partial save — in text and with a loud *bong*. Finally, when overstriking a line of text and going past the end of that line, all you have to do is press BREAK to take out the newly inserted line and simply delete anything necessary.

*D.S. Ricketts*
*Boring, OR*

## INFORMATION PLEASE

*Editor:*

I run a 24-track studio and own three CoCos for music production and would like to know if anyone out there has a patch or modification for Radio Shack's *Audio Spectrum Analyzer* for the CoCo 3.

*Michael Bridges*
*Germantown Recording Studio*
*1209 Ave. N.*
*Nashville, TN 37208*

## HINTS & TIPS

*Editor:*

I recently ruined my Multi-Pak Interface by trying to upgrade it myself, so I wound up buying a new one. In Marty Goodman's "CoCo Consultations," July '88 [Page 146], Marty said that Tandy was not selling CoCo 3-compatible Multi-Paks. I wrote Tandy and was told that the discontinued Multi-Paks were the ones with the satellite board installed. So, if you are thinking about buying a new Multi-Pak for the CoCo 3, first look in the port that plugs into the CoCo. If you see a small satellite board, the Multi-Pak is upgraded. If not, you will need to upgrade.

I have also heard that the new Multi-Paks have a small side effect. When you turn off your CoCo, sometimes the drive motor comes on. This is due to noise being introduced into the Multi-Pak through the CoCo. If this happens, press reset, or turn both the CoCo and the Multi-Pak off and on again.

*John Cleaveland*
*Lunenburg, Nova Scotia*

### A Memory Aid

*Editor:*

Since my purchase of ADOS and *Sub-Battle Simulator*, I have had to memorize several commands for each of my command keys. Instead of memorizing the commands for each program, I have made several placards, which frame my keyboard. On these placards — one for each program — I have written the functions of the various keys either next to the key or in the margin. Poster board, manila folder, etc. could be used to make the placards, and you can make as many as you need.

Also, as a member of the printing industry, I was quite impressed with your May and June covers. I think that they are the best covers you've printed to date. I think the coated paper cover for the July issue and the decision to seal the magazine in plastic were great ideas. Sealing the magazine in plastic not only protects the product, but it also looks sophisticated.

*Craig Bathurst*
*Greenville, SC*

## KUDOS

*Editor:*

I live in New Zealand and have been operating a Color Computer for about four years. I own a CoCo 3. As a teacher, I find my computer an invaluable aid to preparing work for my pupils. Unfortunately, the CoCo is no longer sold in this country, and all necessary computer purchases must be ordered from various places in the United States. I write to thank you for your impressive publication and to offer some advice to others in my situation.

THE RAINBOW is a must for anyone in an isolated situation. The ads and the reviews really help users to choose the best software for their needs. I have had to purchase a lot of software since I upgraded to my CoCo 3, and every issue of RAINBOW tempts me to purchase more. While I have been more than happy with most of my purchases, there are occasional problems. The *general* rule seems to be that the more you pay for software, the better it is.

Another tip I must pass on to others in my situation concerns mail order suppliers. There is nothing more nerve-wracking than to order an expensive or delicate item by phone and then to wait as the weeks tick by, peering hopefully into the mailbox every day. I have ordered from many suppliers and would like to recommend those who have provided excellent and reliable service.

Computer Plus heads my list. It provides friendly and reliable service of the first order. Microcom Software can also be relied upon, and Micro World is another firm that provided regular first rate service.

Thank you, RAINBOW, for providing a contact with the rest of the CoCo Community.

*Phil Burt*
*North Canterbury, New Zealand*

**AUTOTERM**
TURNS YOUR COLOR COMPUTER INTO THE
**WORLD'S SMARTEST TERMINAL!**
YOU'LL ALSO USE AUTOTERM FOR SIMPLE WORD PROCESSING & RECORD KEEPING

**EXTRA FEATURES ON COCO 3 DISK**
80 char. screen, 2400 baud thru serial port,
95,000 to 475,000 character buffer.

**EASY COMMUNICATION** + **WORD PROCESSING** + **TOTAL AUTOMATION**

Full prompting and error checking. Step-by-step manual has examples. Scroll text backward and forward. No split words on screen or printout. Save, load, delete files while on line. Print, save all or any part of text. 300 or 1200 baud. All 128 ASCII characters. Works with D.C. Hayes or any modem. Screen widths of 32, 40, 42, 51, 64.
**DISK VERSION SUPPORTS RS232 PAK, XMODEM and SPLIT SCREEN FOR PACKET RADIO.**

Editing is super simple with the cursor. Find strings instantly too! Insert printer control codes. Specify page size and margins. Switch quickly between word processing and intelligent terminal action. Create text, correct your typing errors; then connect to the other computer, upload your text or files, download information, file it, and sign-off; then edit the receive data, print it in an attractive format, and/or save it on file. Compatible with TELEWRITER.

Advanced system of keystroke macros lets you automate any activity, such as dial via modem, sign-on, interact, sign-off, print, save. Perform entire session. Act as message taker. At start-up, disk version can automatically set parameters, dial, sign-on, interact, read/write disk, sign-off, etc. Timed execution lets AUTOTERM work while you sleep or play. No other computer can match your COCO's intelligence as a terminal.

Please hire the mentally retarded. They are sincere, hard working and appreciative. *Thanks!*
*Phyllis.*

**CASSETTE $29.95**
**DISKETTE $39.95**
Add $3 shipping and handling
**MC/VISA/C.O.D.**

**PXE Computing**
**11 Vicksburg Lane**
**Richardson, Texas 75080**
**214/699-7273**


## PEN PALS

• I am a 17-year-old grade 12 student at St. Jerome's High School in Kitchener and would like to have pen pals from anywhere, but preferably close so we can meet sometimes. I have a 64K CoCo 2, one disk drive, a tape recorder and a DMP-130A printer. I like writing special-purpose programs and would like to help anyone with problems.

*Anton Peter Milardovic*
*8 Smetana Dr.*
*Kitchener, ON, Canada N2B 3B8*

• I am a 16-year-old male and would like to hear from anyone in the United States. I prefer someone around my age, but I will answer anyone. I have a 64K CoCo 2, CoCo 3, disk drive, cassette recorder, Multi-Pak, DMP-130, RS Speech & Sound Pak and *Orchestra 90*. I an interested in music, graphics, machine language, Adventures and games.

*Orman Beckles*
*45 Meridian St.*
*Malden, MA 02148*

• I am a 20-year-old man looking for pen pals who have a CoCo 2 or 3. My system includes a CoCo 3, 501 disk drive, cassette recorder and DMP-105 printer. My other interests are sports, baseball-card collecting and photography. I will answer all replies.

*Charles Braude*
*69-10 Yellowstone Blvd.*
*Forest Hills, NY 11375*

• I am 14 years old. I have a CoCo 3 and my hobbies are freestyle skateboarding and swimming. I love to listen to music and watch movies. I would like for a girl my age or older to answer my letter, but if anyone else writes, I'll answer as many as possible.

*Timothy W. Smith*
*Rt. 1 Box 147*
*Leland, NC 28451*

• I am 13 years old and would like some pen pals from all over the world. I own upgraded CoCos 1 and 2, a DMP-105, FD 502 and a Multi-Pak Interface. I love Adventure games and science. I will answer all letters — no age limits.

*Juli Williams*
*Star Rt. 24-2A*
*Graford, TX 76045*

• I am 16 years old and looking for pen pals aged 14 to 21. I am interested in everything about my computer. I have a 64K CoCo 2, one FD 500 drive and a DMP-110. I welcome letters from all over the world.

*Bednarek Luc*
*Hanebergstr. 62*
*3960 Beverlo*
*Belgium*

• I am 16 years old and interested in a pen pal. All letters will be appreciated.

*Christie Goedert*
*Rt. 3 Box 265*
*Stockton, MO 65785*

**THE RAINBOW welcomes letters to the editor. Mail should be addressed to: Letters to Rainbow, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. Letters should include the writer's full name and address. Letters may be edited for purposes of clarity or to conserve space.**

**Letters to the editor may also be sent to us through our Delphi CoCo SIG. From the CoCo SIG> prompt, type RAI to take you into the Rainbow Magazine Services area of the SIG. At the RAINBOW> prompt, type LET to reach the LETTERS> prompt and then select Letters for Publication. Be sure to include your complete name and address.**

# Computer Uses — You Decide

My all-time favorite computer story is about the friend who came over many years ago, to look at my new Color Computer.

It was hooked up to a television set (that being the monitor) in our spare bedroom — somewhat affectionately known as the "blue room" since the walls were painted blue and there was a blue carpet on the floor — and sat in regal splendor on a roll-top desk I had bought several years before.

"What does it do?" he asked.

Since this was a 4K Color Computer (the largest amount of memory at the time) with BASIC built in, and since I had just taught myself some very basic BASIC, I did some simple things like changing the color of the screen, making the computer count to 100 very quickly and the like.

Even then, I am afraid, I was into toys. My friend had been through several crazes, suffered through explanations of why this or that was the greatest thing since sliced bread, and watched and waited as I grew tired of them. I am sure he viewed the computer as "Lonnie's latest toy" and viewed my enthusiasm with skepticism.

After a half-hour demonstration, he asked me one simple question: "But how do you ask it questions and get answers?"

"You don't," I replied. "It only gives you back what you have put into it."

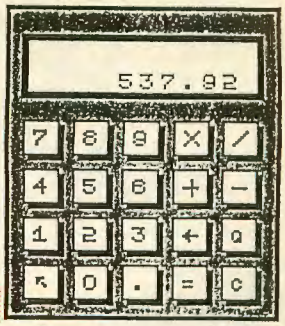
"Well, what good is it?" he asked. "I want answers to questions."

Today my friend has two computers in his house. One is a Color Computer; the other is a Tandy 1000.

I am relating this story because this is our November issue and you can do a friend of yours a favor by telling him or her about your computer.

(continued on Page 14)

# Word Power 3.2




**More Versatile • More Powerful With**
**Spooler • Calculator • Split-Screen • 2-Column Printing**

**Unparalleled Power** packed in this 100% ML Word Processor written from scratch for the CoCo 3! **No other word processor offers such a wide array of features that are easy to learn & use.**

## DISPLAY & SPEED

Word Power 3.2 runs at double-clock speed and uses the **true 80-column display** with lowercase instead of the graphics screen. The result is lightning fast screen reformatting and added speed! **All prompts are displayed in plain English in neat colored windows.** The current column number, line number, page number, percentage of free memory is displayed at all times. Even the **page break** is displayed so you know where one page ends and the other begins. The Setup program allows you to change fore/background colors as well as (in)visible carriage returns. Word Power 3.2 can be used with RGB/Composite/Monochrome monitors as well as TV.

## MAXIMUM MEMORY

Word Power 3.2 gives you **over 72K** on 128K and **over 450K** on 512K CoCo 3 for Text Storage - more memory than any other CoCo word-processor. Period.

## EFFORTLESS EDITING

Word Power 3.2 has one of the **most powerful and user-friendly full-screen editor with word-wrap.** All you do is type. Word Power takes care of the text arrangement. The unique **Auto-Save** feature saves text to disk at regular intervals for peace of mind.

Insert/Overstrike Mode (Cursor Style Changes to indicate mode);OOPS Recall during delete;Type-ahead Buffer for fast typers;Key-Repeat (adjustable); Key-Click; 4-way cursor and scrolling; Cursor to beginning/end of text, beginning/end of line, top/bottom of screen, next/previous word; Page up/down; Delete character, previous/next word, to beginning/end of line, complete line, text before/after cursor; Locate/Replace with Wild-Card Search with auto/manual replace; Block Mark, Unmark, Copy, Move & Delete; Line Positioning (Center/Right Justified); Set/Reset 120 programmable tab stops; Word-Count; Define Top/Bottom/Left/Right margins & page length. You can also highlight text (underline-with on-screen underlining, bold, italics, superscripts, etc.). Word Power even has a **HELP** screen which an be accessed any time during edit.

## SPLIT-SCREEN EDITING

Splits the screen in half so you can view one portion of your text while you edit another. You'll love it!

## MAIL-MERGE

Ever try mailing out the same letter to 50 different people? Could be quite a chore. Not with Word Power 3.2! Using this feature, you can type a letter, follow it with a list of addresses and have Word Power print out personalized letters. It's that easy!

## CALCULATOR

Pop-up a 4-function calculator while you edit! Great for tables!

## SAVING/LOADING TEXT

Word Power 3.2 creates ASCII format files which are compatible with almost all terminal/spell-checking & other word-processing programs. Allows you to Display Free Space, Load, Save, Append & Kill files. The ARE YOU SURE? prompt prevents accidental overwriting & deletion. You can select files by simply cursoring through the disk directory. Supports double-sided drives & step-rates.

## PRINTING

Word Power 3.2 drives almost any printer (DMP, EPSON, GEMINI, OKIDATA, etc). Allows options such as baud rates, line spacing, page/print pause, partial print, page numbering/placement, linefeeds, multi-line headers/footers, right justification & number of copies. The values of these parameters & margins can be changed anytime in the text by embedding Printer Option Codes. The **WHAT YOU SEE IS WHAT YOU GET** feature allows you to preview the text on the screen as it will appear in print. You can view margins, page breaks, justification & more.

## PRINT SPOOLER

Why buy a hardware Print Spooler? Word Power 3.2 has a **built-in Spooler** which allows you to simultaneously edit one document & print another.

## TWO-COLUMN PRINTING

This unique feature allows you to print all or portion of your text in **two columns!** Create professional documents without hours of aligning text.

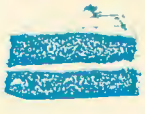
## SPELLING CHECKER

Word Power 3.2 comes with spelling checker/dictionary which finds & corrects mistakes in your text. You can add words to /delete words from dictionary.

## PUNCTUATION CHECKER

This checker will proofread your text for punctuation errors such as capitalization, double-words, spaces after periods/commas, and more. Its the perfect addition to any word processor.

## DOCUMENTATION



Word Power 3.2 comes with a well-written instruction manual & reference card which makes writing with Word Power a **piece of cake!** Word Power 3.2 comes on an UNPROTECTED disk and is compatible with RSDOS. Only **$79.95**

(Word Power 3.1 owners can get Word Power 3.2 Upgrade FREE by sending proof of purchase & $5.00 to cover S&H costs & instructions)

**MICROCOM SOFTWARE** 2900 Monroe Ave, Rochester,NY 14618. Ph: (716) 383-8830

**All orders $50 & above shipped by UPS 2nd Day Air at no extra charge within US.** We accept Visa, MasterCard, Amex, Check or MO. Sorry, no CODs. Please add $3 S&H (USA/CANADA); except where specified otherwise; Foreign 10% S&H(minimum $5). New York State residents please add sales tax. Looking for new software/hardware.

**To Place Credit Card Orders Call Toll Free 1-800-654-5244 9am-8pm Monday-Saturday**

Order Status, Information, Technical Information, call 716-383-8830

# A Great Holiday Gift Idea!

## RAINBOW Binders

### Distinctive, Durable RAINBOW Binders

THE RAINBOW is a vital resource to be referred to again and again. Keep your copies of THE RAINBOW safe in our quality, distinctive binders that provide complete protection.

These **attractive red vinyl binders** showcase your collection and ensure your RAINBOWs are in mint condition for future use. Each binder is **richly embossed with the magazine's name in gold** on the front and spine. They make a handsome addition to any room.

### Put an End to Clutter

Organize your workspace with these tasteful binders. Spend more time with your CoCo and eliminate those frustrating searches for misplaced magazines.

**A set of two binders**, which holds a full 12 issues of THE RAINBOW, is only $13.50 (plus $2.50 shipping and handling).

### Special Discounts on Past Issues

To help you complete your collection of THE RAINBOW, we're offering a **special discount on past issues** of the magazine.

When you place an order for six or more back issues of THE RAINBOW at the same time you order binders, you are entitled to $1 off the regular back issue price. To order, please see the "Back Issue Information" page in this issue.

### Know Where to Look

You may purchase the "Official And Compleat Index To THE RAINBOW" for $1 when you purchase a set of binders. This comprehensive index of RAINBOW's first three years (July 1981 through July 1984) is usually priced at $2.50.

For greater convenience, order RAINBOW Binders through the shopping area of the CoCo SIG of Delphi!

_____ **YES**. Please send me _____ set(s) of RAINBOW binders

**Take advantage of these special offers with your binder purchase:**

_____ Save $1 off the single issue cover price for back issues. Minimum order of 6 magazines. Please enclose a back issue order form from a recent issue indicating magazines wanted.

_____ Purchase the "Official and Compleat Index to THE RAINBOW" for $1. (Regular price $2.50.)

(These offers good only with the purchase of a RAINBOW binder set)

Name _____

Address _____

City _____ State _____ ZIP _____

☐ My check in the amount of _____ is enclosed. (In order to hold down costs, we do not bill.)

Charge to: ☐ VISA ☐ MasterCard ☐ American Express

Account Number _____ Expiration Date _____

Signature _____

Mail to: **Rainbow Binders, The Falsoft Building, P.O. Box 385, Prospect, KY 40059.**

Binders are $13.50 per two-binder set plus $2.50 shipping and handling. If your order is to be sent via U.S. mail to a post office box or foreign country, please add $2. Kentucky residents add 5% sales tax. U.S. currency only, please. In order to hold down non-editorial costs, we do not bill.

For credit card orders call (800) 847-0309, 8 a.m. to 5 p.m. EST

All other inquiries call (502) 228-4492.

## COCO NEWSROOM

An excellent Desktop Publishing program for the CoCo 3. Design your own newspaper with Banner Headlines/6 Articles using sophisticated Graphics,Fonts & Fill patterns. Comes with 22 fonts & 50 pictures! Over 140K of code. Compatible with Epson, Gemini & Compatibles, DMP 105/106/110/120/130/200/400/420/500/2110, CGP-220, Laser LP1000 & IBM Compatibles. "*... a smash for CoCo 3 ...*" - *March 88 Rainbow Review.* Comes on 3 non copy-protected disks. Only **$49.95**

Create distinctive bright yellow diamond shaped car signs. Includes 2 resuable clear plastic sign holders with suction cups, and 50 sheets of bright yellow fanfold paper. Printer Requirements are the same as for the CoCo Graphics Designer. Only **$29.95**

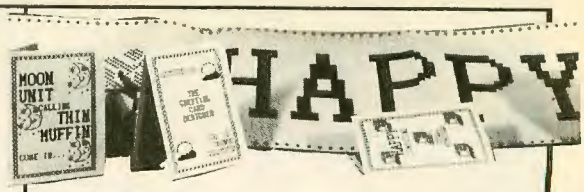
## COLOR SCHEMATIC DESIGNER

By Prakash Mishra

An excellent Circuit Schematic Design Software Package for CoCo 3. Features:

- **Runs in 640x192 at 1.8 Mhz**
- **Pull Down Menus**
- **Keyboard/Mouse/Joystck Support**
- **RGB/ Composite/Monochrome Monitor Support**
- **72 Modifiable Symbols**
- **Multiple Hi-Res Fonts**
- **Multiple UNDO Command**
- **Symbol Rotate/Line/Box Draw**
- **Supports 3 Layers of Circuits**
- **Powerful Screen Print Command for DMP/Gemini/Epson Printers**
- **Complete Documentation**

*Only $39.95*




## COCO GRAPHICS DESIGNER

Create beautiful **Greeting Cards, Signs & Banners** for holidays, parties and other occasions. Comes with a library of pre-drawn pictures. Includes utilities to create your own character sets, borders and graphic pictures. Requires CoCo 1,2,3 or TDP-100 with a min. of 32K, one Disk Drive and a Printer. Compatible with Disk Basic 1.0/1.1/2.0/2.1, ADOS(3) and JDOS. Supports the following printers: DMP 100/105/106/ 110/130/ 430; CGP220, EPSON RX/FX, GEMINI 10X, SG-10, NX-10/1000 & OKIDATA. Latest Version! DISK Only **$29.95**

**PICTURE DISK #1,#2,#3,#4:** Each picture disk contains over 100 pictures !! Disk **$14.95** each. ALL 4 Picture Disks: **$54.95**

**FONT DISK #1,#2,A,B:** Each disk contains 10 extra fonts!! Disk **$19.95** each. Buy any 3 Font Disks and get the 4th FREE!!

**COLORED PAPER PACK (with matching envelopes): $24.95**

## GAMES

(Disk only)
(CoCo 1,2 & 3 except where mentioned)

**WILD WEST** (CoCo 3 Only): $24.95
**VEGAS SLOTS**(CoCo 3 only): $29.95
**VEGAS GAME PACK:** $24.95
**FLIGHT 16**: $34.95
**P-51 MUSTANG SIMULATION:** $34.95
**WORLDS OF FLIGHT**: $34.95
**PYRAMIX**(Cubix for CoCo 3): $24.95
**KUNG FU DUDE:** $24.95 **CHAMPION**: $19.95
**WHITE FIRE OF ETERNITY**: $19.95
**IN QUEST OF STAR LORD**(Animated Graphics Adventure for CoCo 3): $34.95
**TREASURY PACK#1:** Lunar Rover Patrol, Cubix, Declathon, Qix, keys of Wizard, Module Man, Pengon, Space Wreck & Roller Controller.Only $29.95
**TREASURY PACK #2**: Lancer, Ms. Gobbler, Froggie, Madness & Minotaur, Ice Castles, Galagon, Devious and Syzygy. Only $29.95
**SPACE PAC**: Color Zap, Invaders, Planet Invasion, Space Race, Space War, Galax Attax, Anaroid Attack, Whirlybird, Space Sentry & Storm Arrows.Only $29.95
**WIZARD'S CASTLE**: A hi-res graphics adventure game filled with traps, tricks, treasures. Only $19.95

## XENOCOPY-PC

NEW

An amazingly versatile program that allows you to Format/Duplicate / Read/ Write disks from over 300 different computers. For example you could transfer programs between CoCo, IBM, PC-DOS, TRS-80 Model 3, TRS-80 Model 4, TRS-80 Model 100, Xerox 820, Zenith, Kaypro II, Novell, NEC DOS and much much more!! Send for FREE List. Requires an IBM Compatible with 2 drives. Disk $79.95.

## 512K BACKUP LIGHTNING

NEW

The ultimate CoCo 3 disk copying utility!! Reads your master diskette once and then makes as many copies as you want. It automatically formats an unformatted disk while copying! Supports 35, 40 or 80 track drives with various step rates. A must for any disk user!! Only $19.95

## PRINTER LIGHTNING

Never wait for your printer again!! This Print Spooler allows you to print to your printer and simultaneously continue with your programming. No need to wait for those long printouts! Disk Only $19.95

## BASIC FREEDOM

NEW

A Full Screen Editor for Basic Programs!! A Must for anyone who writes Basic Programs. Only $24.95

## VOCAL FREEDOM

Turn your computer into a digital voice / sound recorder. Produces natural voices/ sound effects. Req. inexpensive RS Amplifier (#277-1008) & any microphone. Only $34.95

## HACKER's PAC

Allows you to incorporate voices created by Vocal Freedom into your own Basic and ML programs. Only $14.95

**MICROCOM SOFTWARE** 2900 Monroe Ave, Rochester,NY 14618. Ph: (716) 383-8830

**All orders $50 & above shipped by UPS 2nd Day Air at no extra charge within US.** We accept Visa, MasterCard, Amex, Check or MO. Sorry, no CODs. Please add $3 S&H (USA/CANADA); except where specified otherwise; Foreign 10% S&H(minimum $5). New York State residents please add sales tax. Looking for new software/hardware.

**To Place Credit Card Orders Call Toll Free 1-800-654-5244 9am-8pm Monday-Saturday**

Order Status, Information, Technical Information, call 716-383-8830

# Still pounding away at that keyboard?

## Save Time and Money with a Combination Subscription!

## SAVE up to 19%

when you buy a joint subscription to the magazine and either RAINBOW ON TAPE or RAINBOW ON DISK! A one-year subscription to THE RAINBOW and RAINBOW ON TAPE is only $91 in the U.S., $108 in Canada, $153 foreign surface rate and $188 foreign airmail. A one-year subscription to THE RAINBOW and RAINBOW ON DISK is only $115 in the U.S., $138 in Canada, $183 foreign surface rate and $218 foreign airmail.*

Every month, these convenient services bring you as many as 24 ready-to-run programs. Using the current issue of THE RAINBOW as documentation, all you have to do is load and run them. A one-year combination subscription to THE RAINBOW and RAINBOW ON TAPE or RAINBOW ON DISK give you more than 230 new programs! The typing time you save can be spent enjoying your CoCo!

### RAINBOW ON TAPE For No-Fuss Fun

Back issues of RAINBOW ON TAPE are available beginning with the April 1982 issue. A single copy of RAINBOW ON TAPE is $10 within the United States; U.S. $12 in all other countries. The annual subscription rate for RAINBOW ON TAPE is $80 within the U.S.; U.S. $90 in Canada; and U.S. $105 for all other countries.*

### RAINBOW ON DISK Offers OS-9 Programs

In addition to all the programs offered on tape, part of one side of RAINBOW ON DISK is formatted for the OS-9 operating system. That means you can now get all the OS-9 programs from the magazine — programs that cannot be put on tape. Back issues of RAINBOW ON DISK are available beginning with October 1986. Subscriptions to RAINBOW ON DISK are $99 a year in the U.S. Canadian rate is U.S. $115. All other countries, U.S. $130. Single copy rate is $12 in the U.S.; U.S. $14 in Canada; and U.S. $16 in all other countries.*

**To order by phone (*credit card orders only*), call (800) 847-0309, 8 a.m. to 5 p.m. EST. All other inquiries call (502) 228-4492.**

**Look for our envelope located between pages 66 and 67 for ordering individual subscriptions to THE RAINBOW, RAINBOW ON TAPE and RAINBOW ON DISK.**

**YES! Sign me up for a joint 1-year subscription (12 issues) to:**

☐ **THE RAINBOW and RAINBOW ON TAPE**
☐ **THE RAINBOW and RAINBOW ON DISK**
☐ **NEW** ☐ **RENEWAL** (attach labels)

**Name** _____
**Address** _____
**City** _____ **State** _____ **ZIP** _____

**Payment Enclosed** ☐ **(*payment must accompany order)**
**Charge:** ☐ **VISA** ☐ **MasterCard** ☐ **Am. Express**
**Account Number** _____
**Signature** _____ **Exp.** _____

*U.S. currency only, please. In order to hold down costs, we do not bill. Kentucky residents add 5% sales tax. Please allow 6 to 8 weeks for delivery of first copies. Joint subscriptions to THE RAINBOW and RAINBOW ON TAPE or RAINBOW ON DISK begin with the current issue.

**Please note:** While group purchases of RAINBOW ON TAPE and RAINBOW ON DISK are permitted (and multiple subscriptions are even discounted, if purchased in one order from a club), no license to make copies is conveyed or implied. Yes, your group may even purchase a subscription to our disk/tape services, but such purchase in no way authorizes that *any* copies be made of that original disk/tape. Specifically, this means that the original disk/tape itself may indeed be kept in a club library for use by members. However, a group purchase *does not* entitle club members, individually or as a group, to copy that disk/tape.

Unauthorized copying of any copyright product is strictly illegal. The copyright (right to make copies) is in no way conveyed in the purchase transaction.

# COCO 3 UTILITIES GALORE

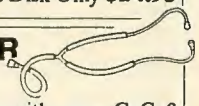
*(CoCo 2 Versions Included where specified)*

## SUPER TAPE/DISK TRANSFER

* Disk-to-Disk Copy * Tape-to-Disk Copy
* Tape-to-Disk Auto Relocate
* Disk-to-Tape Copy * Tape-to-Tape Copy

Copies Basic/ML/Data Files. CoCo 1,2 or 3. Req. min. 64K Disk System. Disk Only **$24.95**

## COCO CHECKER



Something possibly wrong with your CoCo? CoCo Checker is the answer. Will test your ROMs, RAMs, Disk Drives & Controller, Printer, Keyboard, Cassette, Joysticks, Sound, PIAs, VDG, Internal Clock Speed, Multi-Pak Interface and more! Only **$24.95**

## DISK UTILITY 2.1A

A multi-featured tool for USER FRIENDLY disk handling. Utilize a directory window to selectively sort, move, rename & kill file entries. Lightning fast Disk I/O for format, copy & back-up. Single key execution of Basic/ML programs. This will become your MOST USED program !! CoCo 1,2 or 3. Req. Min. 64K. Disk Only **$24.95**

## MAILLIST PRO

The ultimate mailing list program. Allows you to add, edit, view, delete, change, sort (by zip-code or name) and print labels. Its indispensible!! Disk **$19.95** (CoCo 2 version included)

## DISK LABEL MAKER

Allows you to design professional disk labels! Allows elongated, normal and condensed format for text. Double Strike, Border Creation, and multiple label printing. Its a MUST for any user with a disk drive. Supports DMP 105/106/110/120/ 130/430, GEMINI, STAR, EPSON and compatibles. (CoCo 2 version included). Only **$19.95**

## COCO UTIL II

(Latest Version): Transfer CoCo Disk files to IBM compatible computer and vica-versa. Requires 2-Drive IBM Compatible. Disk **$39.95**

## RGB PATCH

Displays most games in color on RGB monitors. CoCo 3 Disk **$24.95**

## COMPUTERIZED CHECKBOOK

Why bother with balancing your checkbook? Let the CoCo do it for you. Allows you to add, view, search, edit, change, delete and printout (in a table/individual entry format) checkbook entries. Updates balance after each entry. Allows files for checking, savings, and other accounts. Disk **$19.95.** (CoCo 2 version included)

## BOWLING SCORE KEEPER

An excellent utility to keep track of your bowling scores. Allows you to save scores under individuals or teams. You can edit change, delete, and compare scores. A must for anyone who wants to keep track of his or her bowling performance. Disk $19.95 (CoCo 2 version included)

## VCR TAPE ORGANIZER

Organize your videotapes with this program. Allows you to index tapes by title, rating, type, play time and comments. Also allows you to sort titles alphabetically & view/print selected tapes. If you own a VCR, this program is a MUST!! Disk $19.95 (CoCo 2 version included)

## COCO 3 SCREEN DUMP

Fantastic

32, 40, 80 column text dump, PMODE 4 Graphics Dump. Single Keystroke Operation allows you to take snapshots of your screens even when programs are running! Works on DMP's, Epson, Gemini and compatibles. CoCo 1, 2 and 3. Disk **$24.95**

## HOME BILL MANAGER

Let the CoCo keep track of your bills. Allows you to enter bills under various categories and reminds you when they are due. Disk **$19.95**

## CALENDAR MAKER

Generate monthly calendars on your printer for any year in the 20th century. Disk Only **$19.95** (CoCo 2 version included)

## ADOS 3

Advanced disk operating system for CoCo 3. Comes on disk and is EPROMable!! Disk **$34.95.** ADOS (for CoCo 1,2): **$27.95**

# OS 9

## OS9 LEVEL II OPERATING SYSTEM

Supports 512K RAM dual speed, multi-tasking, multiple windows, and more!! Comes with disk and complete documentation. Only **$89.95**

## MULTI-VUE

User friendly graphics interface with multiple "window" applications for Level II. Only **$54.95**

## WIZ

OS9 Level II Terminal Package with 300-19200 baud rate and windowing capability. Requires 512K and RS-232 Pack. Only **$79.95**

## DYNASTAR

Best OS9 Editor/Word Processor Text Formatter. Has Keyboard Macros, supports terminals & windows simultaneously, configurable, auto-indent for C/Pascal programming, mail-merge. New Manual makes it easier than ever. Only **$149.95. DynaSpell $49.95. Both Dynastar and Dynaspell: Only $174.95**

## DYNACALC OS-9

Excellent spreadsheet for OS-9 users. Only **$99.95**

## OS9 LEVEL II BBS

NEW

BBS program that supports multiple users and sysop definable menus. Includes the following: Tsmon, Login, Chat, Message Retrieval, Mail Retrieval, Uloadx, Dloadx, and much more! Req. 512K. Only **$29.95**

## PC-Xfer UTILITIES

Programs to format and transfer files to/from MS DOS diskettes on CoCo Under OS9 Level 1 and 2. Requires SDISK or SDISK 3. Only **$44.95**

## SDISK 3

Standard disk drive module replacement allows full use of 40/80 track double-sided drives. Req. OS9 Level II. Only **$29.95. SDISK: $29.95**

## OS9 LEVEL II RAMDISK

Lightning Fast Ramdisk with Auto-Formatting. A must for any OS9 Level II user. Req 512K. Only **$29.95**

## OS9 BOOKS:

Inside OS9 Level II: **$39.95**
Rainbow Guide to OS9 II: **$19.95**
Rainbow Guide to OS9 II Disk: **$19.95**

*OS9 Reference Card: FREE with any OS9 Purchase!!!*

**MICROCOM SOFTWARE** 2900 Monroe Ave, Rochester,NY 14618. Ph: (716) 383-8830

VISA MasterCard AMERICAN EXPRESS DISCOVER

**All orders $50 & above shipped by UPS 2nd Day Air at no extra charge within US.** We accept Visa, MasterCard, Amex, Check or MO. Sorry, no CODs. Please add $3 S&H (USA/CANADA); except where specified otherwise; Foreign 10% S&H(minimum $5). New York State residents please add sales tax. Looking for new software/hardware.

**To Place Credit Card Orders Call Toll Free 1-800-654-5244 9am-8pm Monday-Saturday**

Order Status, Information, Technical Information, call 716-383-8830

Obviously, I did not "get tired" of my computer. The reason is a very simple one — and it really relates to the complaint my friend had when he first saw my first computer. Our computers, all of them, are really nothing more than empty boxes waiting to be filled with whatever we are interested in.

That is the secret, of course.

No matter what your interest, you can "fill up" your Tandy computer with information about it. Art and words, data (read that information of any kind) and communications — whatever it is, you have the empty box right there, and you can fill it to the brim with your own interests.

I have heard literally hundreds of stories over the years from people who bought a computer for one single reason or another — to balance a checkbook, to play games, to write letters — and found that simply and easily, just by adding another program, they could make it do all of those things and so much more.

I think my favorite recreational use of the computer is using my desktop publishing program to create little "newspapers" celebrating one event or another in the lives of my family and friends.

***"Our computers are really nothing more than empty boxes waiting to be filled with whatever we are interested in."***

When the friend I mentioned at the start of this column turned 45, I did a special "newspaper" for him — all about him. When my daughter was married a few months back, there was another. Other events have been "celebrated" in the same way.

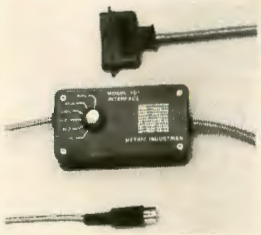
For me, these are creative and fun. But the nicest thing of all is that doing just them would never justify the expense of a computer. So, at home, I also play some games, keep track of expenses, have files of all my books and do a myriad of other things. Yes, interest in this or that will flag, but, remember, the computer is just an empty box waiting for me to fill it up.

I know most of you know this. But I am sure you have friends who do not. Do them each a favor. Tell them to buy computers as presents to themselves next month.

And, yes, tell them to get that Color Computer from Tandy. Because, as time has proven, there really is no better value.

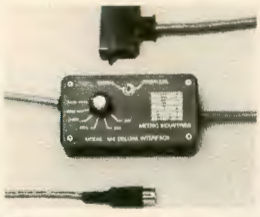
**— Lonnie Falk**


# METRIC INDUSTRIES, INC.



## Model 101
## Serial to Parallel Printer Interface

- ★ Works with any COCO
- ★ Compatible with "Centronics" Parallel Input Printers
- ★ Just turn the knob to select any one of 6 baud rates 300-9600
- ★ Comes complete with cables to connect to your printer and computer
- ★ Can be powered by most printers



## Model 104 Deluxe Interface with "Modem Switch"

- ★ **Same Features as 101 Plus**
- ★ Built in Serial Port for your Modem or other serial device
- ★ Switch between Serial Output and Parallel Output
- ★ Comes with cables to connect to your computer and printer
- ★ Can be powered by most printers

## Model 105 Serial Switch

- ★ Connects to your COCO to give you 2 switch selectable Serial Ports
- ★ Comes with a 3 foot cable to connect to your computer
- ★ Now you can connect your Printer (or printer interface) and your Modem (or other serial device) to your COCO and flip the switch to use either device
- ★ Does not require power

## Cassette Label Printing Program

- ★ **New Version 2.1 prints 7 lines** of information on Cassette labels
- ★ Comes on Tape with instructions to transfer to disk
- ★ Menu driven, very easy to use
- ★ **Save and Load Labels from Tape and Disk**
- ★ Uses the features of your printer to print standard, expanded, and condensed characters
- ★ **Automatically Centers Each Line of Text**
- ★ Allows editing of label before printing
- ★ Program comes with 24 labels to get you started
- ★ 16K ECB required

**Some of the Printers That Can –**
Supply power for the 101 and 104 are Radio Shack, Star, Okidata, Brother, Juki, and Smith Corona.

**Some of the Printers That Cannot –**
Supply power for the interfaces are Epson, Seikosha, Panasonic, Silver Reed and NEC. If your printer cannot supply power to the interface you can order your interface with the "P" option or you can supply your own AC adapter. We recommend the Radio Shack 273-1431 AC adapter with a 274-328 connector adapter.

**Write or call for more information or for technical assistance.**

## Price List

| | |
|---|---|
| **Model 101** | **35.95** |
| Model 101P | 41.95 |
| Model 104 | 44.95 |
| Model 104P | 51.95 |
| Model 105 | 14.95 |
| Cassette Label Program | 6.95 |
| Pin Feed Cassette Labels: | |
| White | 3.00/100 |
| Colors (specify) Red-Blue-Yellow-Tan | 3.60/C |

**4 Pin Din Serial COCO Cables:**

| | |
|---|---|
| Male/Male 6 foot | 4.49 |
| Male/Female 6 foot | 4.49 |
| Female/Female 6 foot | 4.49 |

Other Lengths Available.

**All items covered by a 1 year warranty**

## Ordering Info

- ★ **Free Shipping** in the U.S.A. (except AK and HI) on all orders over $50
- ★ On orders under $50 please add $2.50 for shipping and handling
- ★ On orders outside the U.S.A. please write or call for shipping charges

**You Can Pay By:**
- ★ VISA or MasterCard
- ★ C.O.D. - add $2.25
- ★ Or send check or money order payable in U.S. funds

**Metric Industries Inc.**
**P.O. Box 42396**
**Cincinnati, OH 45242**

**(513) 677-0796**

# Books That Can Launch A 1000 Programs!!

**Pokes, Peeks and Execs** are your guides into the jungle of computer programming. These commands give you the power of Machine Language without leaving the security of BASIC. Each book is a collection of "inside" information, with explanations and examples to help you immediately put it to use. Everyone from the novice to the professional will find these handy books a wealth of information.

## 300 POKES, PEEKS, 'N EXECS for COCO III

*40/80 column Screen Text Dump
*Save Text/Graphics Screen to Disk
*Command/Functions Disables
*Enhancements for CoCo3 BASIC
*128K/512K RAM Test Program
*HPRINT Character Modifier

Only *$19.95*

## 500 POKES PEEKS,'N EXECS

*Autostart your BASIC programs
*Disable Color BASIC/ECB/Disk BASIC commands
*Disable Break Key/ Clear Key/ Reset Button
*Generate a Repeat-key
*Transfer ROMPAKs to tape
*Set 23 different GRAPHIC modes
*Merge two BASIC programs
*And much much more!!!

For CoCo 1,2 and 3. Only *$16.95*

**ALL 3 BOOKS for $39.95**

## SUPPLEMENT TO 500 POKES,PEEKS, 'N EXECS

200 additional Pokes,Peeks and Execs (500 Pokes Peeks 'N Execs is a prerequisite)
*ROMPAK transfer to disk
*PAINT with 65000 styles
*Use of 40 track single/double sided drives
*High-speed Cassette Operation
*Telewriter, EDTASM+ CoCo Max enhancements
* Graphics Dump (for DMP printers) /Text Screen Dump

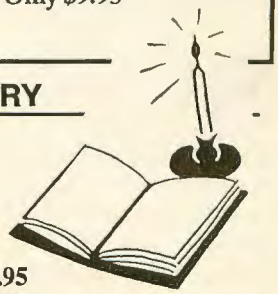
For CoCo 1,2 or 3. Only *$9.95*

## UNRAVELLED SERIES

An invaluable aid for Basic and Machine Language programmers, these books provide a complete disassembly and annotated listing of the BASIC/ECB and Disk ROMs. These listings give complete, uninterupted memory maps of the four ROMs. Gain complete control over all versions of the color computer.

**EXTENDED COLOR BASIC UNRAVELLED**: COLOR BASIC and EXTENDED BASIC ROM Disassembly: **$39.95**
**DISK BASIC UNRAVELLED**: DISK BASIC ROM 1.1 and 1.0 Disassembly : **$19.95**
**BOTH ECB AND DISK BASIC UNRAVELLED: $49.95**
**SUPER EXTENDED BASIC UNRAVELLED:** SUPER EXTENDED BASIC ROM Disassembly for CoCo 3. **$24.95**
**COMPLETE UNRAVELLED SERIES (all 3 books): $59.95**

## COCO LIBRARY



CoCo 3 Service Manual: **$39.95**
CoCo 2 Service Manual: **$29.95**
Inside OS9 Level II: **$39.95**
Rainbow Guide To OS9 Level II: **$19.95**
Rainbow Guide To OS9 II (disk): **$19.95**
Complete Guide To OS9 (Level 1): **$19.95**
Complete Guide To OS9 (2 Disk): **$29.95**
CoCo 3 Secrets Revealed: **$19.95**
Basic Programming Tricks: **$12.95**
Assembly Language Programming(tepco): **$18**
Addendum For CoCo3 (tepco): **$12**
Color Computer Disk Manual (with ref card): **$29.95**

## OTHER SOFTWARE ...

**COCO MAX III** (with hi-res interface): **$79.95**
**COCO MAX II:** Disk **$77.95** Tape **$67.95**
**MAXFONTS** #1,.#2,#3,#4: Disk **$19.95** Each
**CGP-220 Driver Kit** For CoCo Max III: **$19.95**
**MAXPATCH**: Run COCO MAX II on COCO 3. **$24.95**

**TELEWRITER 64** (COCO 1&2) :Disk **$57.95** Tape **$47.95**
**TW-80**: COCO3 features for TW-64 Disk **$39.95**
**TELEFORM**: Mailmerge/form letters for TW-64 Disk **$19.95**

**AUTOTERM**:Universal modem software Disk **$39.95** Cas **$29.95**

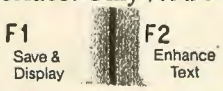
**PRO-COLOR FILE *ENHANCED***: Multi-feature Database **$59.95**
**PRO-COLOR FORM & DIR**: Forms/directories for PCF. **$24.95 SIDEWISE:** Print ASCII files sideways **$24.95**

**EDT/ASM 64D**: Editor-assembler (specify 1,2,3) **$59.95**
**SOURCE**: CoCo Disassembler **$34.95 SOURCE III: $49.95**
**CBASIC**: Best Basic compiler **$149.95 CBASIC III: $149.95**

## WINDOW MASTER

The hottest program for your CoCo 3!! Imagine using Windows, Pull-Down Menus, Buttons, Icons, Edit Field, and Mouse Functions in your Basic Programs. No need to use OS9. It uses the 640x255 (or 320x255) hires graphics mode for the highest resolution. Up to 31 windows can appear on the screen at one time. Need extra character sets? Window Master supports 5 fonts in 54 sizes! How about an enhanced Editor for Basic? It gives you a superb Basic Editor which leaves the standard EDIT command in the cold. And don't forget that many existing Basic/ML programs will operate under Window Master with little or no changes. In fact, it does NOT take up any memory from Basic. Requires 1 Disk Drive, RS Hi-res Interface & Joystick or Mouse. Specify 128K/512K. **$69. 95** Window Master & Hi-Res Interface. Only **$79.95**

## FUNCTION KEYS




Use F1,F2, ALT, CTRL Keys on your CoCo 3!!! If you program in Basic, this program is a must! Only **$14.95**

*Looking For New Software* . If you have a Basic or ML program which you would like to market, contact us! We pay excellent royalties!!!

**MICROCOM SOFTWARE** 2900 Monroe Ave, Rochester,NY 14618. Ph: (716) 383-8830

**All orders $50 & above shipped by UPS 2nd Day Air at no extra charge within US.** We accept Visa, MasterCard, Amex, Check or MO. Sorry, no CODs. Please add $3 S&H (USA/CANADA); except where specified otherwise; Foreign 10% S&H(minimum $5). New York State residents please add sales tax. Looking for new software/hardware.

**To Place Credit Card Orders Call Toll Free 1-800-654-5244 9am-8pm Monday-Saturday**
Order Status, Information, Technical Information, call 716-383-8830

*Modifying the CoBBS system to work with the CoCo 3*

# A CoBBS Update

## By Kevin Sloan

Since 1985 many Color Bulletin Board Systems have been in use. When Tandy introduced the Color Computer 3 in mid-1986, many of the people who had been running *CoBBS* on their CoCo 2s upgraded to the more powerful CoCo 3, only to find out that their bulletin boards wouldn't work.

The incompatibility lies in the new interrupt structure. Since memory in the CoCo 3 can be "moved" with the memory management unit, an additional interrupt service was added to keep the machine from performing an interrupt to an area of memory that had been moved. For instance, when you do an HSCREEN2, memory at $60000 to $67FFF is moved into the CPU (central processing unit) address space of $2000 to $9FFF. If the IRQ (the interrupt that keeps the time on the timer function and in the software clock of *Coterm*) is serviced while the Hi-Res screen memory is in this location, BASIC crashes. Therefore, the initial interrupts were changed to point to $FEEE instead of $100.

The software clock in *Coterm* is the specific culprit. It pulls the IRQ address from $FFF8 and $FFF9 and tries to put its "detour" into $FEF8 and $FEF9 (where $FFF8 and $FFF9 point). The result is a foregone conclusion — the computer will crash and lock up.

The fix is very simple, and all changes that follow are to the original *CoBBS* system series appearing in THE RAINBOW from November 1985 to February 1986. To fix the software clock, just put these three pokes in STARTUP right after *Coterm* is loaded from disk:

```
71 POKE &HF78, &H8E
72 POKE &HF79, &H01
73 POKE &HF7A, &H0C
```

The software clock in *Coterm* can now be used with the CoCo 3 as it would be normally with the CoCo 1 or 2.

But that's not all you must do to get *CoBBS* working. You need to remove the useless Error Trapper, since the CoCo 3 has that built in. To ensure that it is not poked into memory, delete the GOTO 250 in Line 210 in STARTUP:

```
210 FOR A=&H10D5 TO &H10D7:POKE
A,&H12:NEXT A
```

Next, all of the RUNTs need to be changed to ON ERR GOTO. Here is a list of the line numbers in USER/SYS and COBBS/SYS where they can be located:

USER/SYS lines:
10, 20, 61, 64, 66, 68, 70, 80, 110, 180, 210, 305, 365, 371, 410, 415, 420, 430, 510, 905, 980, 7025, 7030, 8005, 9005 and 9610.

COBBS/SYS lines:
9, 11, 70, 405, 555, 604, 655, 1005, 1190, 1205, 1215, 1226, 1228, 1235, 1245, 1255 (two changes), 1275, 1290, 1310, 1340, 1342, 1345, 1375, 7025, 7030, 7040, 7041, 7060, 9615 and 9810

An easier way to do this is to save USER/SYS and COBBS/SYS as ASCII files. Then load them up in a word processor and do a universal change of RUNT and RUN T to ON ERR GOTO (*Disk Color Scripsit* doesn't work very well because of its buffer size).

The error-trap processing needs to be upgraded to work with the CoCo 3's new commands as well. Make the following changes: In USER/SYS, delete lines 915, 920, 925, 930 and 935. Then retype Line 935 to read:

```
935 ER$="**Error: Type"+STR$
(ERNO)+" inLine"+STR$(ERLIN)
+":User"
```

In COBBS/SYS delete lines 1180, 1181, 1182, 1183 and 1185. Retype Line 1185 to read:

```
1185 ER$=CHR$(13)+"*ERROR"+
STR$(ERNO)+" IN LN"+STR$
(ERLIN)+"*":GOSUB870:
PRINTER$:GOSUB9615:TR$=
STRING$(32,"+")+CHR$(13)
+ER$+CHR$(13): GOSUB9600
```

To take advantage of your CoCo 3's Hi-Res text screens. Make the following changes to USER/SYS:

Add Line 6: `6 WIDTH32: PALETTE 13,0: Palette 12,63`

Change the CLS0 to CLS in Line 34:

```
34 II=TIMER:IFII>19999AND
PEEK(4694)<>0THEN CLS:IFII
>60000THEN TIMER=20000
```

Insert `WIDTH40:PALETTE8,63:CLS3:` in Line 40:

```
40 WIDTH40:PALETTE8,63:CLS3:
EXEC&H10DA:POKE4657,0
```

Insert `WIDTH40:PALETTE8,63:CLS3:` in Line 66:

```
66WIDTH40:PALETTE8,63:CLS3:
GOSUB9000:IFK1=0THEN67ELSEGET
#1,1:RE=CVN(H1$):GET#1,2:RS
=CVN(H1$):CLOSE
```

Now your *CoBBS* system should work on your CoCo 3. I will be happy to help you with this upgrade. My bulletin board runs from 10 p.m. CST to 1 p.m. CST of the next day Monday through Friday, or I'll put the system up at any other time upon request. Just call at 300 bps, 7 bits, one stop bit, 601-693-8092.

Editor's Note: The modified COBBS/SYS and USER/SYS files are included on this month's RAINBOW ON TAPE and DISK.

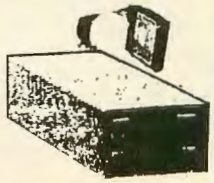
*(Questions or comments concerning this upgrade may also be addressed to the author at 3228 11th Place, Meridian, MS 39305. Please enclose an SASE when requesting a reply.)*

---

*Kevin Sloan, a computer operator and programmer by profession, has been using the CoCo for five years and is a very active member of his local user group.*

## DISK DRIVES

**New** Double-Sided Double-Density 360K 40-Track 1/2 ht drives for CoCo 2 & 3. These are the same quality drives that are used in IBM® compatible computers. Buy from someone else and all you get is a disk drive. Buy from us and not only do you get a quality drive but $50 of Free Disk Utility Software (Super Tape/Disk Transfer & Disk Utility 2.1A) and our DISKMAX utility which allows you to access BOTH sides of our drives. It's like buying TWO drives for the price of ONE!! 90-day warranty on all drives!



**Drive 0** (With **Disto Super Controller!**, Case, Power Supply & Cable):**$229.95** **Drive 1: $149.95**
**TWO 1/2 ht Drives** in one case with Cable, Case & Disto Controller:**$339.95** **Bare Drive: $89**
J & M Controller (with RSDOS): **$79.95** 1 Drive Cable:**$19.95** 2 Drive Cable: **$24.95** 4 Drive Cable: **$39.95**
DISTO Super Controller: **$99.95** DISTO Super Controller II: **$129.95**
**Add Ons:** Mini Eprom Prog.: $54.95 RT Clock/Parallel Interface: $39.95 Hard Disk Interface: $49.95 Multi-Board Adapter: $59.95

## HARD DRIVE SYSTEMS

Complete w/Hard Drive, WD Controller, B&B Interface, Cables, Case, Power Supply, Software (OS9/Basic) & Instruction Manual. Assembled/ tested/ formatted. Just *Plug'n'Run!!* Multipak Req.
**Seagate 20 Meg System: $509** Best Hard
**Seagate 30 Meg System: $539** Drive Deal

## HARD DRIVE INTERFACES

**CoCo XT:** Use 2 5-120 Meg Drives with CoCo. **$69.95. w/Real Time Clock: $99.95**
**Hyper IO:** Allows Hard Drive use with RSDOS. Only **$29.95**
**CoCo XT ROM:** Boots OS9 from Hard/Floppy Drives. Only **$19.95**
(Multipak Required for Interface)

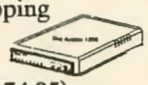
Add $10 S&H for Drives

## RS232 SUPER PACK

Here it is! True RS232 port for your CoCo. Compatible with **Tandy ® Deluxe RS232 Pack!** Includes DB25 Cable. Req. Multipak. From DISTO so you know its quality! Going fast!
Only **$54.95** (CoCo 1,2 or 3)

## COMMUNICATIONS EXTRAVAGANZA

1) **AVATEX 1200e MODEM:** Fully Hayes compatible 300/1200 w/ speaker, Auto-Dial/Answer/Redial (Reg $109.95)
2) **MODEM CABLE:** 4 pin to DB25. (Reg $19.95)
3) **AUTOTERM TERMINAL SOFTWARE** (Reg $39.95)
4) **FREE COMPUSERVE OFFER** and Access Time
5) UPS **2nd DAY AIR** Shipping ONLY **$149.95**



(With AVATEX 1200hc instead of Avatex 1200e: **$174.95**) with **AVATEX 2400: $249.95**

## MAGNAVOX 8CM515 RGB MONITOR

Razor-sharp picture quality for your CoCo! Has 14" screen, Analog/TTL RGB, Composite inputs for CoCo 2/3, Speaker, tilt-stand & 2 year warranty! With a push of a button you can go from RGB to composite mode. This means that ALL your CoCo programs that appear in B&W in RGB mode will appear in color!! Only **$265** (add $12 S&H US/$40 in Canada). **Magnavox** Cable for CoCo 3, Composite/Audio Cable with purchase of monitor: **$19.95**

## EPROM

**INTRONICS EPROM PROGRAMMER** (for CoCo): Programs 2516-27512 & more! Includes software and complete documentation. Latest Version. Lowest Price anywhere! **$137.95**
**EPROM ERASER:** Fast erase of 24/28 pin EPROMs. Only **$49.95**
**BOTH EPROM PROGRAMMER and ERASER: $179.95**
**EPROMS:** 2764-**$8** 27128-**$9** each
Call for other EPROMs
**ROMPAK** (w/Blank PC Board 27xx Series): **$12.95**
**BLANK CARTRIDGE (Disk Controller Size): Only $10.95**

## KEYBOARDS , ETC.

**KEYBOARD EXTENSION CABLE:** Move your keyboard away from the computer & type with ease. Use your existing keyboard with this cable or leave your present keyboard intact and use a second keyboard. Only **$39.95.**

**Cable with CoCo 2 Keyboard: $49.95**
**Cable with CoCo 3 Keyboard: $69.95**
**CoCo 3 Keyboard** (with free FUNCTION KEYS software value $14.95):**$39.95**
**CoCo 2 Keyboard: $19.95**

### NX-1000 Rainbow Printer

Fully Epson Compatible 7 Color Printer.

**Only $259**

## CABLES

**MAGNAVOX** 8505/8515/8CM643 Analog RGB Cable: **$24.95**
**SERIAL-TO-PARALLEL INTERFACE:** Use your parallel printer at high speed (300-9600 baud) with CoCo. Comes will all cables. No software compatibility problems. Only **$44.95**
**15" MULTIPAK/ROMPAK EXTENDER CABLE: $29.95**
**VIDEO DRIVER:** Use a monochrome/color monitor with your CoCo. Comes with audio/video cables. Specify CoCo 1 or 2. Excellent picture quality/resolution! **$34.95**
**RS232 Y CABLE:** Hook 2 Devices to the serial port. Only **$18.95**
**Y CABLE:** Use your disk system with Speech Pak,CoCo Max, DS69, etc. **$27.95**
**RGB Analog Extender Cable:$19.95**
**SONY Monitor Cable: $29.95**
**VIDEO CLEAR:**Reduce TV interference.**$19.95**
**MODEM CABLE:**4 pin to DB25.Only **$19.95**
**3-POSITION SWITCHER: $37.95**
**HI-RES JOYSTICK INTERFACE: $11.99**

## CHIPS, ETC

**Disk Basic Rom 1.1** (Needed for CoCo 3): **$29.95** **ECB ROM 1.1:$29.95**
**68B09E or 6809E Chip: $14.95**
**MultiPak PAL Chip** for CoCo 3: **$19.95**
**PAL Switcher:** Now you can switch between the CoCo 2 and 3 modes when using the Multi-Pak. You need the OLDER & NEW PAL chip for the 26-3024 Multipak. Only $39.95. With NEW PAL Chip: **$49.95.**
**5 1/4" Disks: $0.45 each!**

## UPGRADES

**512K Upgrades** for CoCo 3: **$CALL**
**64K Upgrade** for CoCo I's, CoCo II's with Cat #26-3026/27, 26-3134, 26-3136: **$29.95**
**64K Upgrade** for 26-3134 A/B CoCo II: **$39.95**
(Free 64K Utility Software incl. with 64K Upgr.)

**MICROCOM SOFTWARE** 2900 Monroe Ave, Rochester,NY 14618. Ph: (716) 383-8830

**All orders $50 & above (except drives, printers & monitors) shipped by UPS 2nd Day Air at no extra charge within US.** We accept Visa, MasterCard, Amex, Check or MO. Sorry, no CODs. Please add $3 S&H (USA/CANADA); except where specified otherwise; Foreign 10% S&H(minimum $5). New York State residents please add sales tax. Looking for new software/hardware.

**To Place Credit Card Orders Call Toll Free 1-800-654-5244 9am-8pm Monday-Saturday**
Order Status, Information, Technical Information, call 716-383-8830

# NEW REAL DESKTOP

# CoCo Max™ III AND

**CoCo Max III** is absolutely the best drawing package available for the CoCo 3, and it does more than just let you draw. **CoCo Max III** includes animation, text, color mixing and more features than you would think possible. It combines incredible speed with dazzling graphics and it is a joy to use even its most powerful features.

Pictures, graphs, flyers, cards, signs, school projects, labels, buttons and anything else you might dream of creating is now possible with **CoCo Max III**. Is it any wonder that the majority of CoCo Gallery pictures in the last five months were created with **CoCo Max?**

Thousands of CoCo users have found that you don't have to be an artist to have fun with **CoCo Max**. You'll wonder why you waited so long to get the incredible **CoCo Max III**.

**CoCo Max III** is the best because it includes:
– a huge picture area (*two* full hi-res 320x192 screens) – a large editing window – Zoom mode for detail work – 28 drawing tools which you just point and click on – shrink and stretch – rotation at any angle (1.5 degree steps) – 512K memory support (*all* features work with 128K too) – an Undo feature to correct mistakes – you can even Undo an "Undo" – Animation – special effects – color sequencing (8 colors, variable speed) – thirteen fonts (more available) – each font has eight different sizes – five style options (bold, italic, 3D, etc.) for thousands of font/size/style combination possibilities. – the CoCo Show "slide show" program – color editing of patterns – automatic pattern alignment – prints in single and double size – smart lasso (move text over a background...) – advanced tools: arc, ray, cube, etc. – select 16 of the 64 colors (all 64 colors are displayed at once for selection!) – picture converter (CoCo Max II, MGE, BASIC) – extensive prompting – "glyphic" clipbook of rubber stamps – double click shortcuts – color mixing (additive/subtractive/none) – money back guarantee – sophisticated data compression saves disk space – pull down menus (no commands to remember) – forty paintbrush shapes – two color lettering – spray can – scrapbooks of pictures – error free – Y-cable or multipack not required – high speed hi-res interface included (plugs into joystick port) – disk is not copy protected – amazing "flowbrush" – RGB and composite monitor support – replace color – printing on black and white printers in five shades of gray – full color printing with optional drivers for the NX-1000 Rainbow and CGP220 – entirely rewritten for the CoCo 3

*There are no limits to what you can do with this fabulous program. Speed, ease, animation, power and color, all in one package.* **CoCo Max III** *is the ultimate program for the CoCo 3.* –Rainbow review 4/88

## CoCo Max III: $79.95
**Max-10 owners: deduct $10**

**System Requirements:**
CoCo 3 disk system and a Joystick or Mouse

**Printer drivers included:**
IBM/Epson and compatibles, GEMINI, DMP105/106/130,OKI182/192, CGP220 (B&W), DMP110, DMP200

**Color printer drivers** (prints 125 different colors) Star NX-1000, CGP-220, or Okimate 20 each **$19.95**

## For all CoCo Max Versions
**Max Edit** Font Editor: A font is a set of characters of a particular style. With Max Edit you can create new fonts or modify the existing ones. **$19.95**

**Max Font** disks (send for list) each **$19.95**

**Max Font Set** (95 fonts on 4 disks) **$49.95**

**DS69/69B Digitizers:** allows you to capture the image from a VCR or video camera and bring it into your computer. CoCo Max will let you load digitized pictures and modify them.

**DS-69** (2 images per second. Requires multipak) **$99.95**

**DS-69B** (8 images/second) **$149.95**

## CoCo 1 & 2 Owners Still Available:
(See previous ads or write for information)

**CoCo Max II** (works on all disk CoCos) **$69.95**

**CoCo Max Tape** (CoCo 1 & 2 only) **$59.95**

**Y-Cable** **$24.95**

**CoCo Max II Picture Disk Set** set of 3 disks: **$29.95**

**Guaranteed Satisfaction**
Use CoCo Max or Max-10 for a full month. If you are not delighted with either of them, we will refund every penny.

**COLORWARE**
A division of Sigma Industries, Inc.

**TO ORDER**
**(203) 656-1806 MON-FRI 9 to 5 EST**
Visa or Mastercard accepted. C.O.D. orders $3 extra
Check or M.O. to: Colorware, 242-W West Ave, Darien CT 06820
Add $3 per order for shipping ($5 to Canada, 10% to overseas)
CT residents add 7.5% sales tax

# PUBLISHING

COLORWARE

# Max-10™

## THE DAZZLING WORD PROCESSOR

You probably already have a word processor, and you probably wish it had these features:

- Fully menu driven (CoCo Max style) with point and click marking of text. You don't need the arrow keys!
- True WYSIWYG (What You See Is What You Get) including variable size fonts, styles (bold, italics, etc.) and graphics.
- Can print multiple columns on a page.
- Not limited by printer capabilities: fonts up to 24 points (1/3") high, superscripts, small print, etc.
- Fully integrated spelling checker (incredibly fast), no need to exit program to check spelling.
- Graphics can be imported from just about anything (CoCo Max; MGE; BASIC; even Macintosh pictures from a BBS) and resized to fit your document.
- Full screen preview including graphics.

**Max–10** has all these unique features, plus all the features you are used to in your current word processor. Even with all this, you don't give up anything. **Max–10** is easier to use, more intuitive, faster and more powerful than anything else. It's not just a word processor, it's a desktop publisher.

**Max–10: $79.95**

**CoCo Max III owners: deduct $10**

**Max–10 requires** a CoCo 3, at least 1 disk, & joystick or mouse

**Printer drivers included:** IBM/Epson and compatibles; DMP 105, DMP106, DMP130; CGP220 (B&W); Gemini/Star

Some of the many features of **Max–10:**
– Blinding speed – printing in multiple columns – online dictionary – spell checking – graphics can be mixed with text – full justification of proportionally sized characters – bold, italic, underline superscript and subscript type styles – superb file support, just point and click – "Undo" lets you correct mistakes – easy to use, no commands to remember – any graphics program can be used – pictures can be shrunk or stretched to fit – right and left alignment – centering – variable line spacing – page numbering – current page number displayed on the screen – variable tab stops – left and right margins – tabs and margins can vary in the same document – cut and paste text and graphics anywhere in the file – page break shows on the screen – pull down menus are quick and simple to use – lightning fast access to any point in the document with the scroll box – twenty fonts (styles and sizes), more available – any number of character sizes and styles can be mixed on the same line – up to more than 120 characters per line, depending on font size, style and letters – headers and footers, even with graphics – file compatibility with other word processors – right, left, bottom and top margins – word wrap – set starting page – type ahead – key repeat – key click – scroll up and down – ASCII file output for compatibility – disk directory – kill files– block cut, copy and move – global search and replace – paragraph indent – clipboard – merge – show file (on disk) – free memory display – page count – paragraph count – word count – graphics can be resized and moved – multiple fonts – error recovery – true lowercase – 512K memory support (all features work with 128K too) – complete point and click cursor control – moving, clearing and changing blocks of text is ridiculously easy, just point and click at each end of the text block – onscreen ruler – preview file before loading – search and replace – disk is not copy protected – more than 35 pages of text

## CoCo Max III and Max–10 Perfect Together

You do not *need* **CoCo Max III** to insert and print graphics in **Max–10.** Max–10 works with any graphics creation program, and you can also use graphics downloaded from bulletin boards.

Similarly, you do not *need* **Max–10** to create graphics with text in **CoCo Max III.** There are tremendous lettering capabilities in **CoCo Max III,** with its many fonts, styles, and sizes.

Together **Max–10** and **CoCo Max III** are an unbeatable combination. This desktop publishing system is better than anything you've ever seen on a CoCo. We are so confident that you will use, and enjoy using the two software packages, that we offer an unconditional money back guarantee. Stop wasting your time and effort using inferior or obsolete products. Move up to the new generation of CoCo software now.

# DISCOVER A WORLD OF SOFTWARE

## In the New *EXPRESS ORDER Buyer's Guide.* *Over 850 programs...just a phone call away.*

Say hello to a new way to buy software. Express Order is the convenient new distribution system for today's most popular programs.

Choose from personal productivity, educational and entertainment programs for the Color Computer in our free 84-page guide. Then call our toll-free number and your software will be sent directly to you—freight prepaid!

Express Order is both convenient and affordable. Our prices are often 10 to 30% less than the manufacturer's suggested retail price.

Call anytime from 8 am to 10 pm (CST) for your free Express Order Buyer's Guide. Discover a world of software!

**Call today for your free copy.**

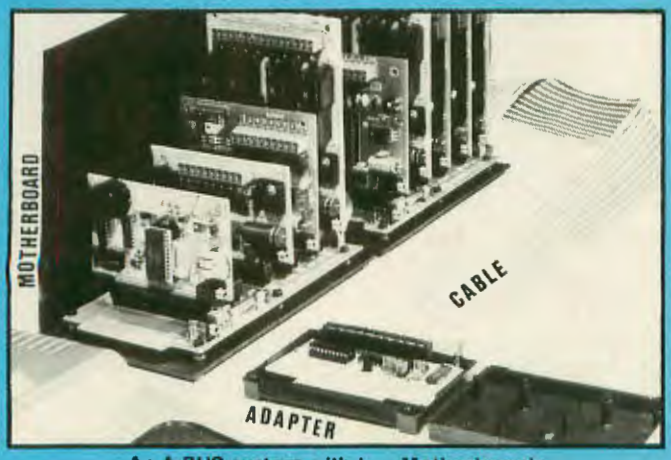
**1-800-321-3133**

EXPRESS ORDER℠

A DIVISION OF TANDY CORPORATION

# The Amazing A-BUS

NEW




**An A-BUS system with two Motherboards A-BUS adapter in foreground**

**The A-BUS system works with the original CoCo, the CoCo 2 and the CoCo 3.**

## Plug into the future

With the A-BUS you can plug your PC (IBM, Apple, TRS-80) into a future of exciting new applications in the fields of control, monitoring, automation, sensing, robotics, etc.

Alpha's modular A-BUS offers a proven method to build your "custom" system today. Tomorrow, when you are ready to take another step, you will be able to add more functions. This is ideal for first time experimenting and teaching.

A-BUS control can be entirely done in simple BASIC or Pascal, and no knowledge of electronics is required!

An A-BUS system consists of the A-BUS adapter plugged into your computer and a cable to connect the Adapter to 1 or 2 A-BUS cards. The same cable will also fit an A-BUS Motherboard for expansion up to 25 cards in any combination.

The A-BUS is backed by Alpha's continuing support (our 11th year, 50000 customers in over 60 countries).

The complete set of A-BUS User's Manuals is available for $10.

## About the A-BUS system:

- All the A-BUS cards are very easy to use with any language that can read or write to a Port or Memory. In BASIC, use INP and OUT (or PEEK and POKE with Apples and Tandy Color Computers)
- They are all compatible with each other. You can mix and match up to 25 cards to fit your application. Card addresses are easily set with jumpers.
- A-BUS cards are shipped with power supplies (except PD-123) and detailed manuals (including schematics and programming examples).

### Relay Card — RE-140: $129

Includes eight industrial relays. (3 amp contacts. SPST) individually controlled and latched. 8 LED's show status. Easy to use (OUT or POKE in BASIC). Card address is jumper selectable.

### Reed Relay Card — RE-156: $99

Same features as above, but uses 8 Reed Relays to switch low level signals (20mA max). Use as a channel selector, solid state relay driver, etc.

### Analog Input Card — AD-142: $129

Eight analog inputs. 0 to +5V range can be expanded to 100V by adding a resistor. 8 bit resolution (20mV). Conversion time 120us. Perfect to measure voltage, temperature, light levels, pressure, etc. Very easy to use.

### 12 Bit A/D Converter — AN-146: $139

This analog to digital converter is accurate to .025%. Input range is −4V to +4V. Resolution: 1 millivolt. The on board amplifier boosts signals up to 50 times to read microvolts. Conversion time is 130ms. Ideal for thermocouple, strain gauge, etc. 1 channel. (Expand to 8 channels using the RE-156 card).

### Digital Input Card — IN-141: $59

The eight inputs are optically isolated, so it's safe and easy to connect any "on/off" devices, such as switches, thermostats, alarm loops, etc. to your computer. To read the eight inputs, simply use BASIC INP (or PEEK).

### 24 Line TTL I/O — DG-148: $65

Connect 24 input or output signals (switches or any TTL device) to your computer. The card can be set for: input, latched output, strobed output, strobed input, and/or bidirectional strobed I/O. Uses the 8255A chip.

### Clock with Alarm — CL-144: $89

Powerful clock/calendar with: battery backup for Time, Date and Alarm setting (time and date); built in alarm relay, led and buzzer; timing to 1/100 second. Easy to use decimal format. Lithium battery included.

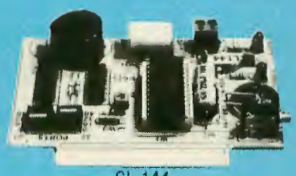
### Touch Tone® Decoder — PH-145: $79

Each tone is converted into a number which is stored on the board. Simply read the number with INP or POKE. Use for remote control projects, etc.

### A-BUS Prototyping Card — PR-152: $15

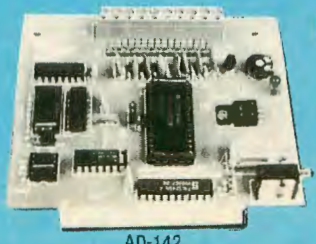
3½ by 4½ in. with power and ground bus. Fits up to 10 I.C.s

ST-143


CL-144

RE-140

IN-141


AD-142

### Smart Stepper Controller — SC-149: $299

World's finest stepper controller. On board microprocessor controls 4 motors simultaneously. Incredibly, it accepts plain English commands like "Move arm 10.2 inches left". Many complex sequences can be defined as "macros" and stored in the on board memory. For each axis, you can control: coordinate (relative or absolute), ramping, speed, step type (half, full, wave), scale factor, units, holding power, etc. Many inputs: 8 limit & "wait until" switches, panic button, etc. On the fly reporting of position, speed, etc. On board drivers (350mA) for small steppers (MO-103). Send for SC-149 flyer.

**Remote Control Keypad Option — RC-121: $49**
To control the 4 motors directly, and "teach" sequences of motions.

**Power Driver Board Option — PD-123: $89**
Boost controller drive to 5 amps per phase. For two motors (eight drivers).

**Breakout Board Option — BB-122: $19**
For easy connection of 2 motors. 3 ft. cable ends with screw terminal board.

### Stepper Motor Driver — ST-143: $79

Stepper motors are the ultimate in motion control. The special package (below) includes everything you need to get familiar with them. Each card drives two stepper motors (12V, bidirectional, 4 phase, 350mA per phase).

**Special Package:** 2 motors (MO-103) + ST-143: **PA-181: $99**

### Stepper Motors — MO-103: $15 or 4 for $39

Pancake type, 2¼" dia, ¼" shaft, 7.5°/step, 4 phase bidirectional, 300 step/sec, 12V, 36 ohm, bipolar, 5 oz-in torque, same as Airpax K82701-P2.

### Current Developments

Intelligent Voice Synthesizer, 14 Bit Analog to Digital converter, 4 Channel Digital to Analog converter, Counter Timer, Voice Recognition.

### A-BUS Adapters for:

| | |
|---|---|
| IBM PC, XT, AT and compatibles. Uses one short slot. | AR-133...$69 |
| Tandy 1000, 1000 EX & SX, 1200, 3000. Uses one short slot. | AR-133...$69 |
| Apple II, II+, IIe. Uses any slot. | AR-134...$49 |
| TRS-80 Model 102, 200. Plugs into 40 pin "system bus". | AR-136...$69 |
| Model 100. Uses 40 pin socket. (Socket is duplicated on adapter). | AR-135...$69 |
| TRS-80 Mod 3,4,4 D. Fits 50 pin bus. (With hard disk, use Y-cable). | AR-132...$49 |
| TRS-80 Model 4P. Includes extra cable. (50 pin bus is recessed). | AR-137...$62 |
| TRS-80 Model I. Plugs into 40 pin I/O bus on KB or E/I. | AR-131...$39 |
| Color Computers (Tandy). Fits ROM slot. Multipak, or Y-cable. | AR-138...$49 |

### A-BUS Cable (3 ft, 50 cond.) — CA-163: $24

Connects the A-BUS adapter to one A-BUS card or to first Motherboard.

**Special cable for two A-BUS cards: CA-162: $34**

### A-BUS Motherboard — MB-120: $99

Each Motherboard holds five A-BUS cards. A sixth connector allows a second Motherboard to be added to the first (with connecting cable CA-161: $12). Up to five Motherboards can be joined this way to a single A-BUS adapter. Sturdy aluminum frame and card guides included.

- The A-BUS is not a replacement for the Multi-pak

**Add $3.00 per order for shipping.**
**Visa, MC, checks, M.O. welcome.**
**CT & NY residents add sales tax.**
**C.O.D. add $3.00 extra.**
**Canada: shipping is $5**
**Overseas add 10%**

a Sigma Industries Company

**ALPHA Products**

242-W West Avenue, Darien, CT 06820

Technical info: **(203) 656-1806**
Orders only Except in CT **800 221-0916**
Connecticut orders: **(203) 348-9436**
All lines open weekdays 9 to 5 Eastern time

# T & D SUBSCRIPTION SOFTWARE CELEBRATES 6 YEARS

**ISSUE #1, JULY 1982**
COVER 1
RACE TRACK
HANGMAN
MUSIC ALBUM
LIFE EXPECTANCY
WORD TESTS
KILLER MANSION
BARTENDER
CALENDAR
ROBOT WAR

**ISSUE #2, AUG. 1982**
UFO COVER PT. 1
BIORYTHM
BOMBARDMENT
BLACK JACK
COST OF LIVING
FRENZY
BUSINESS LETTER
QUICK THINK
QUEST INSTRUCTIONS
QUEST FOR LENORE

**ISSUE #3, SEPT. 1982**
UFO COVER PT.2
BASKETBALL
CHUCKLUCK
SLOT MACHINE
ALPHABETIZER
NFL PREDICTIONS
FLAG CAPTURE
ROBOT BOMBER

**ISSUE #4, OCT. 1982**
UFO RESCUE
TANK BATTLE
DRIVEWAY
SOUNDS
BALLOON DROP
MIND BOGGLE
COCO-TERRESTRIAL ADV.
CALORIE COUNTER
JACK-O-LANTERN

**ISSUE #5, NOV. 1982**
CATALOG COVER
BOWLING
PROGRAM INVENTORY
PROMISSORY-LOANS
CHECKBOOK BALANCER
TRIGONOMETRY TUTOR
CONVOY
BAG-IT
SPECTRA SOUND
CONVEYOR BELT

**ISSUE #6, DEC. 1982**
CHRISTMAS COVER
RAINDROPS
STOCK MARKET
ADVANCE PONG
DESTROY
SOUND ANALYZER
CREATIVITY TEST
VOICE DATA
ML TUTORIAL PT.1
LOONY LANDER

**ISSUE #7, JAN. 1983**
NEW YEARS COVER
LIST ENHANCER
SUPER PRECISION DIV.
BOMB DIFFUSE
SPACE STATION
ML TUTORIAL PT. 2
SHOOT OUT
FIND UTILITY
CYBORG INS.
CYBORG FACES

**ISSUE #8, FEB., 1983**
COVER 8
DEFEND
3 DIMENSIONAL MAZE
COCO CONCENTRATION
AUTO LINE NUMBERING
ML TUTORIAL PT.3A
ML TUTORIAL PT.3B
NUCLEAR POWER PLANT
DUAL BARRIER
BRICKS

**ISSUE #9, MARCH 1983**
TIME MACHINE COVER
TRIG DEMO
PYRAMID OF CHEOPS
PROGRAM PACKER
BUDGET
ELECTRONIC DATE BOOK
ML TUTORIAL PT.4
TAPE DIRECTORY
BLOCK-STIR
COCO ADDING MACHINE

**ISSUE #10, APRIL 1983**
TENTH COVER
PYRAMID OF DANGER
TYPING TUTOR
ML TUTORIAL PT.5
TINYCALC
STOCK MARKET COMP
YAH-HOO
MISSILE ATTACK
SCREEN PRINT
BRIKPONG

**ISSUE #11, MAY 1983**
ELEVENTH COVER
ARCHERY
FROG JUMP
ML TUTORIAL PT.6
MLT DICTIONARY
BASIC SPEED UP TOT.
METRIC CONVERTOR
GRAPHIC QUAD ANTENNA
GRAPHICS PROGRAM
CATERPILLAR CAVE

**ISSUE #12, JUNE 1983**
TWELFTH COVER
SHOOTING GALLERY
BOMB STOPPER
VALLEY BOMBER
STAR FIGHTER
WHEEL OF FORTUNE
ML TUTORIAL PT.7
MERGE UTILITY
RAM TEST
LANDER

**ISSUE #13, JULY 1983**
THIRTEENTH COVER
FLASH CARD
ICE BLOCK
COSMIC FORTRESS
MAIL LIST
DOLLARS & CENTS
ML TUTORIAL PT.8
SDSK COPY
MUSIC SYNTHESIZER
CRAWLER

**ISSUE #14, AUG. 1983**
MYSTERY COVER
ROW BOAT
COMPUTER TUTL PT 1
INDEX DATA BASE
DISK ZAPPER
COCO-MONITOR
COCO-ARTIST
ROBOT COMMAND
TEST SCREEN PRINT
HIGH RESOLUTION TEXT

**ISSUE #15, SEPT. 1983**
MYSTERY COVER PT.2
GOLD VALUES
TREK INSTRUCTIONS
TREK
HIGH TEXT MODIFICATION
ASTRO DODGE
DR. COCO
PEG JUMP
MORSE CODE
PURGE UTILITY

**ISSUE #16, OCT. 1983**
MYSTERY COVER
BOPOTRON
DIRECTORY RECALL
VECTOR GRAPHICS INST.
VECTOR GRAPHICS
SKYDIVER
SWERVE AND DODGE
NIMBO BATTLE
TAPE ANALYSIS UTILITY
LIFE GENERATIONS

**ISSUE #17, NOV. 1983**
THANKSGIVING COVER
3-D TIC-TAC-TOE
INDY 500
COLLEGE ADVENTURE
MEMORY GAME
DUNGEON MASTER
WEATHER FORECASTER
GRID FACTOR INST.
GRID FACTOR
DRAW

**ISSUE #18, DEC. 1983**
CHRISTMAS COVER
CLIMBER
GALACTIC CONQUEST
WARLORDS
STATES REVIEW
MATH TUTOR
MACHINE LANGUAGE DATA
PRINTER UTILITY INST.
PRINTER UTILITY
MUTANT WAFFLES

**ISSUE #19, JAN. 1984**
BANNER
PROBE
DISK DIR. PROTECTOR
OPTICAL CONFUSION
WORD PROCESSOR
WORD SEARCH
ASTRONAUT RESCUE
STAR TRAP
PIE CHART
FORCE FIELD

**ISSUE #20, FEB. 1984**
INTRODUCTION
HINTS FOR YOUR COCO
ESCAPE ADVENTURE
SEEKERS
MASTER BRAIN
LIST CONTROLLER
DISKETTE CERTIFIER
ROM COPY
BASIC RAM
SNAFUS

**ISSUE #21, MAR. 1984**
BASIC CONVERSIONS
FINANCIAL ADVISE
CASTLE STORM
DOS HEAD CLEANE'
COCO TERMINAL
SNAKE CRAWLER
WAR CASTLE
SKY FIRE
EASY BASIC
DOTS 3-D

**ISSUE #22, APRIL 1984**
HEALTH HINTS
GLIBLIBS
CLOTHER SLITHER
BIBLE 1 & 2
BIBLE 3 & 4
CATCH ALL
INVADER
ALIEN RAID
MOON ROVER
IO ERROR IGNORER

**ISSUE #23, MAY 1984**
MONEY SAVERS 1 & 2
STOCKS OR BOMBS
WALL AROUND
COCO TECHNICAL LOOK PT.1
NUCLEAR WAR INST.
THERMONUCLEAR WAR
CIRCUIT BREAKER
MOUSE RACES
SUPER SQUEEZE
DATA FALL

**ISSUE #24, JUNE 1984**
DIR PACK & SORT
BRICK OUT
COCO TECHNICAL LOOK PT. 2
USA SLIDE PUZZLE
51 *24 SCREEN EDITOR
51 *24 SCREEN EDITOR
CITY INVADERS
PRINTER SPOOLER
STEPS
SNAKE

**ISSUE #25, JULY 1984**
CLOCK
COCO TECHNICAL LOOK PT.3
SKID ROW ADVENTURE
MONEY MAKER
PIN-HEAD CLEANING
LINE EDITOR INST.
LINE EDITOR
BOOMERANG
BUBBLE BUSTER
ROCOCHET

**ISSUE #26, AUG. 1984**
PEEK POKE & EXECUTE
SAUCER RESCUE
YOUNG TYPER TUTOR
O-TEL-O
OLYMPIC EVENTS
DOUBLE DICE
COCO DATABASE
BATTLE STAR
COCO-PIN BALL
MONTEZUMAS DUNGEONS

**ISSUE #27, SEPT. 1984**
COCO TO COM 64
GALACTIC SMUGGLER
INDY RACE
ACCOUNT MANAGER
CASSETTE MERGE UTILITY
STRING PACKING TUTORIAL
SPACE DUEL
BUGS
TRAP-BALL
BALLOON FIRE

**ISSUE #28, OCT. 1984**
HANGING TREE
CHECKERS
FOOTBALL
MORE PEEKS & POKES
SPELLING CHECKER
SOUND DEVELOPMENT
WORD GAME
SCREEN REVERSE
AUTO COPY
RAT ATTACK

**ISSUE #29, NOV. 1984**
DISK ROLL OUT
ROBOT ON
MULTIPONG
ADVENTURE GENERATOR
QUEST ADVENTURE
QUARTER BOUNCE
DUAL OUTPUT
KEY REPEAT
FULL EDITOR
METEOR

**ISSUE #30, DEC. 1984**
MATH HELP
ZECTOR ADVENTURE
WORLD CONQUEST
DRAG RACE
MINE FIELD
T-NOTES TUTORIAL
T & D PROGRAM INDEXER
SYSTEM STATUS
ERROR TRAP
DROLL ATTACK

**ISSUE #31, JAN. 1985**
TREASURES OF BARSOOM
BATTLEGROUND
STRUCT. COMPILED LANG.
MINIATURE GOLF
STAR DUEL
ARITHMETIC FOOTBALL
GRID RUN
SPIRAL ATTACK
FAST SORT
MUNCHMAN

**ISSUE #32, FEB. 1985**
DR. SIGMUND
ICE WORLD ADVENTURE
LOTTERY ANALYST
BASIC COMPILER
MUSIC CREATOR
MEANIE PATROL
TRI-COLOR CARDS
SHAPE RECOGNITION
DISK BACKUP
SPACE PROTECTOR

**ISSUE #33, MAR. 1985**
LIGHT CYCLE
PAINT
SKEET SHOOTING
GUITAR NOTES
MI DISK ANALYZER
PERSONAL DIRECTORY
NAUGHA ADVENTURE
EGGS GAME
DISK DIRECTORY PRINT
SPEED KEy

**ISSUE #34, APRIL 1985**
HOVER TANK
POWER SWORD
TERMITE INVASION
SPELLING CHECKER
DOS BOSS
NINE CARD CHOICE
MUSIC GENERATOR
FYR-DRACA
ORIVE TEST
GRAPHIC TOUR

**ISSUE #35, MAY 1985**
SELECT A GAME 1
TAPE PROBLEMS
STROLL TRIVIA
SOFTBALL MANAGER
FONTS DEMO
CLOWN DUNK MATH
ALPHA MISSION
DOS ENHANCER
KNOCK OUT
HAUNTED HOUSE

**ISSUE #36, JUNE 1985**
SELECT A GAME 2
VIDEO COMPUTER
SPEECH SYNTHESIS
SPEECH RECOGNITION
SPACE LAB
AUTO COMMAND
COMPUTER MATCHMAKER
KNIGHT & THE LABYRINTH
STAR SIEGE
TALKING SPELLING QUIZ

VISA

MasterCard

**SUPER SAVINGS**

**Single Issue ..... $8.00**
**2-5 Issues ..... $6.00 ea.**
**6-10 ISSUES ..... $5.00 ea.**
**11 or more Issues . $4.50 ea.**
**All 72 Issues ..... $199.00**

**Purchase 20 or more issues and receive a free 6 month subscription.**

- Every Issue Contains 10 or More Programs
- Many Machine Language Programs
- Available for COCO I, II and III
- All Programs Include Documentation

- We send 1st Class No Charge
- Personal Checks Welcome!

RAINBOW
CERTIFICATION SEAL

# AND OVER 720 PROGRAMS WITH A BACK ISSUE SALE!

**ISSUE #37, JULY 1985**
CHESS MASTER
BIBLE 5-7
SHIP WREK ADVENTURE
FILE TRANSFER
FOUR IN A ROW
MARSHY
TAPE CONTROLLER
CATACOMB
AUTO TALK
SGR8PAK

**ISSUE #38, AUG. 1985**
GOLF PAR3
WIZARD ADVENTURE
KITE DESIGN
ROBOTS
GOMOKU
AMULET OF POWER
LINE COPY UTILITY
DISK PLUMBER
SUPER RAM CHECKER
GRAPHIC HORSE RACE

**ISSUE #39, SEPT. 1985**
DRUNK DRIVING
CAR MANAGER
SQUEEZE PLAY
SUPER BACKUP
RECIPE MACHINE
ANTI-AIRCRAFT
UNREASON ADVENTURE
TALKING ALPHABET
SUPER VADERS
AUTOMATIC EDITOR

**ISSUE #40, OCT. 1985**
STAR TREK
HAM RADIO LOG
COCO WAR
DISK LABELER
SHIP WAR
ELECTRIC COST
MULTIKEY BUFFER
NUKE AVENGER
CURSOR KING
SAND ROVER

**ISSUE #41, NOV. 1985**
GRUMPS
DISK DRIVE SPEED TEST
SOLAR CONQUEST
GAS COST
RIME WORLD MISSION
WUMPUS
CHARACTER EDITOR
GRAPHIC TEST
GRAPHIC LOOPY
BOLD PRINT

**ISSUE #42, DEC. 1985**
HOME PRODUCT EVALUATION
YAHTZEE
DISK UTILITY
MACH II
ELECTRONIC BILLBOARD
CAR CHASE
SUPER MANSION ADVENTURE
SLOT MACHINE GIVE AWAY
TEXT BUFFER
TUNNEL RUN

**ISSUE #43, JAN. 1986**
DUELING CANNONS
WATER COST
ZIGMA EXPERIMENT
MUSICAL CHORDS
SAFE PASSAGE
PASSWORD SCRAMBLER
GUNFIGHT
KEYPAD ENTRY
STYX GAME
PRINTER DIVERT

**ISSUE #44, FEB. 1986**
HOME INVENTORY
NINE BALL
PRINTER REVIEW
EXPLORER ADVENTURE
SPANISH LESSONS
CROSS FIRE
RAM SAVER
GRAY LADY
JOYSTICK INPUT
COSMIC SWEEPER

**ISSUE #45, MAR. 1986**
INCOME PROPERTY MGMT.
ELECTRONIC BILLBOARD 2
MOUNTAIN BATTLE
THE FIGHT
COCO KEENO
HOCKEY
LOGICAL PATTERNS
ON SCALE SCREEN
LIBERTY SHIP
SINGLE STEP RUN

**ISSUE #46, APRIL 1986**
SPECIAL EVENTS REMINDER
DISK LOCK
SMALL BUSINESS MANAGER
BOMB RUN
TANKS
TAR PITS
BASEBALL
NUMBER RELATIONSHIPS
ROULETTE
GLOBAL EDITOR

**ISSUE #47, MAY 1986**
CHRISTMAS LIST
BLACK HOLE
PITCHING MANAGER
SYMBOLIC DIFF.
BUG SPRAY
OWARE CAPTURE
EASY GRAPHICS
DESERT JOURNEY
SCREEN CONTROL
FULL ERROR MESSAGE

**ISSUE #48, JUNE 1986**
CHESTER
TV SCHEDULE
BASE RACE
ROMAN NUMERALS
ASTRO DODGE
HIRED AND FIRED
MULTI COPY
AUTO MATE
SCROLL PROJECT
NOISE GENERATOR

**ISSUE #49, JULY 1986**
COMPUTER I.O.U.
DISK DISASSEMBLER
BAKCHEK
PACHINKO
STOCK CHARTING
HAUNTED STAIRCASE
CANYON BOMBERS
DRAGONS 1 & 2
GRAPHIC SCROLL ROUTINE
AUTO BORDER

**ISSUE #50, AUG. 1986**
BUSINESS INVENTORY
D & D ARENA
DISK CLERK
PC SURVEY
TREASURE HUNT
SCREEN GENERATOR
ASTRO SMASH
NFL SCORES
BARN STORMING
SMASH GAME

**ISSUE #51, SEPT. 1986**
ASSET MANAGER
MONEY CHASE
FISHING CONTEST
RIP OFF
HAND OFF
BUDGET 51
VAN GAR
DOS EMULATOR
MEM DISK
VARIABLE REFERENCE

**ISSUE #52, OCT. 1986**
ACCOUNTS RECEIVABLE
WORKMATE SERIES
CALENDAR
INVASION
THE TRIP ADVENTURE
FOOT RACE
FLIPPY THE SEAL
SCREEN CALCULATOR
ABLE BUILDERS
SUPER ERROR2

**ISSUE #53, NOV. 1986**
CORE KILL
LUCKY MONEY
COOKIES ADVENTURE
NICE LIST
SPANISH QUIZZES
PAINT EDITOR
CARVERN CRUISER
SNAP SHOT
MEGA RACE
KICK GUY

**ISSUE #54, DEC. 1986**
JOB LOG
PEGS
DIGITAL SAMPLING
JUNGLE ADVENTURE
PAINT COCO 3
CONVERT 3
COMPUTER TYPE
PANZER TANKS
MRS PAC
BIG NUM

**ISSUE #55, JAN. 1987**
GRADE BOOK
MAIL LIST
DOWN HILL
FIRE FOX
JETS CONTROL
GALLOWS
DIR MANAGER
FIRE RUNNER
GRAPHICS BORDER
COSMIC RAYS

**ISSUE #56, FEB. 1987**
CALENDAR PRINT
CRUSH
GALACTA
OCEAN DIVER
CLUE SUSPECT
WORD EDITOR
ALIEN HUNT
DEMON'S CASTLE
PICTURE DRAW
DIG

**ISSUE #57, MAR. 1987**
THE BAKERY
ENCHANGED VALLEY ADV.
SAFE KEEPER
WAR 1
BOMB DISABLE
PIANO PLAYER
SPREAD SHEET
SLOT MANEUVER
LIVING MAZE
GEM SEARCH

**ISSUE #58, APRIL 1987**
ACCOUNTS PAYABLE
PRINTER GRAPHICS
SIMON
PANELING HELPER
MULTI CAKES
CAR RACE
ELECTRONICS I
BATTLE TANK
DISKETTE VERIFY
WEIRDO

**ISSUE #59, MAY 1987**
GENEOLOGY
HOME PLANT SELECTION
CHECK WRITER
HELIRESCUE
KABOOM
NEW PONG
CROQUET
FUNCTION KEYS
ZOOM
ELECTRONICS 2

**ISSUE #60, JUNE 1987**
JOB COSTING
LABELS
CATCH A CAKE
COCO MATCH
ROBOTS
STREET RACERS
BOWLING 3
ELECTRONICS 3
GRAFIX
KRON

**ISSUE #61, JULY 1987**
EZ ORDER
SUBMISSION WRITER
KEYS ADVENTURE
WALLPAPER
CHOPPER COMMAND
UNDERSTANDING OPPOSITES
BIT CODE PLOTTING
ELECTRONICS 4
KING PEDE
RAIDER

**ISSUE #62, AUG. 1987**
PENSION MANAGEMENT
HERB GROWING
CATOLOGER UTILITY
RAIDERS
ALPHABETIZING
U.F.O.
ELECTRONICS 5
RAMBO ADVENTURE
BLOCKS
MULTI SCREEN CAVES

**ISSUE #63, SEPT. 1987**
GENEOLOGIST HELPER
SMART COPY
MAINTENANCE REPORTING
COCO3-COCO 2 HELPER
DIRECTORY PICTURE
SUB ATTACK
SAVE THE MAIDEN
CAVIATOR
ELECTRONICS 6
MONKEY SHINE

**ISSUE #64, OCT. 1987**
GARDEN PLANTS
FORT KNOX
ELECTRONICS FORMULAS
SNAKE IN THE GRASS
CYCLE JUMP
GEOMETRY TUTOR
WIZARD
GAME OF LIFE
ELECTRONICS 7
FLIGHT SIMULATOR

**ISSUE #65, NOV. 1987**
TAXMAN
DAISY WHEEL PICTURES
CHILDSTONE ADVENTURE
SIR EGGBERT
CROWN QUEST
GYM KHANA
COCO 3 DRAWER
FOOTBALL
ELECTRONICS 8
CHOP

**ISSUE #66, DEC. 1987**
ONE ROOM ADVENTURE
OS9 TUTORIAL
RIVER CAPTAIN
SOUND EFFECTS
BETTING POOL
ADVANCE
MATH TABLES
ELECTRONICS 9
LOWER TO UPPER
NOIDS

**ISSUE #67, JAN. 1988**
AUDIO LIBRARY
SAVE THE EARTH
WEIGHTS AND MEASURES
LOW RES PICTURES
WORD COUNTER
BACARAT
BATTLE SHIP
ELECTRONICS 10
TAPE CONVENIENCE
PENQUIN

**ISSUE #68, FEB. 1988**
COINFILE
WORD COUNTER
SQUIRREL ADVENTURE
AREA CODES
DRAW POKER
TURTLE RACES
ELECTRONICS 11
MULTI SCREEN
CANON PRINT
COCO TENNIS

**ISSUE #69, MAR. 1988**
POLICE CADET
STAMP COLLECTION
BARRACKS ADVENTURE
CITY/TIME
HI-LO/CRAPS
OLYMPICS
HI-RES CHESS
ELECTRONICS 12
DOUBLE EDITOR
DOUBLE BREAKOUT

**ISSUE #70, APRIL 1988**
BLOTTO DICE
SUPER COM
GENESIS ADVENTURE
PLANETS
PHK/WAR
SIGN LANGUAGE
ARX SHOOTOUT
ELECTRONICS 13
MAGIC KEY
SNAP PRINT

**ISSUE #71, MAY 1988**
SUPER LOTTO
ROBOT ADVENTURE
MAZE
YAHTZEE 3
PHASER
SHAPES & PLATES
STAR WARS
ELECTRONICS 14
PRINTER CONTROL
MAZE 2

**ISSUE #72, JUNE 1988**
FLYING OBJECTS
THREE STODGES
HOSTAGE
PROGRAM TRIO
GLADIATOR
US & CAN QUIZ
JEOPARDY
ELECTRONICS 15
COCO 3 PRINT
CTTY COMMUNICATOR

MAIL TO:

**T & D Subscription Software**
**2490 Miles Standish Drive**
**Holland, Michigan 49424**
**(616) 399-9648**

Name _____

Address _____

City _____ State _____ ZIP _____

Credit Card # _____

Expires _____

TOTAL AMOUNT $ _____

**CIRCLE ISSUES DESIRED**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 9 | 17 | 25 | 33 | 41 | 49 | 57 | 65 |
| 2 | 10 | 18 | 26 | 34 | 42 | 50 | 58 | 66 |
| 3 | 11 | 19 | 27 | 35 | 43 | 51 | 59 | 67 |
| 4 | 12 | 20 | 28 | 36 | 44 | 52 | 60 | 68 |
| 5 | 13 | 21 | 29 | 37 | 45 | 53 | 61 | 69 |
| 6 | 14 | 22 | 30 | 38 | 46 | 54 | 62 | 70 |
| 7 | 15 | 23 | 31 | 39 | 47 | 55 | 63 | 71 |
| 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 |

**PLEASE CIRCLE**
**TAPE or DISK**

*The excitement continues!*

# The Fourth Rainbow Book of Adventures

Fourteen fascinating new Adventures from the winners of our fourth Adventure competition. Rely on your wits to escape a hostile military installation, try to stop the Nazi plan to invade Great Britain, or manage to reinstate our defense system before the enemy launches a massive missile attack — and that's only the beginning!

**The Park of Mystery** — You overhear a gang of robbers discussing where they've hidden their loot. Can you find it — and battle greed and confusion at the same time?

**Superspy** — You awaken from a horrifying nightmare of chases, inexplicable scenery changes and sickening freefalls into space. Or was it a dream? You be the judge — and determine your own fate!

**Term Paper** — A *real* nightmare: Someone's stolen your freshman midterm paper and hidden its pages all over CoCo State's campus. Are you smart enough to find them before you miss the due date and flunk the course?

**House Adventure** — Try to find your way out of a mysterious abandoned house that keeps sprouting new rooms just as you think you've found an exit.

**Life: An Everyday Adventure** — Just getting up in the morning in time to do last-minute chores before catching a plane to a family reunion proves you don't have to leave home to find adventure.

**The Earth's Foundations** — A mysterious maze inside a deep crevice near your village is having a devastating effect on the entire area. You've been chosen to investigate, and promised great riches — *if* you survive!

Experience other traditional and contemporary challenges from these winning authors: Mike Anderson, Tio Babich, David Bartmess, Stephen Berry, Eugene Carver, Charles Farris, Jeff Hillison, Jeff Johnson, Richard Kottke, Ken Lie, Andre Needham, Fred Provoncha, Paul Ruby Jr. and Eric Santanen.

## The Fourth Rainbow Book of Adventures is only $10.95!

## Tape $9.95, Two-Disk Set $14.95

The tape and disks are adjuncts and complements to the book; the book is necessary for introductory material and loading instructions.

Please send me:

The Fourth Rainbow Book of Adventures $10.95* _____

The Fourth Rainbow Adventures Tape $9.95 _____

The Fourth Rainbow Adventures Disk Set $14.95 _____

Name _____

Address _____

City _____ State _____ ZIP _____

☐ My check in the amount of _____ is enclosed*

Please charge to my: ☐ VISA ☐ MasterCard ☐ American Express

Acct. No. _____

Exp. Date _____

Signature _____

**Mail to: The Fourth Rainbow Book of Adventures, The Falsoft Building, P.O. Box 385, Prospect, KY 40059**

*Add $2.00 per book for shipping and handling in the U.S. Outside the U.S. add $4 per book *(U.S. currency only)*. Kentucky residents add 5% sales tax. In order to hold down costs, we do not bill. Please allow 6-8 weeks for delivery.

To order by phone (credit card orders only), call (800) 847-0309, 8 a.m. to 5 p.m. EST. For other inquiries, call (502) 228-4492.

# VIP Writer III 2.0

## 495K Total Text Space • EASY 4 Color MENUS

*"In the beginning there was **VIP Writer** and users saw that it was good, But it's not the best anymore. There's a new word processor to claim the crown...**VIP Writer III** –Setting the Standard"* **–RAINBOW Sept. 1988**

### COMPARISON CHART

| | VIP Writer III | Telewriter 128 | Word Power 3 |
|---|---|---|---|
| Screen Display | 32/40/64/80 | 40/80 | 80 |
| Spelling Checker | **VIP Speller** | NONE | FREE WARE |
| Dictionary Size | 50,000 Words | NONE | 20,000 Words |
| Print Spooler | YES | NONE | YES |
| Total Space 128K | **106,000** | 48,000 | 72,000 |
| Total Space 512K | **495,104** | 48,000 | 450,000 |

### SCREEN DISPLAY OPTIONS

VIP Writer III offers more screen width options -all with 24 lines and actual lower case letters using the CoCo 3's hardware display. It runs at double clock speed and has 4-color menus making VIP Writer III FAST and EASY to use! You can choose foreground, background, hilite and cursor colors from up to 64 hues. Color can be turned ON or OFF for the best possible display using a monochrome monitor or TV set. VIP Writer III has a context sensitive help facility to display command usage in easy to read colored windows.

### CUSTOMIZER & PRINTER INSTALLER

VIP Writer III comes with a configuration / printer installation program which lets you customize VIP Writer III to suit your own liking. You can set screen width and colors as well as margins and more. You can also install your own printer and set interface type (serial, parallel or J&M), baud rate, line feeds, etc. Once done, you never have to enter these parameters again! VIP Writer III will load n' go with your custom configuration every time!

### TEXT FILE STORAGE

VIP Writer III creates ASCII text files which are compatible with all other VIP Programs as well as other programs which use ASCII files. You can use VIP Writer III to even type BASIC programs! There is a 48K text buffer (438K in a 512K CoCo 3) and disk file linking allowing virtually unlimited text space. VIP Writer III works with up to four disk drives and lets you display directories and free space as well as rename or kill disk files. In addition VIP Writer III is 100% compatible with the RGB Computer Systems Hard Disk.

### EDITING FEATURES

VIP Writer III has a full featured screen editor which can be used to edit text with lines up to 240 characters long with or without automatic word wrap around. You can select type-over mode or insert mode. There is even an OOPS command to recall a cleared text buffer. Other editing features include: Type-ahead • typamatic key repeat and key beep for flawless text entry • end of line bell • full four way cursor control with scrolling • top of textfile • bottom of textfile • page up • page down • top of screen • bottom of screen • beginning of line • end of line • left one word • right one word • DELETE character, to beginning or end of line, word to the left or right, or entire line • INSERT character or line • LOCATE and/or CHANGE or DELETE single or multiple occurrence using wildcards • BLOCK copy, move or delete with up to TEN simultaneous block manipulations • TAB key and programmable tab stops • word count • line restore • three PROGRAMMABLE FUNCTIONS to perform tasks such as auto column creation and multiple copy printing.

### TEXT FORMATTING

VIP Writer III automatically formats your text for you or allows you to format your text in any way you wish. You can change the top, bottom, left or right margin and page length. You can set your text flush left, center or flush right. You can turn right hand justification on or off. You can have headers, footers, page numbers and TWO auxiliary lines which can appear on odd, even or all pages. You can also select the line on which they appear! You can even change the line spacing! Parameters can be altered ANYWHERE !

### PREVIEW PRINT WINDOW

VIP Writer III features an exclusive format window which allows you to preview your document BEFORE PRINTING IT! You are able to move up, down, left and right to see centered and justified text, margins, page breaks, broken paragraphs, orphan lines etc.

### PRINTING

VIP Writer III prints TWICE as fast as any other CoCo word processor! It supports most serial or parallel printers using J&M JFD-CP or Rainbow interface and gives you the ability to select baud rates from 110 to 19,200. You can imbed printer control codes anywhere in your text file EVEN WITHIN JUSTIFIED TEXT! VIP Writer III also has TWENTY programmable printer macros which allow you to easily control all of your printers capabilities such as bold, underline, italics and superscript using simple key strokes. Other features include: multiple copy printing • single sheet pause • line feeds.

### PRINT SPOOLING

Save up to $150 on a print spooler because VIP Writer III has a built in print spooler with a 57,000 character buffer which allows you to print one document WHILE you are editing another. You don't have to wait until your printer is done before starting another job!

### SPELLING CHECKER

VIP Writer III includes VIP Speller AT NO ADDITIONAL COST! VIP Speller checks text for misspelled words and has a 50,000 word dictionary that can be added to or edited.

### DOCUMENTATION

VIP Writer III comes with a well written 125 page manual which is Laser printed, not dot-matrix like the competition. It includes a tutorial, glossary of terms and examples for the beginner as well as a complete index!

VIP Writer III includes VIP Speller. **DISK $79.95**

Writer III or Library /W owners: Upgrade to the VIP Writer III 2.0 for $10 + $3 S/H. Send ORIGINAL disk and $13 total.

VIP Writer owners: Upgrade to the VIP Writer III 2.0 for $49.95 + $3 S/H. Send ORIGINAL disk and $52.95 total.

# VIP Database III

VIP Database III features selectable screen displays of 40, 64 or 80 characters by 24 lines with choice of 64 foreground, background, hilite and cursor colors for EASY DATA ENTRY. It uses the CoCo 3's hardware screen and double clock speed to be the FASTEST database available! VIP Database III will handle as many records as will fit on your disks and is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. IN-MEMORY SORT of records is LIGHTNING FAST and provides for easy listing of names, figures, addresses, etc., in ascending or descending alphabetical or numeric order. Records can be searched for specific entries using multiple search criteria. The built-in mail-merge lets you sort and print mailing lists, print form letters, address envelopes - the list is endless. The built-in MATH PACKAGE even performs arithmetic operations and updates other fields. VIP Database III also has a print spooler and report generator with unlimited print format capabilities including embeddable control codes for use with ALL printers. **DISK $69.95**

VIP Database owners: Upgrade to the VIP Database III for $39.95 + $3 S/H. Send ORIGINAL disk and $42.95 total.

# VIP Library

## /Writer Database Enhanced

The VIP Library /WDE combines all six popular VIP application programs - VIP Database III, VIP Writer III, VIP Speller, VIP Calc, VIP Terminal and VIP Disk-ZAP - into one program on one disk! The program is called VIP Desktop. From the desktop you have instant access to word processing with a spelling checker always in attendance, data management with mail merge, spreadsheet financial analysis, telecommunications and disk maintenance. * **DISK $169.95**

For VIP Library shipping please add $4 USA. $5 Canada. $10 Foreign.

VIP Library owners: Upgrade to the VIP Library /WDE for $89.90* + $3 S/H. Send ORIGINAL disk and $92.90 total.

* Future VIP Library upgrades available at reduced cost.

*All products run under RSDOS and are not copy protected.*

## SD ENTERPRISES

(503) 663-2865 POB 1233 Gresham, OR 97030

Non VIP Library orders add $3 for shipping and handling in USA. Canada $4. Foreign $6. COD orders add an additional $2.25. Checks allow 3 weeks for delivery. All other orders are shipped the same day.

Telewriter 128 is a trademark of Cognitec. Word Power 3 is a trademark of Microcom Software.

# CoCo Gallery

## 1st Prize
## CoCo 3

**Richard Perreault**
**Tiger**

Richard, a student in Boucherville, Quebec, used *CoCo Max III* to develop this view of this fierce, flesh-eating native of Asia. Richard enjoys skiing, fishing and computing.

## 3rd Prize

**Robert Williams**
**C-O-ARMS**

CoCo 3 BASIC was used to create this scene. Robert has been using a CoCo for four years, enjoys role-playing games and lives in Lucasville, Ohio.

## 1st Prize
## CoCo 1 and 2

**Mark Winship**
**Spacecraft**

*Deskmate* and the CoCo 2 were used to illustrate Mark's idea of a traveling spacecraft. He lives in Houlton, Maine.

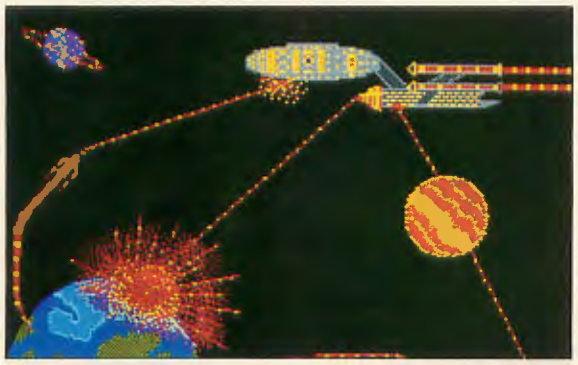
**SHOWCASE YOUR BEST!** You are invited to nominate original work for inclusion in upcoming showings of "CoCo Gallery." Share your creations with the CoCo Community! Be sure to send a cover letter with your name, address and phone number, detailing how you created your picture (what programs you used, etc.) and how to display it. Also, please include a few facts about yourself.

Don't send us anything owned by someone else; this means no game screens, digitized images from TV programs or material that's already been submitted elsewhere. A digitized copy of a picture that appears in a book or magazine is *not* an original work.

We will award two first prizes of $25, one for the CoCo 3 and one for the CoCo 1 and 2; one second prize of $15 and one third prize of $10. Honorable Mentions may also be given

Please send your entry on either tape or disk to the CoCo Gallery, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. Remember, this is a contest and your entry will not be returned.

**— Angela Kapfhammer, Curator**



## 2nd Prize

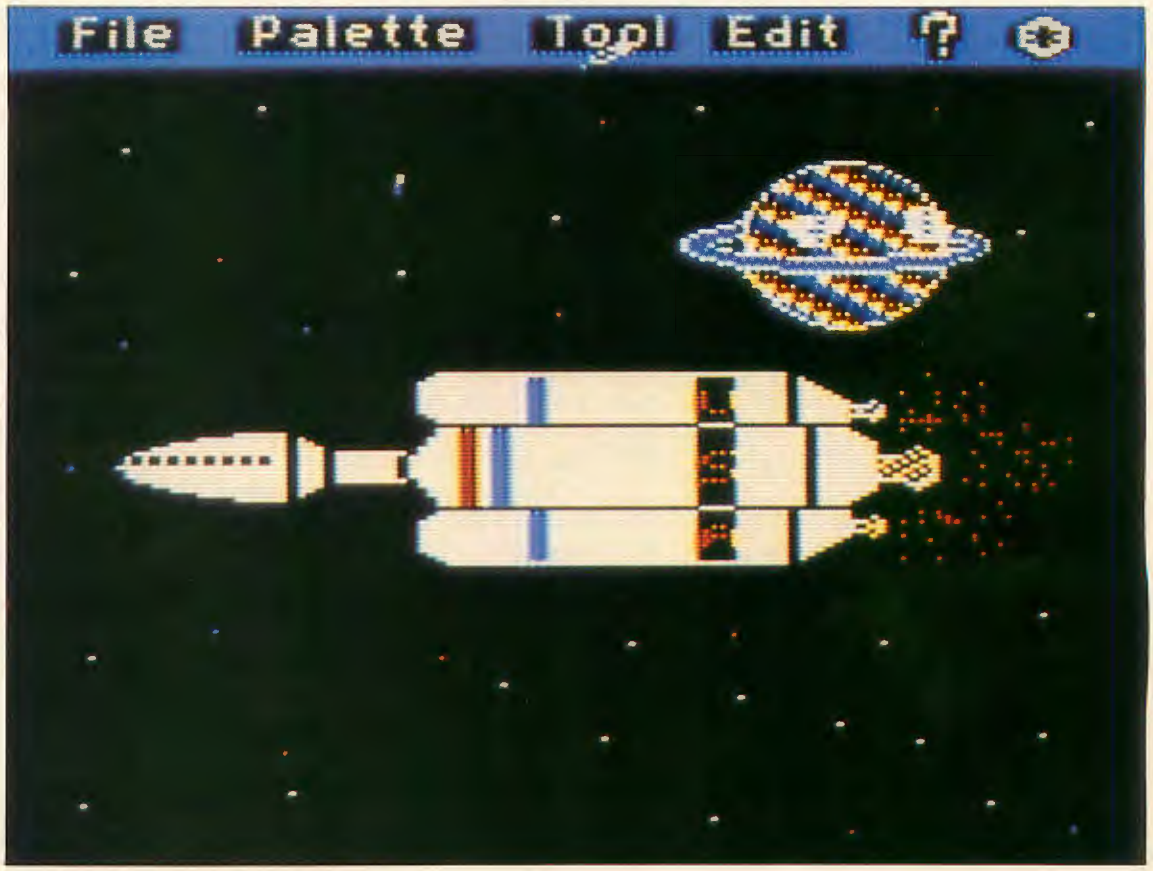
**James Farmer**
**Starship**

This animated scene was developed with *CoCo Max III*. James lives in North Charleston, South Carolina.

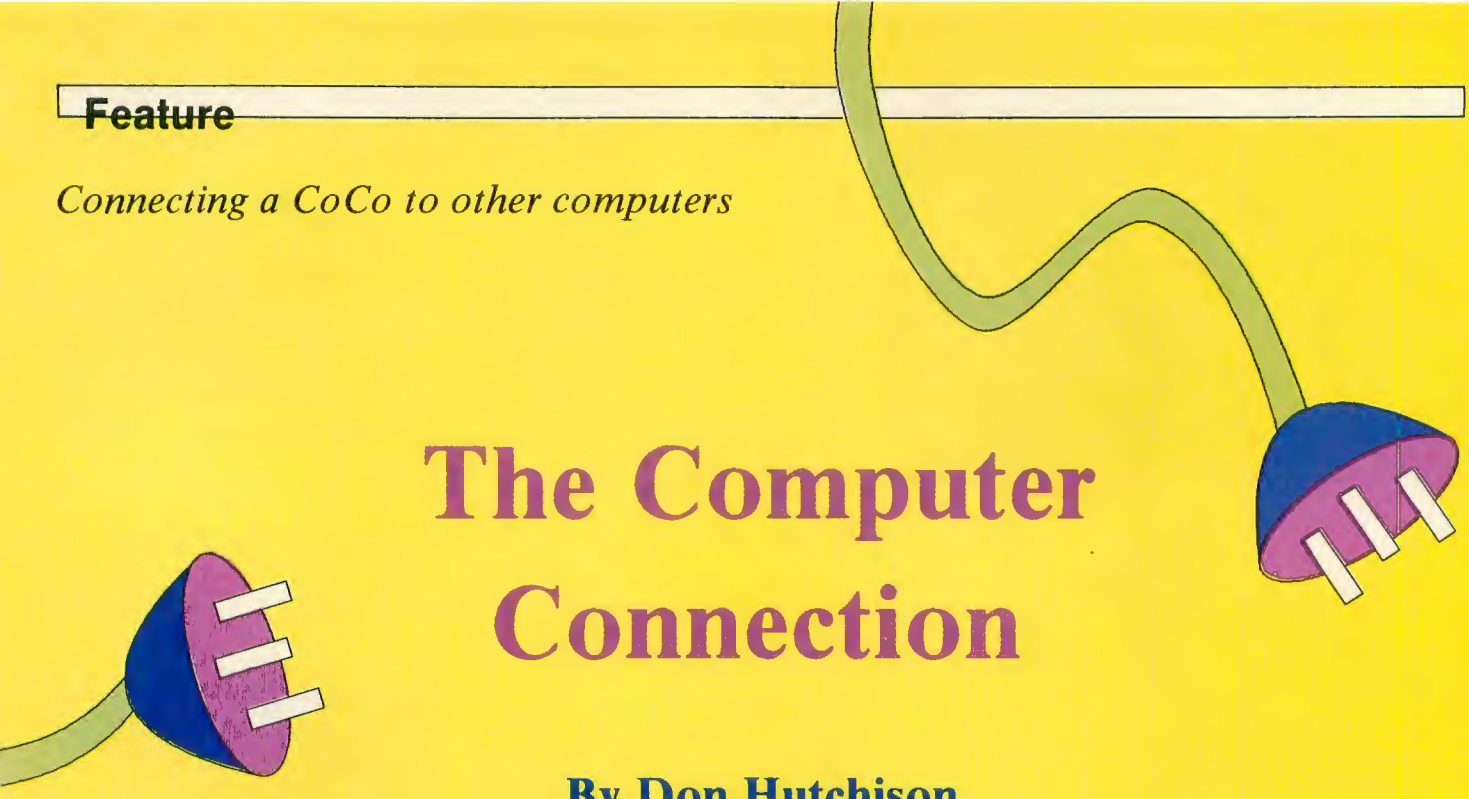
## Honorable Mention

**Wally Mayes**
**Eagle**

Wally, a machinist in Hamilton, Ohio, used *CoCo Max III* to develop this depiction of the national emblem.



*Connecting a CoCo to other computers*



# The Computer Connection

## By Don Hutchison

When I travel, I like to use my portable Tandy 102 both to stay in touch with Delphi, and to generate short messages and text files for articles, Delphi Mail, Help notes, etc. I enjoy the convenience of using the 102 almost anywhere. Sometimes, I sit on my sofa and use the 102 while watching TV or talking on the phone. I am sure that there are many others who like the 102 for the same reasons.

In the past, however, I felt restricted by my portable's inability to format. I wanted to transfer the text to my CoCo 3 to use its word processor for cleanup, formatting and final printing. I also wanted to transfer PCM ON DISK programs from my PC compatible to my Tandy 102. I began looking for a way to transfer programs from my PC compatible to my 102. Once I solved that problem, I began looking for ways to connect the PC compatible to my CoCo.

There are many reasons to use a second computer to download programs. You may choose to use your PC compatible because it has a hard drive or because your IBM terminal program provides support for *batched* uploads and downloads. (This option allows the transfer of multiple files with little or no operator intervention, and if you are paying for access to an information service, the time savings can be significant.) Programs that are downloaded onto your PC compatible can be transferred to your CoCo at your leisure by using the techniques described in this article.

Although you won't be able to transfer MS-DOS programs to your CoCo and expect them to operate correctly, the CoCo and the PC compatible are now connected in a manner that allows them to communicate. If you prefer to download programs from Delphi onto a hard drive, there is now a convenient way to transfer the files to your CoCo.

### Background

Generally, computers are not sociable things. Indeed, they prefer to be left alone. A computer chooses one owner and will do what that owner asks of it, but it usually prefers not to communicate with other computers. Fortunately, computers can be made to talk with each other rather easily.

Let's begin by looking at the basics of computer interface. I'm a big fan of the KISS principle (Keep It Simple and Straightforward) so I looked for the minimum equipment needed to get two computers to talk to each other. Simple communications like the ones we'll be discussing are based on the use of just three signal lines: a line on which to *talk*, one on which to *listen* and a *common* line for the sake of electrical completeness.

There are two complementary configurations for the standard RS-232 interface: DTE (Data Terminal Equipment) and DCE (Data Communications Equipment). As the name implies, Data Terminal Equipment consists of those devices operating as terminals, and Data Communications Equipment is comprised of those devices designed to communicate with the outside world. The two devices are actually *designed* to be directly connected to each other.

A modem is a typical example of DCE gear, and portable computers, such as the Tandy 102, are examples of DTE gear. When a computer is imitating, or *emulating*, a terminal, it is configured to operate as DTE.

Although this sounds complicated, all we are defining is how a computer *listens* for information and *talks* to other devices. For example, DTE hardware uses Pin 2 to send data, and DCE equipment uses that pin to receive data. So, when the two devices are connected, one talks while the other listens. In fact, both units can be talking *and* listening at the same time. Humans should be so lucky.

To get your CoCo to communicate

*Don Hutchison is an electrical engineer living in Atlanta, Ga. He works as a senior project engineer and is involved in the design of industrial control systems. On Delphi, Don is the Database Manager of the RAINBOW SIG. His Delphi username is DONHUTCHISON.*

# Telewriter-128™

## the Color Computer 3 Word Processor

### TELEWRITER: UNDISPUTED #1

If you've read the other word processor ads, you've probably had your fill of cold lists of features, and claims of ultimate speed, power, and ease of use. So let's try to get past the overblown claims and empty buzz words—with 2 simple facts:

Fact 1: Telewriter is undisputedly the #1 most popular word processor on the Tandy Color Computers.

Fact 2: Telewriter's exemplary ease of use and power have been acclaimed in numerous magazine reviews and in thousands of letters and calls from end users.

### THE OTHERS DON'T UNDERSTAND

So why has Telewriter gained such a large and loyal following, while other Color Computer word processors have come and gone? Ironically, our competitors' ads tell you *exactly* why.

For them, word processing is nothing more than features and numbers. The longer the list of features, and the bigger the numbers, the better the word processor. Or so they think.

They just don't understand that power and ease of use are not gained by tacking on random features or throwing in freebie utilities or forcing you to use a cumbersome mouse.

*Real* Power, *true* Ease of Use, and *genuine* Speed can only be attained through thoughtful, logical, intelligent design, attention to detail, and a commitment to the act and the art of writing. That's the Telewriter tradition, and that's the reason for Telewriter's phenomenal success.

### TELEWRITER—128: INTELLIGENT DESIGN PERFECTED

And now, Telewriter-128, the latest Telewriter, uses the added hardware power of the Color Computer 3 to bring this intelligent design to its logical perfection.

Telewriter-128 adds unsurpassed speed and important new features to the already impressive arsenal of Telewriter-64. Not just speed for speed's sake, or features for the sake of advertising—but speed where it counts and features that make you a more efficient, more effective writer.

*Rainbow magazine* put it this way: "Telewriter-128 will set the word processing standard for the Color Computer 3 because it is so simple and user friendly. . . . The 81-page tutorial/user's manual is nicely done. It is written in easy to understand language but the program itself is so easy. . . . Most people will be able to use the software right out of the package."

### TELEWRITER-128 OR DESKTOP PUBLISHING

Desktop publishing is nice for adding pictures and fancy fonts to newsletters or business presentations—but its graphics orientation sacrifices some important capabilities when it comes to working with words.

If your main concern is expressing ideas through words (notes, letters, reports, papers, novels, etc.), the dedicated word processing power of Telewriter-128 still provides the most efficient tool for the job. Each tool has its place—desktop publishing for striking visuals, Telewriter-128, for effective writing.

### TELEWRITER-128 OR TELEWRITER-64

You can no longer afford to be without the ease, power, and efficiency, that Telewriter brings to everything you write.

**Telewriter-128** for the Color Computer 3 costs $79.95 on disk, $69.95 on cassette.

For the Color Computer 1&2, **Telewriter-64** costs $59.95 on disk, $49.95 on cassette.

To order by MasterCard or Visa,
call **(619) 755-1258** anytime, or send check to:

**COGNITEC**
704 Nob Avenue
Del Mar, CA 92014

(Add $2 S&H. Californians add 6% tax. To upgrade from TW-64 to TW-128 send original TW-64 disk and $41.95.)

Telewriter is also available through your nearby Radio Shack Computer Center and participating Radio Shack stores and dealers—or order direct from Express Order by dialing **1-800-321-3133.**

Ask for: **Telewriter-128** (disk) . . . cat #90-0909
**Telewriter-64** (disk) . . . . cat #90-0254
**Telewriter-64** (cass) . . . . cat #90-0253

**FEATURES THAT MATTER:** Telewriter's outstanding design and its complete set of features, put it in a class by itself, for smooth, efficient writing and letter perfect printed documents. Telewriter-128 includes:

Unbeatable SCREEN PERFORMANCE: lightning fast paging and scrolling, on-screen text that never lags behind your typing, and a response that is always instantaneous, no matter how much text is in the buffer, or where you are in the document.

26 User definable MACRO KEYS type your often used phrases and titles with a single keypress—saving you time and freeing your concentration for writing. User settable DUAL SPEED CURSOR moves you anywhere on the line, on the page, or in the document, fast or slow—you decide, with the touch of a finger. Fast PRINT PREVIEW MODE shows you text as it will print: headers, footers, margins, page breaks, page numbers, justification—saves time and paper and guarantees perfect looking documents everytime.

Instant, ON-LINE HELP summarizes all Telewriter-128 commands and special symbols. The On-line OPTIONS MENU lets you instantly customize the writing environment at any time to suit your precise needs (Screen/character color, Monochrome on/off, Key repeat/delay rate, 2 Cursor repeat/delay rates, Case-sensitivity of search, Auto file backup on/off, and more). A SINGLE FUNCTION KEY takes you instantly to any menu, so you never have to stop and think.

The 24, 25 or 28 LINE SCREEN DISPLAY option lets you see 16% more on-screen text (28), or wider line spacing (25). The auto-loading OPTIONS FILE stores all your Macros, Print Format settings, and Options Menu settings, so they are always there everytime you run Telewriter-128. 3 pop-up STATUS WINDOWS tell you cursor position, word count, free space, etc.

The QUICK SAVE feature lets you instantly save your current document with just 2 keystrokes and without leaving the editor. CURSOR THROUGH DIRECTORY to Load, Append, Rename and Kill files—so you'll never type a filename after the first time. HANGING INDENTS help you organize ideas on the page more effectively. Also: Footers, Multiple Print, Print to Disk, Key Click, Key Repeat, 40/80 Column Option, Overstrike, Word Delete, Nested Macros, Definable Foreign and Math Symbols and more. . . .

And, of course, Telewriter-128 incorporates all the Features of TELEWRITER-64, like: Works with *absolutely any printer* that works with your Color Computer (1, 2, or 3). Uses simple Embedded Control Codes so *all* intelligent features of your printer are easily accessed, including: Underlining, Boldface, variable Fonts, Sub-script, Super-script, Italics etc.

Format commands allow dynamically changing Margins, Headers, Spacing, Centering, etc., anywhere in the document. Format menu sets Margins, Spacing, Page numbering, Baud rate, Lines per page, Justification. Chain Printing means the size of your printed document is unlimited. Also Single page and Partial Print.

Fast full-screen editor with wordwrap, text alignment, block copy/move/delete, global search and replace, wild card search, fast 4-way auto-repeat cursor, fast scrolling, forward and backward paging, settable tabs, word and line counter, full error protection. Insert or delete anywhere on screen. Simple, easy to remember, "mnemonic" Editor Commands. Load, Save, Append, Partial Save files to disk or cassette. Kill, rename and list disk files. ASCII file compatibility.

with another computer, you only need to run a cable between the two computers, using the necessary adapters. In addition, these computers will run the terminal program of your choice.

**Communicating with Another CoCo**

It is probably easiest to get CoCos to communicate with each other because, like their owners, CoCos are pretty gregarious. They like to get together and communicate, especially online on Delphi and at RAINBOWfests. They even exchange pictures.

It's a simple matter to connect two CoCos by using a cable to connect the two serial ports. Just *crisscross* the send-data and receive-data lines. In other words, connect the send-data line from one CoCo to the receive-data line on the other, and vice versa. When one CoCo talks on a signal line, the other CoCo listens.

To construct the necessary cable, use two four-pin DIN plugs (Part No. 274-007) and a suitable length of cable. The cable itself is not usually crucial in short-to-intermediate lengths, such as six to 15 feet. Electrically, the cable would follow as shown below:

| | CoCo 1 | CoCo 2 |
|---|---|---|
| Receive Data | 2 | 4 |
| Signal Ground | 3 | 3 |
| Transmit Data | 4 | 2 |

The Carrier Detect (CD) function, Pin 1, is not needed for most CoCo terminal programs. Although the popular terminal programs *GETerm*, *Mikeyterm* and *Rickeyterm* do *not* require a carrier detect signal to operate, some terminal programs *do* require the carrier detect line to be active. Because this function is normally provided by the modem, you must take steps to provide the carrier detect signal if you choose to use such a terminal program. Usually, the CD signal can be activated with a signal (such as DTR) that is obtained elsewhere.

After the computers are physically connected, simply load and run your favorite terminal program on each computer. This will allow you to transfer files back and forth. Pretty simple, huh?

I generally use the CoCo's standard four-pin DIN serial port for this type of communication because it is convenient. The serial port (on any model of CoCo) is adequate for the short files I transfer, and it usually operates reliably at speeds up through 1200 bits per second. The CoCo 3 is capable of operating at 2400 bits per second through the serial port; however, I've been able to use only 300-baud communications under OS-9 because of the increased system overhead.

Remember that several terminal programs will automatically sense the presence of an RS-232 pack, so remove it from your system before running the terminal program. *GETerm*, *Mikeyterm* and *Rickeyterm* all *auto sense* the RS-232 pack.

**Remote Connection under OS-9**

OS-9 offers a unique method for connection through the serial port. This operating system allows you to use a separate terminal (such as a Tandy 102) to access OS-9. When you are connected to OS-9 in this fashion, you can type on either the main CoCo keyboard *or* the remote keyboard. OS-9 will honor requests from either source. Although some things can't be done from the remote keyboard (like showing windows on a Tandy 102), it's still fun to use.

To link to OS-9, execute the `XMode` utility to configure the serial port for use with an external terminal. To configure the port for 300-bps, 8-bit, 1 stop bit, no parity, just enter the following:

```
xmode /t1 type=0 baud=1
```

Next, invoke `TsMon` (the Timesharing monitor) with the following line:

```
tsmon /t1 &
```

This tells OS-9 to start up `TsMon` as a concurrent process. At this point, press `ENTER` from the remote terminal or keyboard to initiate the OS-9 login sequence. If you successfully log in to the system, you'll be greeted in the following manner:

```
WELCOME TO COLOR COMPUTER
OS-9
OS9:
```

When asked for a username, press `ENTER` again. OS-9 will initiate the appropriate steps to enable access to the system.

I've found this a quick and convenient way to extract text files from an OS-9 disk onto another computer. Simply display the file(s) by entering the `LIST` command from the remote terminal or keyboard, and capture the text as it's displayed.

A better way to transfer files to and from an OS-9 disk is to use an OS-9 terminal program like *XTerm*. This method works better because the system overhead is too great to allow the operating system to service the serial port as often as required when using `TsMon` with `/t1`. The CoCo's serial port is not very useful under OS-9 at speeds above 300 bits per second.

This method is useful for those wanting to extract OS-9 text files from their CoCos and use them with portable computers. It's also convenient for those who prefer a Disk BASIC word processor like *Telewriter*. The text files can be edited using the method of your choice. However, don't forget that it isn't possible to transfer OS-9 binary files to a portable (or vice versa) and expect them to function correctly.

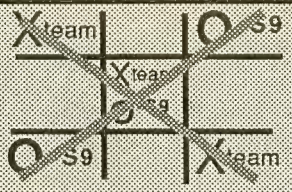
**Using RS-232 Packs**

Because the CoCo uses nonstandard connectors for its serial port, we'll need to look at ways we can communicate with devices that use standard connectors and interface requirements. I refer to the CoCo's serial port because this port is not a true RS-232 port. The RS-232 standard defines both signal levels and the control signals that should be present. Fortunately, the serial port is compatible enough to let us communicate with a wide variety of RS-232 devices.

It is easy to initiate communication between two CoCos if both are using RS-232 packs. Rather than using the cable described above, you'll use a standard RS-232 cable with male DB-25 connectors on each end. Your local Radio Shack sells the cable (Part No. 26-1408). Although it is called an RS-232-C cable for Model III/12, we will be able to use it with our CoCos.

We will also need a small device called a null-modem adapter. That's a rather intimidating term for a simple adapter that is used when no modem is available (hence the name null modem). The advantage of this device is that you can use the cable with your modem when communicating with Delphi, then unplug the cable and use it with a null-modem adapter to interface with another computer. Radio Shack sells a suitable null-modem adapter (Part No. 26-1496) for under $10.

# XTEAM & OS-9




# BOTH WINNERS

All of our OS-9 products work with:
OS-9 version 1
OS-9 version 2
OS-9 Level 2

## XTERM

OS-9 Communications program

- Menu oriented
- Upload/download Ascii or XMODEM protocol
- Execute OS-9 commands from within XTERM
- Definable macro keys
- Works with standard serial port, RS232 Pak, or PBJ 2SP Pack, Includes all drivers
- Works with standard screen, Xscreen WORDPAK or DISTO 80 column board

**$49.95** with source **$89.95**

## XDIR & XCAL

Hierarchial directory
- Full sorting
- Complete pattern matching

OS-9 calculator
- Decimal, Hex, Binary
- +,-,*,/,AND,OR,XOR,NOT

**$24.95** with source **$49.95**

## XDIS

OS-9 disassembler

**$34.95** with source **$54.95**

## HARDWARE

512k memory upgrade $124.95

Ram Software
- Ram Disk
- Print Spooler
- Quick Backup

All three for only $19.95

*Software by ColorVenture

## XWORD

### OS-9 word processing system

- Works with standard text screen, XSCREEN, WORDPAK, or DISTO
- True character oriented full screen editing
- Full block commands
- Find and Replace commands
- Execute OS-9 commands from within
- Proportional spacing supported
- Full printer control, character size, emphasized, italics, overstrike, underline, super/sub-scripts
- 10 header/footers
- Page numbering in decimal or Roman numerals
- Margins and headers can be set different for even and odd pages

**$69.95** with source **$124.95**

## XMERGE

Mail merge capabilities for XWORD

**$24.95** with source **$49.95**

## XSPELL

OS-9 spelling checker, with 20000 and 40000 word dictionaries

**$39.95**

## XTRIO

XWORD/XMERGE/XSPELL

**$114.95** with source **$199.95**

## XED

OS-9 full screen editor

**$39.95** with source **$79.95**

# AND FOR RS DOS ...

### SMALL BUSINESS ACCOUTING

This sales-based accounting package is designed for the non-accountant oriented businessman. It also contains the flexibility for the accounting oriented user to set up a double entry journal with an almost unlimited chart of accounts. Includes Sales Entry, transaction driven Accounts Receivable and Accounts Payable, Journal Entry, Payroll Disbursement, and Record Maintenance programs. System outputs include Balance Sheet, Income Statement, Customer and Vender status Reports, Accounts Receivable and Payable Aging Reports, Check Register, Sales Reports, Account Status Lists, and a Journal Posting List.

**$79.95**

### INVENTORY CONTROL/SALES ANALYSIS

This module is designed to handle inventory control, with user defined product codes, and produce a detailed analysis of the business' sales and the sales force. One may enter/update inventory data, enter sales, run five sales analysis reports, run five inventory reports, set up product codes, enter/update salesman records, and update the SBAP inventory.

**$59.95**

Call for package price

### PAYROLL

Designed for maintaining personnel and payroll data for up to 200 hourly and salaried employees with 8 deductions each. Calculates payroll and tax amounts, prints checks and maintains year-to-date totals which can be automatically transferred to the SBA package. Computes each pay period's totals for straight time, overtime and bonus pay and determines taxes to be withheld. Aditional outputs include mailing list, listing of employees, year-to-date federal and/or state tax listing, and a listing of current misc. deductions. Suited for use in all states except Oklahoma and Delaware

**$59.95**

### PERSONAL BOOKKEEPING 2000

Handles 45 accounts. Enters cash expenses as easily as checks. Handles 26 expense categories. Menu driven and user friendly.

**$39.95**

### ACCOUNTS RECEIVABLE

Includes detailed audit trails and history reports for each customer, perpares invoices and monthly statements, mailing labels, aging lists, and an alphabetized customer listing. The user can define net terms for commercial accounts or finance charges for revolving accounts. This package functions as a standalone A/R system or integrates with the Small Business Accting package.

**$59.95**

### ACCOUNTS PAYABLE

Designed for the maintenance of vendor and A/P invoice files. The system prints checks, voids checks, cancels checks, deletes cancelled checks, and deletes paid A/P invoices. The user can run a Vendor List, Vendor Status report, Vendor Aged report, and an A/P Check Register. This package can be used either as a standalone A/P system or can be integrated with the Small Business Accounting Package.

**$59.95**


# MICROTECH CONSULTANTS INC.

1906 Jerrold Avenue
St. Paul, MN 55112


*Dealer Inquiries Invited*
*Author Submissions accepted*
*OS-9 is a trademark of Microware*

**Ordering Information**

Add $3.00 shipping & handling, MN residents add 6% sales tax.
Visa, Mastercard, COD (add $3.50), personal checks.

**(612) 633-6161**

A null-modem adapter is just a small box with a DB-25 connector on each end and some internal wiring to facilitate communication between two devices. The adapter connects the necessary control signals of each computer to simulate a connection with a modem or other DCE device. Additionally, the adapter crisscrosses the send-data and receive-data lines so each computer can send and receive data on the appropriate lines. Without this adapter, things would be a bit more complicated.

To use this adapter, plug one end of the RS-232 cable into one of the RS-232 packs, plug the other end into the null-modem adapter, and insert the adapter into the second RS-232 pack. Crank up your favorite terminal program on each computer, and the two computers are directly connected and ready to communicate.

**Different Computers**

Most computers use a standard DB-25 connector to interface with the outside world. This is what I use when I want my Tandy 102 to talk to my Color Computer. To connect another computer to the CoCo's serial port, we'll need to construct a suitable cable. Specifically, we'll need a CoCo four-pin DIN plug on one end of the cable and a standard male DB-25 connector on the other end.

It is sometimes possible to find a usable cable at your local Radio Shack, but it is no longer a standard catalog item. If you choose to construct your own cable, here is the necessary equipment:

| | CoCo DIN | DB-25 |
|---|---|---|
| **Function** | **Plug** | **Connector** |
| Carrier Detect | 1 | - |
| Receive Data | 2 | 3 |
| Signal Ground | 3 | 7 |
| Transmit Data | 4 | 2 |

The Tandy 102, like many other computers, uses a maximum of seven pins in its RS-232-C interface port. The additional functions of Request to Send (RTS), Clear to Send (CTS) and Data Terminal Ready (DTR) are seldom required for the simple communications interfaces we're using. When we use a true RS-232 port, however, these signals must be properly connected. This is the function of the null-modem adapter.

You'll find some variation between the different computers regarding required control signals, so it's always best to consult the owners manual for each machine. If the other computer simply refuses to begin communication with the CoCo, experiment by connecting the DB-25 connector's Pin 20 to Pin 8. This sometimes forces the other computer to acknowledge a carrier detect signal, which in turn allows it to function correctly. Your owners manual should explain this.

As we did earlier, connect the two computers with the cable and null-modem adapter. Plug the DB-25 connector into the null-modem adapter, and plug the adapter into the other computer. Insert the four-pin plug into the CoCo's serial port and start up the appropriate terminal software for each computer.

If you choose to use your RS-232 pack to talk with the other computer, simply use the RS-232 cable and null-modem adapter as you would when using two RS-232 packs.

**MS-DOS Machines**

Interfacing to the PC-compatible machines involves a little trick, but the technique is still nothing exotic. Because the PC compatibles use a male DB-25 connector rather than a female connector for the RS-232 port on the rear of the computer, you must purchase a "gender-changer" adapter, which is available from Radio Shack for $7.95 (Part No. 26-1495). Use this with the null-modem adapter and either of the cables described (depending upon your particular hardware).

The shareware program, *ProComm*, is probably the most popular terminal program for the MS-DOS engines, yet it requires a little trickery to get it to work without a modem. We need to convince the terminal program that the carrier detect is active (as it would be if we were using a modem).

The easiest way to do this is to install a jumper from Pin 8 to Pin 20 inside the cable connector attached to the PC compatible. This jumper connects the DTR line from the PC compatible (normal when using *ProComm*) to the carrier detect (CD) input. At this point, *ProComm* is ready to communicate with the other computer. This type of trickery may be required when using other PC terminal programs as well. Check the documentation to be sure.

**General Notes**

Of course, hardware hackers will notice that a null-modem adapter could be incorporated into the design of the cable, and that a gender-changer isn't required for use with MS-DOS machines if you choose to replace one connector with another. However, the intent here is to use standard adapters and make the techniques available to most users.

If you plan on interfacing with a lot of other computers, I recommend that you purchase an RS-232 Mini-Tester from Radio Shack. This small unit, priced at $14.95, is a great time-saver. It gives a quick visual indication of the state of each line in the RS-232 interface using red and green LEDs.

It's usually wise to use terminal settings of 8-bit, 1 stop bit and no parity on each computer, because some terminal programs will not automatically adjust to these settings before beginning a file transfer. (These settings are required when using the popular file transfer protocol, Xmodem.) You must also use the same baud-rate setting between the two computers, or communications will be totally garbled and impossible.

Half-duplex operation is usually preferred, especially if two computer operators will be typing back and forth to each other. In half-duplex mode, the terminal software will *echo* each keystroke to its operator. On the other hand, if the computer is operating in full-duplex mode, the operators will type *blind* because they will have no way of seeing the characters they are typing.

If the two computer operators intend to type to each other, it's also wise to adjust the terminal settings to *insert-linefeeds* mode. If this isn't done, the lines may overwrite each other on the screen. The documentation for the particular terminal program will explain how to do this.

Finally, use protocol transfers *whenever* possible. Even when transferring ASCII text files, it's best to use an error-checking protocol such as Xmodem to provide maximum protection from errors.

Now you can connect your CoCo to your PC compatible. Enjoy the benefits of both machines with a wider selection of files.

*New faces, new places and a discussion on computer viruses*

# Haven't I Seen You Before?

**By Don Hutchison**
**Rainbow CoCo SIG Database Manager**

Effective this issue, I will be assuming responsibility for "Delphi Bureau" from **Cray Augsburg** (CRAY). Cray has been writing the column since April, 1986, and now retires with our thanks. Don't worry. Cray will remain as the technical liaison between Delphi and THE RAINBOW. If you have a topic that you would like covered in this column, please contact me through Delphi's Mail system under the username DONHUTCHISON.

**Person To Person**

Delphi's newest SIG, Person To Person, is now open. This newest SIG is intended as a place for people to meet. It is accessible from the Entertainment menu, and can be found by typing GO ENT PER from almost anywhere in the Delphi system. SigOp **Shannon Yoffe** (SHANNONY) cordially invites everyone to stop by. Just sit anywhere.

One of the features of Person To Person will be the photo library. We're encouraging our members to post pictures of themselves in the database for others to view. Naturally, not everyone can digitize his or her own picture, so we have arranged for that to be handled for you. **James Farmer** (MODEMMASTER) will be more than happy to digitize your photo and post it in the SIG's database. James just needs a good photograph (the bigger the better), and he'll take it from there. Send your photo to James Farmer, 5311 Barwick Road, N. Charleston, SC 29418. If you want your photo returned, please include an SASE suitable for photos. Remember to add at least one sheet of cardboard or some other stiff material so your photo won't get crushed or bent in the mail.

James also invites calls from those who want more information about digitizing. You may contact him at (803) 552-2837. Please remember that this is in the Eastern time zone, and avoid calling during odd hours.

**The Portable Place**

After a bit of restructuring, the Portable Place is now open under the sponsorship of PCM. The Portable Place is dedicated to laptop computers such as the Tandy Model 100/102, 200 and 600, and the NEC portables. SIG staffers include **Marty Goodman** (MARTYGOODMAN) as house doctor, **Jim Reed** (JIMREED) as key grip and me as chief engineer. We cordially invite you to stop by.

In cooperation with PCM, THE RAINBOW's sister publication, we will have available the programs for portables from PCM ON DISK. We plan to post these files each month in a special topic of the database, where they will be available for instant access via downloading. These programs will each carry a $3 surcharge.

**View Master**

**David Mills** (DAVIDMILLS) has posted an outstanding graphics-viewing utility on the CoCo SIG. David's program, *View Master*, allows a CoCo 3 user to view most popular types of pictures using a *single* program. No more scrambling around when you want to view a particular picture — just run *View Master*. Look for it in the CoCo 3 Graphics topic of the CoCo SIG's database, and in the General topic of the database inside People To People.

**Viruses**

Lately, there has been a lot of publicity about the computer hazards known as *viruses*, *time bombs*, *Trojan horses*, etc. Do viruses really exist?

Yes, definitely. Some, of course, are tamer than others. We've all heard stories about a bank programmer who installed a short program into the bank's system which transferred fractional-cent values into his own account. When discovered, he had more than $30,000 in his account, which had accrued simply from the interest calculations on passbook savings accounts.

*Don Hutchison is an electrical engineer and lives in Atlanta, Georgia. He works as a senior project engineer involved in the design of industrial control systems. On Delphi, Don is the Database Manager of the RAINBOW CoCo SIG. His Delphi username is DONHUTCHISON.*

## Database Report

The General Information topic of the database includes **Chris Burke** (COCOXT), who uploaded a product announcement for Burke & Burke's new *RSB* (which lets you run Disk BASIC programs under OS-9 Level II), and **Brian Wright** (POLTERGEIST), who uploaded a text file that describes some bugs in the Microware C compiler.

In the Applications topic of the database, **Paul Jerkatis** (MITHELEN) posted a *StarTrek* program in BASIC09. **Robert Grubb** (GRUBBY) uploaded a BASIC09 program for determining loan payoffs, and **Steve Clark** (STEVECLARK) posted an electronic mail system — including the source code.

In the Utilities topic, Brian Wright provided us with a disk editor for OS-9 Level II, which was written by Pete Lyall. **Jeff Blower** (SEBJMB) posted *SetColor*, a utility that enables the user to change foreground, background and border colors by pressing a single key. **Mike Stute** (GRIDBUG) posted a clever utility called *Insulter*, which randomly displays insults to the user, and **Brian White** (BRIANWHITE) sent us a program that will duplicate a file or directory at another location on the same device. It uses an OS-9 feature not implemented by other commands.

Brian Wright also uploaded a text file by Pete Lyall in the Patches topic of the database. This file describes how to modify the RS-232 pack to enhance telecommunications or use with an external terminal. Brian posted another file from Pete Lyall that will patch ACIAPAK's variable

However, authors of viruses for personal computer systems are probably out to destroy your data.

Just what *are* these things, and what can we do about them?

A computer virus is usually a small program that is hidden in some manner. (It may even be a part of a larger, innocent-looking Trojan horse program. An earlier name for computer viruses was *worms*.) A virus has the ability to duplicate itself and to travel to another computer through the transfer of disks or by electronic means. It may have the ability to hide within your computer for days, months or even years before activating itself. Maintaining good backup procedures doesn't prevent viral spread, because a timed release virus can also be in the backup disk or tape. Therefore, the virus is capable of destroying your data time after time.

Although Trojan horses are usually programs designed to transmit a virus into computer systems, they may be destructive programs on their own. Just as the ancient Greeks captured Troy by hiding hundreds of soldiers inside an innocent-looking wooden horse, such a

space to allow more efficient I/O at speeds above 1200 bps. **Merle Kemmerly** (TOOK3) posted a patch, for ACIAPAK under Level II, that increases the input buffer to 140 bytes to help those operating at the faster baud rates. **Dave Philipsen** (DPHILIPSEN) posted a file to fix the seven-bit Xmodem bug in version 1.0 of the terminal program, *SuperComm*. For the *Microscopic Mission* game Robert Grubb posted a patch file that allows the game to run from the current execution directory. (This also allows it to run from a hard disk.) **Larry Oheron** (LOHERON) sent us a file describing how to set up *DeskMate 3* to run from a single disk.

The Telcom topic gives us Merle Kemmerly, who uploaded Version 3.2 of the popular terminal program *Telstar*; **Jim Hollier** (PGJIM), who posted Version 3.1 of *Jterm*; and Dave Philipsen, who uploaded *SuperComm*.

In the Graphics & Music topic, **Mike Knudsen** (RAGTIMER) uploaded his arrangement of a familiar tune. **Dennis Weldy** (OS9ER) uploaded a revised version of QuadDump, a printer driver for the Quad Jet color printer. Steve Clark posted a tongue-in-cheek drawing of the Color Computer and its Multi-Pak Interface.

The Programmers Den topic includes Brian Wright, who uploaded a file that describes the inner workings of the *Citadel* BBS package and the source code for that package. Mike Stute uploaded Part 2 of the C standard library.

In the Tutorials & Education topic, Mike Stute sent us an article on dynamic allocation and doubly linked lists. Brian Wright uploaded a tutorial on OS-9 concepts, while **Andrew Ellinor** (CROPPER) sent us his text file containing an introduction to OS-9. **Kevin Darling** (KDARLING) posted a text file concerning the Multi-Pak Interface and the Deluxe RS-232 Pak.

### CoCo SIG

In the CoCo 3 Graphics topic, **Mark Garbarini** (FI9) posted a picture of a sunset. I uploaded the CoCo Gallery Live pictures from the Chicago RAINBOWfest. **Donald Ricketts** (STEVEPDX) uploaded approximately 60 digitized images that he had converted from DS-69B format into *CoCo Max 3* files. Donald's pictures are always quite popular. David Mills posted a *very* popular viewing utility that will allow its user to view *all* major types of picture files. David also uploaded another adult picture from Brad Bansner. **John Barrett** (JBARRETT) posted several pictures of his favorite rally cars, and **Richard Trasborg** (TRAS) uploaded over one megabyte of clip art for use with *Max-10*. These files, drawn by Mike Trammell, have been very popular.

The Source for 6809 Assemblers topic of the database gives us **Mike Ward** (MIKEWARD) uploading the source code that details how to perform disk I/O from assembly language. This file will be extremely popular with all aspiring assembly language programmers.

In the Utilities & Applications topic, **Stephen Macri** (DRACMAN) uploaded his *Alicia Calendars* programs. **Robert Pierce** (RPIERCE) posted a revised version of his popular disk editor and a 51-by-24 Hi-Res screen driver for the CoCo 1 and 2. **Tom Wyrick** (WYRICK) uploaded a program to assist in converting CoCo BASIC programs into IBM-compatible ones. **Mike Sweet** (DODGECOLT) sent us his favorite disk editor, and **Jim Shoop** (BAZAR) uploaded a patch for *MAX-10* to eliminate the need to use the "clicker." While Brian White posted a high-speed disk backup utility, **Pierre Salvail** (PSALVAIL) sent us a useful smooth-scrolling utility for the CoCo 3. **Seth Short** (SETHSHORT) provided a universal picture conversion utility. **Fred McDonald** (FREDMCD) sent us a program for printing large banners on your printer and a search program for cross-referencing BASIC programs. Richard Trasborg uploaded a VCR tape-cataloging program written by his wife. Finally, **Billy Passauer** (INDIANABILL) uploaded Version 1.5 of the *File Copy Express*, a utility that allows wildcards during the copy operation.

In the Hardware Hacking topic, Marty Goodman sent us a file describing a bug in the RS-232 Pak and how to fix it. **Bob Smith** (HIBARBAREE) sent us a file describing how to use a Diablo printer with the CoCo, and Robert Pierce sent us a *CoCo Max 3* picture containing a CoCo 3 memory map.

The Games topic includes **Colin McKay** (COLINKCKAY), who uploaded his *Racko* and *Sea Battle* games, and Tom Wyrick, who posted a dart game and a *Wild Party* game.

In the Classic Graphics topic of the database, Tom Wyrick uploaded his graphics editor, and I was busy posting the CoCo Gallery pictures for September '88, as well as those published from October '85 to May '86.

The Music & Sound topic gives us **Mike Carey** (SPOOLFRAME), who uploaded fifteen more of his very popular *Lyra* files, and Mike Stute, who posted two more of his personal favorites.

In the Product Reviews & Announcements topic, Chris Burke uploaded a product announcement for the new Burke & Burke *RSB*. Donald Ricketts posted his review of the CoCo 3 version of *VIP Database*.

In the Data Communications topic, Tom Wyrick uploaded a data communications course composed of several BASIC programs, and a driver package for would-be BBS SysOps. **Robert Combs** (ROBCOMBS) uploaded two versions of *Phone Clone*, one for each model of CoCo 3. Rob also sent us *MultiLink*, a program to link the serial port with an RS-232 pack and enter a CB mode. Donald Ricketts uploaded a patch for *Ultimaterm* to adjust the program for 40-track disks.

program can wreak havoc within your system.

Another hazard, the time bomb, is a program that *blows up* a computer system after a certain interval of time following its installation. A programmer who was fired from a company might leave such a bomb in the system as a form of revenge. These bombs may do relatively simple things (like displaying a clever message on the programmer's birthday), or they may maliciously destroy thousands of important records. Some time bombs will activate themselves at repeatable intervals (like every two or four days after a disk has been infected). The results are varied, but they may include any of the following: printer/display problems, system crashes, or the malfunction of peripherals.

Viruses have been reported for all major brands of computers. Currently, those with IBM compatibles are the most vulnerable, but the potential threat is very real. One factor on our side is that viruses must be specific to the particular machine. (For example, an IBM virus cannot install itself into a CoCo environment.)

In practice, a user is not totally safe unless he never uses his computer. The possibility of a computer viral infection cannot be completely eliminated.

While there are all sorts of infectious agents that can invade your computer, the CoCo is more resistant to such attacks than many other machines. Because the CoCo uses a ROM-based operating system and the system exists as unalterable firmware, permanent change is virtually impossible. This provides a great deal of security for most CoCo users.

The CoCo 3 is a slightly different case since the operating system is transferred to RAM at start-up. This makes it vulnerable to modification by a virus program. It would be rather easy, for example, to patch the CoCo 3's operating system and destroy the allocation tables and/or directory of a disk after a certain time or after a certain number of disk accesses. Fortunately, the CoCo 3's operating system is "refreshed" at each cold start, so a virus couldn't live permanently in this system as it could on other systems.

Those of you using OS-9, however, *are* susceptible to viral infection. Because OS-9 is a disk-based operating system, it is as vulnerable as MS-DOS or any other disk-based operating system. At present, there are no authenticated reports of a CoCo *OS-9 virus.* Much of this can be attributed to the CoCo OS-9 user, who is usually more interested in the operating system itself rather than in childishly damaging someone else's system.

Although real viruses have been created for MS-DOS machines, these are somewhat rare. Generally, when someone *thinks* a problem is due to a virus, it is actually due to software misuse, damaged software or a hardware failure of some sort.

Since viruses can be created to merge with and contaminate the operating system in any of a number of ways, there does not seem to be any practical means of "protecting" our users against possible viruses. All we can do is carefully examine any report of problems that might be associated with a program someone has downloaded from the database. Please notify the SIG staff if you suspect a program may be other than what it appears. We'll all be glad to help out.

See you online on Delphi!


## The CoCo XT and CoCo XT-RTC Hard Disk Interfaces

**The CoCo XT interface uses advanced "NO HALT" hard disk controllers, which do not halt your CoCo and do not disable or use interrupts during hard disk access. You get full type-ahead, and the system clock does not lose time during hard disk access. Fully compatible with most RS-232 expansion ports!**

***Great for Multi-User Systems***

**The CoCo XT hard disk interface lets you connect up to 2 low cost, PC compatible 5-120 Megabyte capacity hard drives to your CoCo. You buy the drive, Western Digital WD1002-WX1 or WD1002-27X (RLL) controller, and a case from the PC dealer of your choice. Just plug them into the CoCo XT, plug the CoCo XT into your Multi-PAK, and you have a 20 Meg OS9 hard disk system for *under $450!***

**We've sold hundreds of these affordable, high-performance hard disk interfaces to a very hot Color Computer market in a single year! This year, 1988, is "The Year of the Hard Disk" at Burke & Burke.**

***CoCo XT*** **(with anodized housing, 60 page user manual, hard disk back-up utility and new, Version 2.3 drivers for use with both *HYPER-I/O and OS9*) $69.95.**

***CoCo XT-RTC*** **(same features as the CoCo XT, and includes a real-time clock / calendar with battery backup) -- $99.95**

***THE PROFESSIONAL TOUCH: XT-ROM*** **-- Automatically boots and reboots OS9 from hard disk. Installs in your hard disk controller's BIOS ROM socket -- $19.95.**

## HYPER-I/O: BASIC runs hard drives, big floppies, and more!

**You or someone that you know may have the 35 Track Blues. It strikes hundreds of CoCo users every year. One day you wake up, and say to yourself, "These 35 track floppy disks are just too small." There's only one cure. More storage. Get it. With HYPER-I/O, from Burke & Burke.**

***Now compatible with DISTO and LR Hard Disks***

**HYPER-I/O modifies the RS-DOS Disk BASIC in your CoCo 1, 2, or 3 to provide a "Dynamic Disk Interface". Use your existing BASIC and RS-DOS software with hard disk interfaces (CoCo XT, DISTO, LR), RAM Disks, and any mix of floppy drives from 160K to 720K each. Fully RESET protected, user configurable, expandable, OS9 compatible, EPROM-able HYPER-I/O is becoming the system of choice for the CoCo 1, CoCo 2, and CoCo 3. *HYPER-I/O Version 2.6* now available only $29.95. *HYPER-III* (RAM Disk and Print Spooler for CoCo 3 HYPER-I/O) --$19.95**

## Check out these OS9 Utilities

***Tools to let you spend less time fighting OS9, and more time using it.***

**Wild & MV Version 2.1** Use "wildcards" with most OS9 commands, or rearrange your directory tree. Features recursive directory searches. A hard disk must! **$19.95**

**EZGen Version 1.04** Powerful OS9 bootfile editor. Change module names, add or delete modules, patch bytes, or rearrange modules. Works on other files, too. **$19.95**

**Burke & Burke**

**P.O. Box 1283 Palatine, IL 60078-1283 (312) 397-2898**

MasterCard VISA

ILLINOIS RESIDENTS PLEASE ADD 7% SALES TAX. COD's add $2.20. Shipping (within the USA) $2.00 per CoCo XT; $1.50 per disk or ROM. Please allow 2 weeks for delivery (overnight delivery also available for in-stock items). Telephone orders accepted (312) 397-2898.

RAINBOW CERTIFICATION SEAL

*You see the glamour, let me tell you about the work . . .*

# So You Want to Be a SysOp

## By Dave Jenkins

Many bulletin board users consider becoming a System Operator (SysOp), and some will start BBSs. Often, however, these new SysOps grow discouraged by the unanticipated problems and time demands of a properly running BBS. This article is intended to help the prospective SysOp make an intelligent decision.

As a potential SysOp, you must have the right personality and experience before going online. You need the patience to answer questions from users. Perhaps you've answered that same question a hundred times before, but the person asking doesn't know that. You also need to know how to program, and how to use such things as a disk zapper. A little electronics knowledge can also be helpful.

You should have plenty of spare time — being a good SysOp takes a lot of time. I spend about an hour a day working the system, and an additional two or three hours updating files on Sunday mornings. Because most people don't have a large enough system to adequately run a BBS, you may need to update your equipment, so you'll need some money. You'll also need a second telephone line, which (depending on where you live) can be expensive.

Before you decide to put a BBS online, you should ask yourself if you really want to do this. Don't answer too quickly. Remember

*Dave Jenkins is an engineer at WNIN-TV/FM in Evansville, Ind. He has been a System Operator for four years and is BBS section leader on Compu Serve's CoCo Forum.*

that your computer will be tied up while the BBS is online. When you want to use the computer, someone will probably be online. If you are into gaming, or use your computer for many other things, you will probably regret starting a BBS.

You must also remember that most areas have several BBSs. If you want to be a success, you must find a need and fill it. Don't duplicate the other BBSs in your area. Find out what is needed in the community and do that. For instance, in my area no BBS supported graphics in a format that several computers could use. I started putting RLE (run length encoded) graphics online. These can be viewed by almost all the popular home computers. This has been very popular, and other BBSs in town have started posting RLE graphics as well. You might also want to offer online games, role playing games, specialized message bases or downloads.

**Choosing Hardware and Software**

You need to decide what hardware and software to use. If you have a spare computer system sitting around gathering dust, it would be a prime candidate to run your BBS. I don't suggest putting new hardware online until you are certain that it works properly. An online BBS is a poor place to discover manufacturing defects.

If your software supports it, I recommend going with a 300/1200-baud modem. The 1200-baud modems cost less than 300-baud modems did just a few years ago. About one-third of the users on my system are 1200 baud, and more are moving in that direction. (In fact, if your hardware and budget can support it, I would go with 2400-baud service.) You should support at least 300- and 1200-baud modems. Get a fully Hayes-compatible modem. The Hayes command set has become a de facto standard among modems, and it cannot hurt to follow the standard. You may be able to get by without it, but it may hinder a future upgrade. It is cheaper to buy it now than to buy a second modem later.

You can find BBS software in two ways: shop for commercial BBS software or download free BBS software from Delphi or other networks. In either situation, talk to SysOps who use the software for an accurate judgment of the software's quality. Software sold commercially is not necessarily bug-free. Call running BBSs to get a feel for the software from a user's standpoint. No matter how you find the software to run your BBS, it should support Xmodem up- and downloading. Your system will be severely restricted without it.

A good BBS should have at least four drives. Although I have run systems with two drives, and you can start at that point, you should expand to as many drives as possible. No BBS in existence has too much storage space. The more you have, the more you can offer your users. Plan to continue upgrading your system.

A 64K CoCo makes an excellent BBS computer, particularly when it is outfitted with the RS-232 pack. A 512K CoCo 3, which allows two RAM disks online, is also an excellent choice. My system is a 512K CoCo 3 with a Multi-Pak Interface, an RS-232 pack, four floppy drives and an Avatex 1200 modem. My future upgrades will include moving to either double-sided or quad-density disk drives and the OS-9 operating system. The upgrading never ends.

You might want to buy a used system from someone for your BBS. If you can find the right package deal, you can get a system going for a reasonable price


Looking for "The Answer"?

Gain access to the vast warehouse of information stored in your "non-conscious" mind through your computer keyboard.

There are mini-programs or circuits in everyone's "non-conscious" mind which will enable them to accomplish remarkable things. In order to utilize these mini-programs, a bridge of communication must be established between the conscious and the "non-conscious" parts of the mind. Six years of research and development have resulted in a proven aid for establishing this bridge.

"The Answer" is a software package which aids you in communicating with your "non-conscious" mind to solve questions and difficult problems in a question/answer format. It utilizes graphics and optional user-programmable subliminal messages to strengthen the communication bridge.

Ask your questions...seek the answers...*EXTERNALIZE THE RESULTS* via automatic disk-stored record and optional print-out.

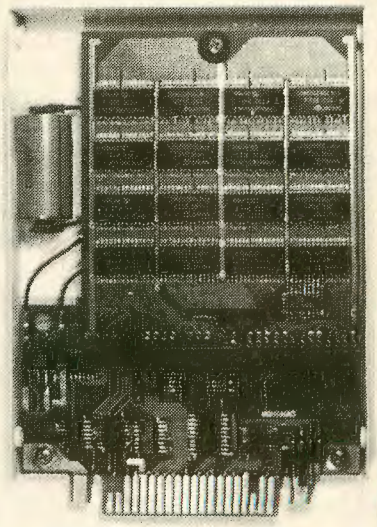
Order now for only $29.95 (+ $3.00 S/H) No COD's.

*"Turn on your computer and turn on the power of your mind!"*

CALL (317) 962-6644 TO ORDER
Alpha - Biotechnologies, Inc.
P.O. Box 2203 • Richmond, IN 47375



SolidDrive™ by Vidicom Corp



SolidDrive™ - a ramdisk that doesn't forget! Fully Static, battery backed CMos ram makes SolidDrive™ ready to use instantly. You can forget formatting and copying work files to ramdisk then copying back your changes to floppy. You can forget fear of power failures. The instant power loss occurs, SolidDrive™ write-protects itself and your valuable work. SolidDrive™ gives you state-of-the-art surface mount technology. That's why we have the best guarantee in the industry - Two years limited repair or replacement! SolidDrive™ is compatible with Multi-Pak® and comes complete with OS9® Level I or II device driver, formatter and self-test software. Available in 512K and 1 Megabyte versions. Factory upgrades available for 512K version. RSDos Driver now available, treats SolidDrive™ as 3 or 6 SSSD RS devices (4-6,4-9), Disk loaded version free on request! 27C64 EProm version $19.00

SolidDrive™ by Vidicom Corp
512K (524,288 bytes) $395.00
1 Meg (1,048,576 bytes) $695.00
Please add $4.00 shipping
Arizona Residents add 5.5% Sales tax
Visa MasterCard orders welcome

SolidDrive™ is the fastest, most reliable long-term storage available to the small computer user!

Vidicom Corp 20 E. Main St. Suite 710
Mesa, AZ 85201 (602) 827-0107
Hours M-F 9:00 am - 5:00 pm MST

OS9 is the trademark of Microware Systems Inc and Motorola Inc. Multi-pak is the trademark of Tandy Corp.

and keep your CoCo as your main computer. Don't rule out systems from other manufacturers. You might find a great bargain and learn something in the process.

**Getting a Telephone Line**

Many new SysOps try to begin running their BBS on their residence telephone line. I do not recommend this practice. Some users will ignore or forget your hours of operation and call when the BBS is down. And, while your BBS is online, no one can call you.

Telephone company rules vary widely from area to area. Some companies try to charge BBSs business rates instead of residential rates. Try to get *measured service* for your BBS line. Measured service limits the number of free outgoing calls and adds a surcharge for each call made beyond that number. Since most, if not all, calls will be incoming, this should not be a problem. Please remember that some telephone companies will not allow a measured service line in your home if you also have a standard line.

You can save money on installation if you can do your own interior wiring. Telephone wiring is not difficult. There are several books available that explain how it is done. Our telephone company charges $36 an hour for installation, so it pays to learn how to do your own wiring.

Before going online, you must also decide whether or not your BBS is free to the user. Charging for access creates other considerations. Every subscription BBS SysOp I have talked to has problems with users sharing one password. I know of no solution to this problem except charging for connect time. You will also have to take care of bookkeeping and keep track of subscription expiration dates. If you charge for access, the telephone company may also consider your BBS a business and charge you business phone rates.

Require that callers use their full names online. While handles can be fun, they can create a lot of problems. Most BBSs in my area that allowed handles didn't stay online very long because of troublemakers who hid behind the handle. Requiring full names reduces problems.

**Ready to Go Online**

Let's assume that you have the hardware and software ready and the telephone line is installed. You're ready to go online. What problems can you anticipate?

First, you can expect hardware problems. Running a BBS puts a heavy strain on your equipment. Expect to have your disk drives aligned and cleaned at least once a year. The drives are the weakest point in your system because they are the only mechanical part. The rest of your system is electronic and should be fairly reliable, unless there is a lightning strike, overheating, or some other severe condition.

Get surge protectors for the power and telephone lines coming into your system. These devices may cost you $50 to $75, but the insurance is worth the investment. If it saves you from just one lightning strike, a surge protector will have paid for itself.

Your computer should not share an electric circuit with a heavy-duty appliance (i.e., your refrigerator, washer or dryer). These devices draw a large amount of current when starting, which reduces voltage and could cause a crash. You might also look into ventilating fans for the computer, especially during the summer in a room without air conditioning. Never cover the ventilation areas while the computer is on.

Unless you absolutely need it on, turn your monitor or TV off while the BBS is in operation. The screen images can *burn into* the CRT. This damage is permanent, expensive to repair and completely avoidable. One SysOp I know bought a used black and white TV to use as a monitor. It made an adequate picture, cost little and was a good choice for the purpose. He left it on all the time, but since it cost so little, he didn't care about raster burn.

A little electronics knowledge can help keep you online. For instance, if parts have visible damage (charring or swelling), knowing how to pull the cover off the equipment, recognize a damaged part and replace it can save you money and keep you online.

Develop a good relationship with the service manager at the nearest Radio Shack Computer Center. If your problem is relatively simple to fix and you bring the unit in for repair, the service manager may expedite the repairs for you. Be subtle when you make such a request. Instead of applying pressure, tell the manager that your BBS is down and that you need your equipment back as soon as possible. If you have a good relationship with the service center (and the shop is not overloaded) your repairs may be moved ahead. Remember, though, we all feel that our repairs are top priority, and sometimes we may have to accept the wait.

Preventive maintenance is also important. Every week, you should clean your edge connectors and your drive heads to prevent corrosion. Radio Shack chose not to use gold edge connectors. You'll need to turn off everything, take the disk controller apart and clean all the edge connectors by rubbing them gently with a pencil eraser. Do the same on the back of your drives. Clean your drive heads with a wet head-cleaning system. (The dry cleaners are abrasive and their use will shorten head life considerably.)

**Protecting Yourself From Trouble**

You have certain legal obligations as a SysOp. You are responsible for the messages posted on your BBS. Two SysOps in my area were convicted for allowing telephone access codes to be posted. Not only did they face jail sentences, they also had to pay thousands of dollars in legal bills and had to pay the telephone company involved $3,000 in restitution. Unless you like the idea of going to jail for your hobby, avoid posting credit card numbers and telephone access codes.

If you decide to post downloads, only post software and material that you *know* are either public domain or freeware. You may not post any of the following: software from magazines like THE RAINBOW, commercial software and copyright software not authorized to be posted by the author. Many people believe that if they download something from another BBS, they may post it on their own system. That is *not* true. It is entirely possible that a SysOp could be held responsible for lost sales if software is illegally posted. The risks involved are not worth the effort. Do not post anything uploaded to your BBS until you are sure you have the right to do so.

When uploading, watch for a Trojan horse. This is software disguised as one thing that is designed to do another — usually erase your disks. I have not run into this problem in the CoCo BBSs, but there are some nasty programs floating around the MS-DOS world. Test the upload thoroughly before posting it. Don't post anything that you have not personally run, unless you are confident of the source.

If you wish to post a file from one of the commercial online services (like Delphi) check with the service in question regarding its policies. If it finds that you are violating its rules, your membership can be revoked.

Try to establish friendly relations with other local SysOps. In our area, we

have formed a Council of SysOps. The purpose is to share information on problem users. In extreme instances, a user could be booted off every member system in town. We have no actual meetings. One of the boards has a message base restricted to SysOps, and we share information there. Don't war with other SysOps, if it can be avoided. Cooperation can help everyone.

I don't have a hard and fast rule about verifying users. My area doesn't have many problem users, (and the Council of SysOps keeps everyone informed about troublemakers) so I don't voice-verify unless something raises my suspicions. All users must leave their full names and addresses to gain access. Of course, someone could leave a phony name and address, and unless you verify you won't know.

You should make daily backups of your online disks. Sooner or later you will have a disk crash. I had a power line surge that wiped out all my online disks. Fortunately, I had backups from the previous night, so I went to those and left a message about "stepping into the BBS zone, moving back in time to yesterday." It is bad enough to have to use your backups, but it is embarrassing if your backups are a few days — or even weeks — old. Before going to bed, back up your disks. It is not a matter of *if* you will have a crash, but *when*. You will have a disk crash sooner or later.

Disks wear out. You can save a few pennies by buying bulk disks, but I have found that many of these wear out quickly. Computers are such popular items that discount stores often sell brand-name disks for as low as $6 per box of 10. Try to determine an average time that a disk will last on your system. Then, as a normal part of operations, replace your online disks *before* that time. For instance, if disks last eight weeks, replace them every six weeks. Keep the replaced disk for other things, but not for online use.

You may also run into a system crasher. Security is a function of software, but some BBS programs have *back doors* that allow someone to avoid the usual security. These back doors should be eliminated entirely. I am using the *CoBBS* system, which turns off the modem if BASIC is entered. I have also disabled all disk commands that are not used (such as DSKINI, DOS, DSKO$, SAVE, COPY, BACKUP and DIR). Even if users could get through to BASIC, they still could not read any files or even see a directory. Keep in mind, however, that no system is completely secure. Your best insurance against destruction is still frequent backups.

### A Few Final Tips

If you are still interested in running a BBS, I have a few suggestions that should make the responsibility a little easier. First, don't underestimate the intelligence of your users. They deserve your respect. Second, if you're going to take the BBS down to do something else on your computer, take the BBS phone off the hook and restrict your use to an hour or so. Incoming callers will get a busy signal (which indicates that the BBS is in use) instead of a ring with no answer (which indicates that the BBS is down). Third, keep in touch with the other BBSs in your area. Call them frequently, and read their message bases to find out what is on people's minds. Finally, have fun. □

*(Questions or comments concerning this article may be directed to the author at 1418 E. Illinois St., Evansville, IN 47711. Please enclose an SASE when requesting a reply.)*


E.Z. FRIENDLY For Your CoCo 1, 2, & 3

RAINBOW CERTIFICATION SEAL

EZWriter

"EZWRITER" does professional-quality letters quickly and easily. "EZWRITER" will automatically set the margins & characters per line, indent paragraphs, put your heading/greeting/closing in the right places, and even center the letter on the page! Just type your message and watch your DWP or DMP print a perfect letter!!! Handles 1 - 4 page letters, mailing lists, and labels. It will make it possible for you to send any number of copies with a salutation for each recipient!! Perfect for personal correspondence, for letters to club members, or for direct mail advertising. "EZWRITER" is by far our #1 Best Seller, and it's no wonder; it's the absolutely simplest letter writing system available for the CoCo! Still only $19.95 plus $1.50 S/H for either disk or cassette. GREAT on the CoCo 3 but will run on any CoCo with 32k ECB.

E.Z. FRIENDLY SOFTWARE
118 CORLIES AVE. • POUGHKEEPSIE, NY 12601 • (914) 485-8150
(Add $1.50 s/h to all orders. NY residents add state sales tax.)

**"I cannot imagine the CoCo 3 without ADOS-3; it would not be a complete machine."**
**The RAINBOW, July 1987**

You've moved up to a CoCo 3. A powerful new machine. Now, it's time to give BASIC a shot in the arm, with ADOS-3. Wouldn't it be nice to turn on your machine and be greeted by an 80-column display, in the colors of your choice, with your own custom startup message? To run routinely at 2 MHz (double speed) without having to slow down for disk and printer operations? This and much, much more is possible with ADOS-3, our CoCo 3 adaptation of the acclaimed original ADOS, which shares the original's virtual 100% compatibility with commercial software. After customizing ADOS-3 using the provided configuring utility, you can have it burned into an EPROM that plugs into the Disk BASIC ROM socket, or just use it in RAM as a disk utility. (EPROM + burning will cost $15-20; we provide information concerning how you can have this done.) Supports double-sided drives (35, 40, or 80 tracks). FAST and SLOW commands, auto line number prompts, RUNM command, keystroke macros, arrow-key scroll through BASIC programs, auto-edit of error line, and many more valuable features.

**"ON A SCALE OF 1 TO 10, I RATE ADOS-3 A SOLID 15." RAINBOW, 7/87**
Disk . . . $34.95 Original ADOS for CoCo 1 or 2 . . . $27.95 (See 6/87 RAINBOW review)
Original ADOS plus ADOS-3 .....$50.00

**THE PEEPER**
ML program tracer that multitasks with the target program. An excellent learning tool for the ML novice; an invaluable debugging aid for the expert. CoCo 1, 2, or 3 compatible.
Disk . . . $23.95 Assembler source listing . . . Add $3.00

**MONITOR CABLES for CoCo 3**
Magnavox 8CM515/8CM505/8CM643 . . $19.95 Sony KV1311CR . . . $29.95

SPECTROSYSTEMS
11111 N. Kendall Drive, Suite A108
Miami, Florida 33176
(305) 274-3899 Day or Eve.
No delay on personal checks • Please add $2.00 shipping • Sorry no credit cards or COD's.

*Reading for detail*

# You Can't Get There From Here

**By Steve Blyn**
**Rainbow Contributing Editor**

Many people do not realize that truly good readers train themselves to adjust their reading speed to suit each reading situation. Flexibility in approaching different kinds of reading materials requires training and practice. Like the driver of a manual-transmission automobile, a reader must learn to shift speeds at appropriate times.

A good reader learns to read faster when skimming and slower when reading for details. When skimming material, good readers do not read every word. They concentrate on reading for the thought or the main idea rather than on the indiviual words. Good readers also know that they must slow down their reading speed when details and concentration on the material are demanded. Words must be studied for their meaning; passages may have to be reread.

This month's article presents a reading exercise suitable for middle school to adult education students. Its concept and appeal are important at all stages of life, and the exercise affords practice in careful, detailed reading of a short passage.

The short story presented below requires slow, careful reading. In this age of fast food and instant anything, students often want immediate results from everything they do. It would be difficult to skim the passage below and come up with a suitable map of the story details. The story is constructed to force students to slow down and read the story carefully.

The following are the directions for this exercise and the passage to be read by the user:

Read the following short story carefully. Try to visualize the route of the car. Then draw a rough map of the route showing the landmarks that were mentioned.

Last weekend, we were driving north through a small, unfamiliar town. It was lunch time and we were getting hungry. We knew that in this town, there was a wonderful pizza restaurant on Main Street. We asked a young lady how to get there, and she gave us the following directions:

"You are now going in the wrong direction. You will be able to make a U-turn two blocks up this street. Then go south on this street until you pass a library on your left. Three blocks later, you will see a gas station on your right. Make a left turn at the next intersection. Go on for about twelve blocks until you reach the first traffic light. The road forks at the light. Take the right fork. Keep going until you reach the next crossroads. You will see a school on your left. Turn right at the crossroads, before you reach the school. You will then be on Main Street. The restaurant will be on your left a few blocks down the street."

Our program presents a low-resolution map of the story and illustrates the route that the car should take. On the left of the screen is a guide for counting the number of streets or blocks indicated.

Run the program after the student has read the story and produced a map. The computer screen is compared to the student's representation. The student should use this comparison to learn why any mistakes were made. Students may want to reread the passage after comparing their maps to the computer representation.

Have your students repeat the program after several days. You can then compare the results of the newly created map with the original. While slow, careful reading is not easily accomplished in our fast-paced society, results *should* improve with each succeeding session.

Use this program to produce other practice passages for your children or students. Alter some of the directions and make the necessary changes in the program for the new map. Better still, try to create a new town map with its own directions. We hope that you and your students enjoy and benefit from this program. See you next month. □

*Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He owns Computer Island and lives in Staten Island, New York.*

**The listing:** MAPPER

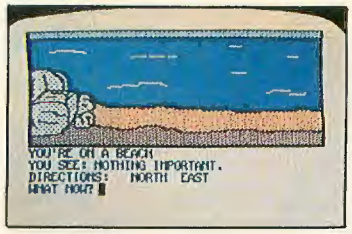
```
1Ø REM"VISUALIZING WHAT YOU READ
"
2Ø REM"STEVE BLYN,COMPUTER ISLAN
D,STATEN ISLAND,NY,1988"
3Ø CLSØ:PRINT@15,"N";
4Ø FOR T= 1Ø24 TO 153Ø STEP 32:P
OKE T,2Ø9:NEXT T
5Ø PRINT@73,"CAR";
6Ø PRINT@168,"LIBRARY";
7Ø PRINT@258,"GAS";
8Ø PRINT@24Ø,"LIGHT";
9Ø PRINT@375,"SCHOOL";
1ØØ PRINT@497,"PIZZA";
11Ø PRINT@398,"MAIN";:PRINT@43Ø,
"ST";
12Ø FOR T=1Ø96 TO 1Ø32 STEP-32:P
OKE T,241:PLAY"L3Ø;C":NEXT T
13Ø POKE 1Ø31,241
14Ø FOR T=1Ø3Ø TO 1286 STEP 32:P
OKE T,241:PLAY"C":NEXT T
15Ø FOR T=1287 TO 1298:POKE T,24
1:PLAY"C":NEXT T
16Ø FOR T=1298 TO 14ØØ STEP 33:P
OKE T,241:PLAY"C":NEXT T
17Ø FOR T=1247 TO 152Ø STEP 3Ø:P
OKE T,241:PLAY"C":NEXT T
18Ø EN$=INKEY$:IF EN$=CHR$(13) T
HEN CLS:END:ELSE 18Ø
```

Making a list? Checking it twice? Before you send it off to the North Pole you should check out our holiday shopping guide. If you've been very, very good, you might want to treat yourself (or a deserving fellow CoCoist) to some of the goodies — ranging from $7.95 to $699.95 — featured here.

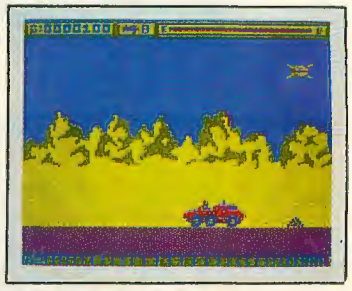
(See Page 118 for ordering information.)

# Rainbow's Holiday Shopping Guide

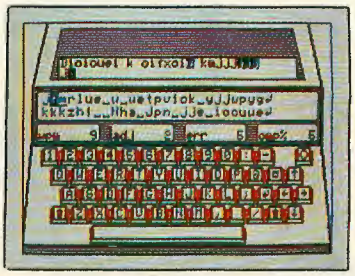
1



2


3

4


5

6

## CoCo 1 and 2

[1] Have a blast from the past with *Speed Racer*. Racer X, eat your heart out! From MichTron, on cassette and disk, $34.95. (Also works on the CoCo 3.)

[2] Can King William *never* rest? Join him in a trilogy of Adventures from RTB Software for the CoCo 1 and 2 only — *Labyrinth* ($24.95), *Quest for the Ring* ($34.95) and *Adventure in Lumeria* ($36.95). Here he is at the beach, attempting to cross the sea to save his lady fair.

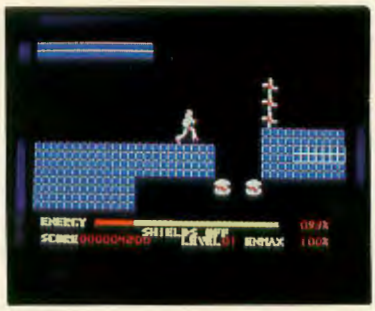
[3] Go lunar and drive for yourself an out-of-this-world set of wheels with *Moon Runner*. It's arcade action in orbit. (*Psst!*, also included is a version especially for the CoCo 3.) From Nick Bradbury, disk system only, $15.

[4] Deliver the ultimate parting shot with *Car Sign Designer*. The package comes with two reusable sign holders. From Zebra Systems for 64K CoCo 1, 2 and 3 disk systems, $29.95.

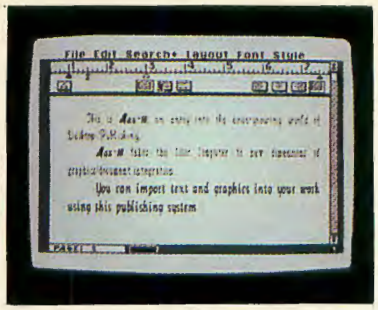
[5] Are you fumble-fingered? Is your wimpy wpm getting you down? Here's the cure — *TypeMate*, a typing tutor on a ROM pack from Tandy (also works on the CoCo 3). Available in Radio Shack stores nationwide for $24.95.

[6] Get a handle on CoCo 1, 2 and 3 data storage with Burke & Burke's *Hyper-I/O* ($29.95), a program that allows the use of 3½-inch floppy drives and hard drives under Disk BASIC *and* OS-9.

7



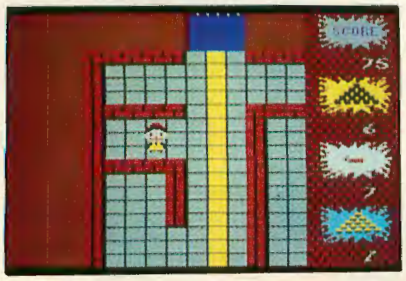
8



9

10

11



12

13

14

# CoCo 3

[7] Trigger happy? Our Business Assistant, Dawn Cecil, is. Here she is taking potshots at the screen with the *Iron Forest* phaser. If you feel you're up to zapping a few monsters in the mission to protect a sacred white dove, this game is for you. (The graphics and sound effects are great!) From Diecom Products for disk systems only: $29.95 U.S., $37.95 CDN; with phaser and interface, $74.95 U.S., $93.95 CDN.

[8] *Thexder* is the Number 1 arcade hit from the Land of Sushi and the Rising Sun. If you're into Transformers, you should like this game. From Sierra On-Line, available in Radio Shack stores everywhere, $24.95.

[9] Integrate text and graphics and dabble in new dimensions of desktop publishing with *Max-10*. It's menu-driven and requires a disk drive and a Hi-Res joystick or mouse. From Colorware, $79.95 plus $3 S/H.

[10] Feel like questing? Then go seek ye the Phoenix Crossbow in Sundog Systems' *In Quest of the Star Lord* ($34.95 plus $2.50 S/H). Requires disk drive.

[11] Based on the ancient game of mah-jongg, *Shanghai* is a brain-teaser for those who don't give up easily. It's on a ROM pack from Activision for $34.95: Available in Radio Shack stores nationwide.

[12] Ever get the feeling you're lost in a maze and being chased by ugly monsters? Perhaps you've been playing *A Mazing World of Malcolm Mortar* in your sleep. On a ROM pack from Tandy for $29.95: Available in Radio Shack stores nationwide.

[13] Dive into a mouse- and menu-driven programming environment for Enhanced Color Disk BASIC with *Window Master*. It requires 512K and adds more than 50 commands and functions to CoCo 3's BASIC. From Cer-Comp, $69.95 plus $3 S/H.

[14] If you're in the market for 80-column, menu-driven CoCo 3 word processors, you might check out *Word Power* 3.2, which features a print spooler, spelling checker and split-screen editing. From Microcom Software, $79.95.

15

16

17

18

19

# Hardware

[15] You might want to hold off on that new floppy drive you're planning to buy — Arizona Small Computer Peripherals is selling full-height hard drive kits that come with drive, SASI controller, power supply and cables. You supply the case and interface. Available in 5-Meg ($120), 8-Meg ($140) and 10-Meg ($160) models. As a bonus, some public domain software is included. The drive shown here is in a case and has a controller attached.

[16] Here's a trio of goodies for any serious computer buff. CRC/Disto's Super Controller II ($130) offers souped-up I/O and extra care for OS-9 operations. The EPROM programmer ($54.95) can attach to the Super Controller and "burn in" favorite utilities. The RS-232 SuperPack ($49.95 — requires Multi-Pak) offers CoCoists an RS-232 serial port.

[17] If it's a self-centering joystick you want, here it is, the ComMander Deluxe Joystick — with its four firebuttons for lefties and righties both. The joystick was designed for other computer systems but has been modified by CRC/Disto for the CoCo's joystick ports. From CRC/Disto, $29.95.

[18] You ought to be in pictures. And if you have a CoCo 3, a video camera, disk drive and a Multi-Pak — you can be. The DS-69B Digisector pack shown here with our Customer Service Manager, Beverly Bearden, is sold by The Micro Works and costs $149.95.

[19] Oh say, how cheaply can you see with this 12-inch, 80-column-capable green-screen monochrome monitor? Only $67.50 plus $7 S/H. Sold by Howard Medical Computers.

[20] If you have data that's too important to lose, spring for Solid Drive, a static RAM disk that write-protects itself on power loss. It includes OS-9 and Disk BASIC device drivers and requires a Multi-Pak. From Vidicom Corp., available in 512K ($395) or 1-Meg ($695) version.

[21] How about it, CoCo 1 and 2 users? Here's the ultimate upgrade — Tandy's 128K Color Computer 3 ($129.95) and a CM-8 RGB monitor ($299.95) to take advantage of its native 64 colors and 80 columns, and an FD 502 single disk drive ($199.95). See what memory and Hi-Res graphics can do.

20

21

22

23

24

25

26

27

# Accessories

[22] Here's an assortment of accessories to make the computing life a little easier. The DM-8 printer stand from Datum Manufacturing ($14.95) allows anxiety-free printer relations; tractor-feed paper can be stored snag-free underneath. The Curtis Copy Clip ($6.95), a reversible copy holder from Curtis/PCA, keeps your eyes monitor-level; it attaches to the monitor with velcro and folds back out of the way when not in use.

[23] Don't let one bump in the night cost you $$$$ — get an MPI-CoCo Locking Plate from Gimmesoft ($7.95) and keep your CoCo 3/Multi-Pak connections solid. Comes in two styles.

[24] The ultimate off-line utility — *DELPHI: The Official Guide* — will get you acquainted with every aspect of the Delphi online information service in its 488 pages. From Simon & Schuster, $21.95.

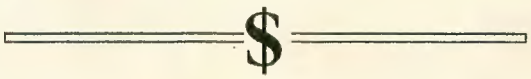
[25] The MS-500 monitor stand from Datum Manufacturing ($17.95) saves desktop space and adds a touch of class to your CoCo setup.

[26] Set your own style with Foto-Wear!'s iron-on transfer paper. Print a graphic using a color printer — or color a black-and-white printout with crayons — and iron it onto a cotton garment. This T-shirt shows the possibilities. Four-transfer pack, $9.95; 10-transfer pack, $19.95.

[27] A gift subscription to THE RAINBOW and RAINBOW ON TAPE or DISK is a gift that keeps giving the whole year round. RAINBOW's OS-9 books, the binders, the Adventure books and other entries in the RAINBOW Library make nice gifts, also. See pages 10, 12, 24, 50, 51 and 112 for more information on ordering these items.

*Wall Street comes to your CoCo screen with this game of luck and skill in buying and selling stocks*

# Playing the Stock Market



**By Mark Webb**

*Stock Ticker* is a Simulation game of buying and selling stocks, collecting dividends and becoming wealthy. There are two versions of the program. Listing 1, STOCKS3, will work on any CoCo 3 with 128K, an RGB monitor and one joystick. Listing 2, STOCKS2, will run on the CoCos 1 and 2 and requires at least 16K ECB of memory.

STOCKS3, the CoCo 3 version, is menu-driven and uses the right joystick to execute commands. STOCKS2, the CoCo 1 and 2 version, uses the following keys for game play:

| | |
|---|---|
| H | Help Screen |
| C | Original buy for playing against the CoCo (HAL) |
| A | Autoroll |
| S | Sell stocks |
| Q | Quit Autoroll |
| B | Buy stocks |
| Space bar | Roll (single) |

Also, in the CoCo 1 and 2 version: Pressing the up-arrow key allows the next player to buy stocks without rolling and affecting the stock values. This allows each player to buy stocks at the same price and can only be used at the beginning of the game. If you are playing against the CoCo (called "HAL" and only available in the CoCo 1 and 2 version), press C when it is CoCo's turn to do the initial buying.

The available stocks are as follows:

GO = Gold
SI = Silver
OI = Oil
BO = Bonds
IN = Industrial
GR = Grain

CoCo 3 version only:
FO = Forestry
SP = Space

Both versions of *Stock Ticker* are designed for up to four players. The object of the game is to buy and sell stocks so that you accumulate more wealth by the end of the game than any other player. Each player begins the Simulation with $10,000 and may purchase stock at the start of the game at par value (e.g., $2,000 will buy 2,000 shares of any stock at the start of the game.) It is not necessary to spend all of your money at once, though after the first player rolls, the prices may change. However, you can buy and sell any time it is your turn. An Autobuy feature is included which can be used to buy stocks for you automatically when you have enough money. By using Autobuy, you can select any of the stocks you want it to buy for you. You can even select *all* the stocks, sit back and watch your money roll in! Stocks can be "turned on" or "off" as many times as you want when it is your turn. The Roll option will roll just once for you and then stop. Autoroll will keep rolling until the joystick button is pressed on the CoCo 3 version or Q is pressed on the CoCo 1 and 2.

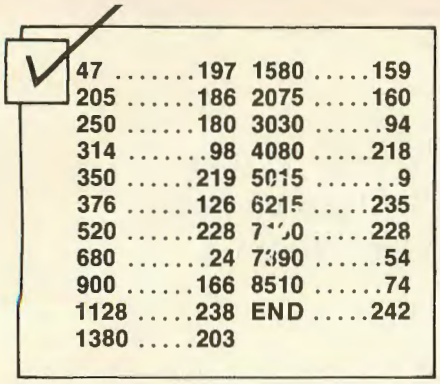
The computer sounds a notice when a stock has declared a dividend and is at or above par value of 100. At this point players are paid a dividend amount depending upon how many shares of that stock they own. If a stock rises above 200, all players holding shares in it are granted a two-for-one split, and the stock is restored to a par of 100. If a stock crashes, or falls below zero, then players unfortunate enough to be holding that stock lose all their shares of it.

The game ends when the number of rounds winds down to zero. When that occurs, the computer calculates each player's gross worth at game's end and displays it on the screen. A 500-round game can be played in 45 minutes to an hour.

*(Questions or comments concerning these programs may be addressed to the author at P.O. Box 793, Gold River, B.C., Canada V0P 1G0. Please enclose an SASE when requesting a reply.)* □

$$$$$$$$$$$$$$$$$$$$$$

*Mark Webb is a computerist by both vocation and avocation. He runs the chemical-plant computer at a Canadian pulp mill and, after hours, programs his CoCo 1 and 3.*



```
47 .....197 1580 .....159
205 .....186 2075 .....160
250 .....180 3030 .....94
314 .....98 4080 .....218
350 .....219 5015 .....9
376 .....126 6215 .....235
520 .....228 7150 .....228
680 .....24 7390 .....54
900 .....166 8510 .....74
1128 .....238 END .....242
1380 .....203
```

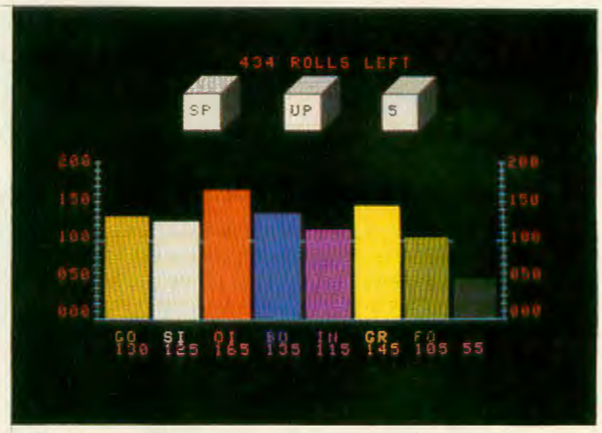
**Listing 1:** STOCKS3

```
Ø 'stockticker 88 (C)
1 'by mark webb
2 '
3 'COMPLETED MARCH 1988
4 '
5 'BOX 793
6 'GOLD RIVER B.C.
7 'CANADA
8 'VØP-1GØ
9 '
1Ø POKE65497,Ø
15 CLEAR5ØØ
2Ø CLSØ
3Ø DIM X,Y,JØ,Y1,P,N$(4),SV(8),O
V(8),M(4),S$(8),SL$(8),S(4,8),P1
(15),P2(15),T$(9),A$,B$,C$,D$,E$
(3),U,AB(4,8),Z
35 U=1
4Ø FORX=1 TO 8:SV(X)=1ØØ:OV(X)=Ø
:NEXTX
41 T$(6)="BR1BU1F1R4NE1L2U8R2NF1
L4G1BD7BR6"
42 T$(7)="BR1NR4U4NR3U4R4BD8BR2"
43 T$(8)="U8R2F1D2G1L2R1F2D2BR2"
44 T$(9)="BR1R2E1U2H4U2E1R2F1D2G
4D2F1BR6"
45 T$(1)="BR1NH1R3E1U2H1L3H1U2E1
R3F1BD7"
46 T$(2)="BR3E1NF1U7L2NG1R4F1BD7
"
47 T$(3)="BR2NR3U1H1U4E1U1R3D1F1
D4G1D1"
48 T$(4)="BR4R2NE1L2H1U6E1R2F1BD
7BR2"
49 T$(5)="U8D4R1F2ND2H2E2U2BD8BR
1"
5Ø FORX=1 TO 4:M(X)=1ØØØØ:NEXTX
52 E$(1)="UP":E$(2)="DN":E$(3)="
DV"
55 DATA Ø,7,Ø,Ø,Ø,Ø,Ø,Ø,Ø,11,33,
2Ø,47,55,52,Ø
56 FORX=Ø TO 15:READP2(X):NEXTX
57 POKE&HE6C6,18:POKE&HE6C7,18
6Ø DATA Ø,48,63,38,9,4Ø,54,17,7,
24,46,5,1,2,56,59
7Ø FORX=Ø TO 15:READP1(X):NEXTX
8Ø FORX=Ø TO 15:PALETTEX,P1(X):N
EXTX
9Ø DATA GO,SI,OI,BO,IN,GR,FO,SP
1ØØ FORX=1 TO 8:READ S$(X):NEXTX
1Ø1 DATA GOLD,SILVER,OIL,BONDS,I
NDUSTRIAL,GRAIN,FORESTRY,SPACE
1Ø2 FORX=1 TO8:READSL$(X):NEXTX
11Ø GOTO5ØØØ
2ØØ '8Ø column screen setup
2Ø1 HSCREENØ:WIDTH8Ø
2Ø2 CLS1
2Ø3 POKE&HEØ47,Ø
2Ø5 FORX=Ø TO 15:PALETTEX,P2(X):
NEXTX
2Ø6 ATTR5,Ø:LOCATE23,Ø:PRINT"* *
 * * STOCKTICKER 88 * * * *";:AT
TR1,Ø
2Ø7 FORX=Ø TO 3:LOCATE1+X*2Ø,2:P
RINT N$(X+1);:NEXTX
2Ø8 FORX=Ø TO 3
2Ø9 FORY=1 TO 8
21Ø LOCATE1+X*2Ø,2+Y:PRINT S$(Y)
;" - Ø";
211 NEXTY,X
212 FORX=Ø TO 7
213 ATTR3,Ø:LOCATE2+X*1Ø,12:PRIN
T S$(X+1);"=";SV(X+1);
214 NEXTX
215 ATTR2,Ø
216 FORY=Ø TO 3
217 FORX=Ø TO 3
218 LOCATE2+X*2Ø,14+Y
219 PRINT S$(Y+1);"  ";S$(Y+5);
22Ø NEXTX,Y
221 ATTR4,Ø
222 LOCATE3,19:PRINT"BUY";
223 LOCATE18,19:PRINT"SELL";
224 LOCATE34,19:PRINT"ROLL";
225 LOCATE5Ø,19:PRINT"AUTOROLL";
226 LOCATE68,19:PRINT"AUTOBUY";
227 ATTR1,Ø
228 RETURN
25Ø '8Ø column screen update
251 HSCREENØ:FORX=Ø TO 15:PALETT
EX,P2(X):NEXTX
252 ATTR1,Ø,U:FORX=Ø TO P-1:LOCA
TE1+X*2Ø,2:PRINTN$(X+1);:NEXTX
254 ATTR3,Ø,B:LOCATE1+(U-1)*2Ø,2
:PRINTN$(U);
256 ATTR4,Ø:FORX=1 TO P:LOCATE7+
(X-1)*2Ø,2:PRINTUSING"$$#######"
;M(X);:NEXTX
258 FORX=Ø TO 3
26Ø FORY=1 TO 8
262 LOCATE5+X*2Ø,Y+2:PRINTS(X+1,
Y);
264 NEXTY,X
266 LOCATE32,21:PRINTNR;"ROLLS L
EFT";
268 FORX=Ø TO 7
27Ø LOCATE5+X*1Ø,12:PRINTSV(X+1)
;
```

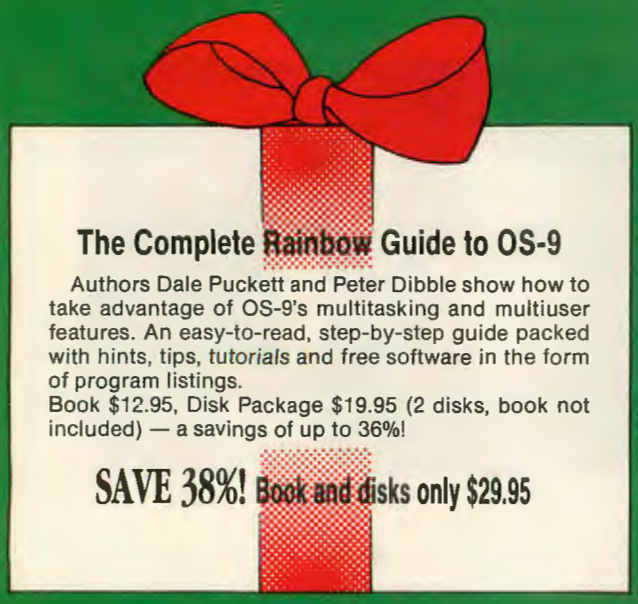
```
272 NEXTX
298 RETURN
3ØØ 'joystick input here
31Ø JØ=JOYSTK(Ø):JØ=INT(JØ/12)
311 FORX=1 TO 88:NEXTX:IFJØ=Ø TH
EN JØ=1
312 ATTR3,Ø:ONJØ GOSUB32Ø,322,32
4,326,328
313 FORX=Ø TO 88:NEXTX
314 ATTR4,Ø:ONJØ GOSUB32Ø,322,32
4,326,328
316 IF BUTTON(Ø)=1 THEN SOUND RN
D(255),1:GOTO33Ø ELSE31Ø
32Ø LOCATE3,19:PRINT"BUY";:RETUR
N
322 LOCATE18,19:PRINT"SELL";:RET
URN
324 LOCATE34,19:PRINT"ROLL";:RET
URN
326 LOCATE5Ø,19:PRINT"AUTOROLL";
:RETURN
328 LOCATE68,19:PRINT"AUTOBUY";:
RETURN
33Ø ON JØ GOTO335,37Ø,4ØØ,43Ø,45
Ø
334 'buy main
335 GOSUB34Ø:GOTO354
34Ø 'buy & sell subroutine
341 ATTR3,Ø:A$=STRING$(4Ø," ")
342 LOCATE32,21:PRINT"HOW MANY S
HARES?";:PLAY"T128V31L64O1CECECO
4EFGO5GGFG"
343 JØ=JOYSTK(Ø):NS=(JØ+1)*5ØØ
344 LOCATE49,21:PRINT"     ";
345 LOCATE49,21:PRINTNS;:FORX=1T
O111:NEXTX
346 IF BUTTON(Ø)=1 THEN348
347 GOTO343
348 PLAY"O3CGCGCGEFDGEFDGEGGGGEF
FFFFEDDDO1GDFEGCCC":LOCATE32,22:
PRINT"OF WHICH STOCK?";
349 JØ=JOYSTK(Ø):ST=INT((JØ+4)/8
):IFST<1 THEN ST=1
35Ø LOCATE49,22:PRINT"
";
351 LOCATE49,22:PRINT SL$(ST);
352 IF BUTTON(Ø)=1 THEN RETURN
353 GOTO349
354 IF NS*SV(ST)/1ØØ>M(U) THEN35
5 ELSE36Ø
355 LOCATE2Ø,21:PRINTA$:LOCATE2Ø
,22:PRINTA$;
356 LOCATE32,21:PRINT"NOT ENOUGH
 MONEY!";
357 SOUND18Ø,2:FORX=1 TO 667:NEX
TX
358 LOCATE32,21:PRINT"
      ";
359 GOTO362
36Ø LOCATE2Ø,21:PRINTA$;:LOCATE2
Ø,22:PRINTA$;:M(U)=M(U)-NS*SV(ST
)/1ØØ
361 S(U,ST)=S(U,ST)+NS
362 GOSUB25Ø:GOTO3ØØ
363 '*************************
37Ø 'sell main
372 GOSUB34Ø
374 IF NS>S(U,ST) THEN376 ELSE38
6
376 LOCATE2Ø,21:PRINTA$;:LOCATE2
Ø,22:PRINTA$;
378 LOCATE32,21:PRINT"NICE TRY E
H!";
38Ø FORX=1 TO22:PLAY"T255L128O3F
FGGFFGGF":NEXTX
382 LOCATE32,21:PRINT"
  ";
384 GOTO395
386 M(U)=M(U)+NS*SV(ST)/1ØØ
39Ø S(U,ST)=S(U,ST)-NS
392 LOCATE2Ø,21:PRINTA$;:LOCATE2
Ø,22:PRINTA$;
395 GOSUB25Ø:GOTO3ØØ
397 '*************************
4ØØ 'roll once
41Ø GOSUB8ØØØ:GOSUB3ØØØ
411 U=U+1:IFU>P THEN U=1
412 GOSUB25Ø
42Ø GOTO3ØØ
425 '************************
43Ø 'autoroll
431 AR=88
432 GOSUB8ØØØ:GOSUB3ØØØ
433 U=U+1:IFU>P THEN U=1
434 IF BUTTON(Ø)<>1 THEN432
436 AR=Ø:FORX=Ø TO 15:PALETTEX,Ø
:NEXTX:GOSUB25Ø:GOTO3ØØ
44Ø '************************
45Ø 'autobuy main
455 GOSUB85ØØ
46Ø GOTO 3ØØ
5ØØ 'how many players routine
52Ø HCOLOR1Ø,1Ø
53Ø HPRINT(11,5),"HOW MANY PLAYE
RS?"
54Ø FORX=Ø TO 3
55Ø HCOLOR8,8:HLINE(56+X*56,84)-
(56+(X*56)+32,64),PSET,BF
56Ø HCOLOR14,14:HLINE(57+X*56,83
)-(55+(X*56)+32,65),PSET
57Ø HLINE(6Ø+X*56,68)-(52+(X*56)
+32,8Ø),PSET,BF
575 HLINE(57+X*56,65)-(55+(X*56)
+32,83),PSET
58Ø HCOLORØ,Ø:HLINE(6Ø+X*56,68)-
(52+(X*56)+32,8Ø),PSET,B
59Ø NEXTX
61Ø HDRAW"BM68,77;S4;CØ;R6L3U6R3
L6"
62Ø HDRAW"BM124,77;R6L4U6L2R5NR2
D6R2"
63Ø HDRAW"BM179,77;NR8R2NU5R2NU5
```

```
R2U6R2L8"
64Ø HDRAW"BM235,77;NR12R2U6L2NR1
2R4D4F2R2E2U3"
65Ø JØ=JOYSTK(Ø):JØ=INT(JØ/16)
66Ø HCOLOR4,Ø
67Ø HLINE(55+JØ*56,85)-(89+JØ*56
,63),PSET,B
68Ø IF BUTTON(Ø)=1 THEN BP=77 EL
SEBP=Ø
69Ø HLINE(55+JØ*56,85)-(89+JØ*56
,63),PRESET,B
7ØØ IF BP=77 THEN 71Ø ELSE 65Ø
71Ø PLAY"T255L128O1FFGFFGDFFD"
72Ø P=JØ+1
73Ø RETURN
749 'BACKGROUND FOR # PLAYERS
75Ø HCOLOR8,Ø
755 HCLSØ
76Ø FORX=Ø TO 319 STEP6
77Ø HLINE(X,Ø)-(X,191),PSET
78Ø NEXTX
79Ø FORY=Ø TO 191 STEP 4
8ØØ HLINE(Ø,Y)-(319,Y),PSET
81Ø NEXTY
82Ø FORX=Ø TO 8
83Ø HLINE(X,X)-(319-X,191-X),PSE
T,B
84Ø NEXTX
85Ø HDRAW"BMØ,Ø;CØ;F8;BM319,Ø;G8
;BMØ,191;E8;BM319,191;H8;"
86Ø FORX=11 TO 3Ø9 STEP32
87Ø HSET(X,4,15):HSET(X,5,15):HS
ET(X+1,4,14):HSET(X+1,5,14)
872 HSET(X,187,14):HSET(X,188,14
):HSET(X+1,187,15):HSET(X+1,188,
15)
88Ø NEXTX
89Ø FORY=11 TO 18Ø STEP24
9ØØ HSET(4,Y,15):HSET(4,Y+1,15):
HSET(5,Y,14):HSET(5,Y+1,14)
91Ø HSET(315,Y,15):HSET(315,Y+1,
15):HSET(316,Y,14):HSET(316,Y+1,
14)
92Ø NEXTY
99Ø RETURN
999 'graph update subroutine
1ØØØ FORX=1 TO 8
1Ø1Ø IF SV(X)=OV(X) THEN112Ø
1Ø2Ø IF SV(X)>OV(X) THEN 1Ø3Ø EL
SE1Ø8Ø
1Ø3Ø FORY=OV(X) TO SV(X)
1Ø4Ø HCOLORX:Y1=INT(Y/2)
1Ø5Ø HLINE(2+X*32,168-Y1)-(3Ø+X*
32,168-Y1),PSET
1Ø6Ø NEXTY
1Ø7Ø GOTO112Ø
1Ø8Ø FORY=OV(X) TO SV(X) STEP-1
1Ø9Ø HCOLORØ,Ø:Y1=INT(Y/2)
11ØØ HLINE(2+X*32,168-Y1)-(3Ø+X*
32,168-Y1),PRESET
111Ø NEXTY
112Ø NEXTX
1125 FORY=1 TO 8:OV(Y)=SV(Y):NEX
TY
1126 HCOLOR3,Ø:HLINE(112,Ø)-(144
,8),PRESET,BF:HPRINT(14,Ø),NR-1
1127 HCOLOR9,Ø:HLINE(28,168)-(29
2,168),PSET
1128 HCOLOR1Ø,Ø:HLINE(4Ø,184)-(2
88,191),PRESET,BF
1129 FORX=1 TO 8:HPRINT(4*X,23),
SV(X):NEXTX
113Ø NR=NR-1
1131 IF NR=Ø THEN 6ØØØ
1132 IF AR=88 THEN114Ø
1135 FORX=Ø TO15:PALETTEX,Ø:NEXT
X
114Ø RETURN
1199 'graph set up subroutine
12ØØ HCLS
121Ø HCOLOR9,Ø
122Ø HLINE(28,68)-(28,168),PSET
123Ø HLINE-(292,168),PSET
124Ø HLINE-(292,68),PSET
125Ø HLINE(28,118)-(292,118),PSE
T
126Ø FORX=168 TO 68 STEP-5
127Ø HLINE(26,X)-(3Ø,X),PSET
128Ø HLINE(29Ø,X)-(294,X),PSET
129Ø NEXTX
13ØØ FORX=1 TO 8
131Ø HCOLORX,Ø
132Ø HPRINT(1+4*X,22),S$(X)
133Ø NEXTX
134Ø HCOLOR8,Ø
135Ø D$="NR24U24NE12R24E12NL24G1
2D24E12U24"
136Ø HDRAW"BM84,48;XD$;BM148,48;
XD$;BM212,48;XD$;"
137Ø FORX=Ø TO 2
138Ø HPAINT(86+X*64,46),2,8
139Ø HPAINT(11Ø+X*64,44),8,8
14ØØ HPAINT(88+X*64,22),14,8
141Ø NEXTX
1415 HCOLOR3,Ø:HPRINT(18,Ø)," RO
LLS LEFT"
1416 HCOLOR3,Ø:HPRINT(Ø,8),"2ØØ"
:HPRINT(Ø,11),"15Ø":HPRINT(Ø,14)
,"1ØØ":HPRINT(Ø,17),"Ø5Ø":HPRINT
(Ø,2Ø),"ØØØ"
1417 HPRINT(37,8),"2ØØ":HPRINT(3
7,11),"15Ø":HPRINT(37,14),"1ØØ":
HPRINT(37,17),"Ø5Ø":HPRINT(37,2Ø
),"ØØØ"
142Ø RETURN
15ØØ 'number of rounds routine
151Ø HCLS8
152Ø FORX=Ø TO 158 STEP 8
153Ø Y=X:IFY>191 THEN Y=191
154Ø HCOLOR4,Ø
155Ø HLINE(X,Y)-(319-X,191-Y),PR
ESET,B
```

```
1555 HLINE(X+4,Y+4)-(315-X,187-X
),PSET,B
156Ø NEXTX
157Ø HCOLOR6:HPRINT(12,9),"NUMBE
R OF ROUNDS?"
1575 HCOLOR1Ø,Ø
158Ø JØ=JOYSTK(Ø):JØ=JØ*25
1585 IF JØ>999 THEN JØ=999
159Ø HLINE(15Ø,96)-(174,1Ø2),PRE
SET,BF
16ØØ HPRINT(18,12),JØ
16Ø5 IF BUTTON(Ø)=1 THEN NR=JØ:G
OTO162Ø
161Ø GOTO 158Ø
162Ø NR=NR+1
163Ø RETURN
2ØØØ 'title page routine
2Ø2Ø HCLSØ
2Ø3Ø FORX=1TO333:HSET(RND(319),R
ND(191),8):HSET(RND(319),RND(191
),14):HSET(RND(319),RND(191),4):
NEXTX
2Ø5Ø A$=T$(1)+T$(2)+T$(3)+T$(4)+
T$(5)
2Ø6Ø B$=T$(2)+T$(6)+T$(4)+T$(5)+
T$(7)+T$(8)
2Ø62 HCOLOR8:HLINE(Ø,Ø)-(319,191
),PSET,B
2Ø63 FORX=1 TO 12
2Ø65 C$="BM"+STR$(2Ø+X)+","+STR$
(78-X)+";"
2Ø66 IF X=4 THEN HCOLOR4:HLINE(2
,2)-(317,189),PSET,B
2Ø67 IF X=8 THEN HCOLOR14:HLINE(
4,4)-(315,187),PSET,B
2Ø68 IF X=11 THEN HCOLOR3:HLINE(
6,6)-(313,185),PSET,B
2Ø7Ø HDRAW"XC$;S16;XA$;XB$;"
2Ø75 C$="BM"+STR$(13Ø+X)+","+STR
$(164-X)+";"
2Ø8Ø HDRAW"XC$;S24;XT$(9);XT$(9)
;"
2Ø85 NEXTX
2Ø86 HCOLOR1Ø:HPRINT(15,22),"BY
MARK WEBB"
2Ø95 PALETTE1Ø,RND(16)+31:FORX=1
TO2Ø:NEXTX
2Ø96 IF BUTTON(Ø)=1 THEN2Ø99
2Ø97 IF INKEY$<>""THEN2Ø99
2Ø98 GOTO2Ø95
2Ø99 PALETTE1Ø,44
21ØØ RETURN
3ØØØ 'roll dice,show em div
3ØØ1 'and update graph.
3ØØ3 FORX=Ø TO 15:PALETTEX,P1(X)
:NEXTX
3ØØ5 HSCREEN2
3ØØ7 X=RND(-TIMER)
3Ø1Ø D(1)=RND(8):D(2)=RND(3):D(3
)=RND(5)
3Ø15 IF RND(5)=5 THEN IF D(2)=2
```




```
THEN D(2)=INT(3/RND(3))
3Ø2Ø D(3)=D(3)*5
3Ø25 HCOLOR2:FORX=Ø TO 2:HLINE(8
8+X*64,31)-(1Ø4+X*64,41),PSET,BF
:NEXTX
3Ø3Ø HCOLORØ:HPRINT(11,4),S$(D(1
)):HPRINT(19,4),E$(D(2)):HPRINT(
26,4),D(3)
3Ø4Ø IF D(2)=1 THEN SV(D(1))=SV(
D(1))+D(3)
3Ø5Ø IF SV(D(1))>=2ØØ THEN SV(D(
1))=2ØØ:GOSUB1ØØØ:GOSUB4ØØØ:GOTO
314Ø
3Ø6Ø IF D(2)=2 THEN SV(D(1))=SV(
D(1))-D(3)
3Ø7Ø IF SV(D(1))<=Ø THEN SV(D(1)
)=Ø:GOSUB1ØØØ:GOSUB45ØØ:GOTO314Ø
3Ø75 GOSUB1ØØØ
3Ø8Ø IF D(2)=3 THEN3Ø9Ø ELSE314Ø
3Ø9Ø IF SV(D(1))<1ØØ THEN 314Ø
31ØØ FORX=1 TO P
311Ø Y=S(X,D(1))/1ØØ*D(3)
312Ø M(X)=M(X)+Y
313Ø NEXTX
3135 FORX=1 TO 5:PLAY"T255L2554
CDEFGABO5CEGB":NEXTX
314Ø RETURN
4ØØØ 'split routine
4Ø1Ø SV(D(1))=1ØØ
4Ø2Ø A$="*** "+SL$(D(1))+" HAS S
PLIT! ***"
4Ø3Ø X=INT((4Ø-LEN(A$))/2)
4Ø4Ø HCOLORD(1):HPRINT(X,7),A$
4Ø5Ø FORX=1 TO 1ØØ:PALETTED(1),R
ND(63):NEXTX
4Ø6Ø PALETTED(1),P1(D(1))
4Ø7Ø FORX=1 TO P:S(X,D(1))=S(X,D
(1))*2:NEXTX
4Ø8Ø GOSUB1ØØØ
4Ø9Ø HLINE(3Ø,55)-(279,64),PRESE
T,BF
41ØØ RETURN
45ØØ 'break routine
451Ø SV(D(1))=1ØØ
452Ø A$="### "+SL$(D(1))+" HAS B
USTED ###"
453Ø X=INT((4Ø-LEN(A$))/2)
```



### The Complete Rainbow Guide to OS-9

Authors Dale Puckett and Peter Dibble show how to take advantage of OS-9's multitasking and multiuser features. An easy-to-read, step-by-step guide packed with hints, tips, tutorials and free software in the form of program listings.
Book $12.95, Disk Package $19.95 (2 disks, book not included) — a savings of up to 36%!

**SAVE 38%! Book and disks only $29.95**

### The Rainbow Introductory Guide to Statistics

Dr. Michael Plog and Dr. Norman Stenzel give a solid introduction to the realm of statistical processes and thinking for both the beginner and the professional. (80-column printer required.)
Book $2.95, Tape or Disk $2.95 — a savings of 54%!

**SAVE 62%! Book and tape or disk only $4.95**

# Save up to 70%

## on our special discount

## A Holiday Gift Idea Welcome on Any

### The First Rainbow Book of Adventures

Contains 14 winning programs from our first Adventure contest. Includes *Sir Randolph of the Moors, Horror House, One Room, Dr. Avaloe* and more. Plus hints, tips on solving Adventures.
Book $2.00, Tape $2.00 — a 43% savings!

**SAVE 50%! Book and tape only $3.50**

### The Second Rainbow Book of Adventures

Featuring 24 of the most challenging Adventure games ever compiled. Meet the Beatles and battle the Blue Meanies, find a hidden fortune, or win the heart of a mysterious princess. *Ring Quest, Secret Agent Man, Dark Castle, Curse of Karos* and more!
Book $6.95, Tape $6.95 — a 50% savings!

**SAVE 57%! Book and tape only $11.95**

## The Rainbow Book of Simulations

20 award-winning entries from THE RAINBOW's first Simulations contest. You are a Civil War Commander, an air traffic controller, a civil defense coordinator, or a scientist on Mars . . . your wits are on the line.
Book $3.50, Tape $3.50 — a savings of 65%!

**SAVE 70%! Book and tape only $6**

## The Second Rainbow Book of Simulations

The 16 winners from our second Simulations contest. Fly through dense African jungle, bull your way down Wall Street, lead a bomb squad, or try your hand at Olympic events. Test your skills and talents.
Book $4.95, Tape or Disk $4.95 — a 50% savings!

**SAVE 55%! Book and tape only $8.95**
**SAVE 57%! Book and disk only $8.95**

*Brand New!*

## The Fourth Rainbow Book of Adventures

See Page 24 for order information

# packages!

# Rainbow Bookshelf!

## The Third Rainbow Book of Adventures

The excitement continues with 19 new Adventures. Discover backstage intrigue at the London Theatre, attempt a daring space rescue, or defeat evil in the year 2091 as a genetic android. *Evil Crypt, Spymaster, Time Machine, The Amulet*, and that's only the beginning!
Book $6.95, Tape $6.95, Two-Disk Set $7.95 — a savings of up to 47%!

**SAVE 45%! Book and tape only $11.95**
**SAVE 52%! Book and disk only $12.95**

Name _____
Address _____
City _____
State _____ ZIP _____
☐ Payment Enclosed, or ☐ Charge to:
☐ VISA ☐ MasterCard ☐ American Express
Account Number _____
Card Expiration Date _____
Signature _____

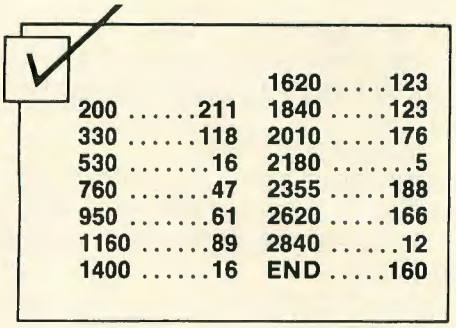
| | | | |
|---|---|---|---|
| ☐ **The Rainbow Book of Simulations** (first) | ~~$ 9.95~~ | $ 3.50 | _____ |
| ☐ Rainbow Simulations Tape(first) | ~~$ 9.95~~ | $ 3.50 | _____ |
| ☐ First Simulations Package | ~~$19.90~~ | $ 6.00 | _____ |
| ☐ **The Second Rainbow Book of Simulations** | ~~$ 9.95~~ | $ 4.95 | _____ |
| ☐ Second Rainbow Simulations Tape | ~~$ 9.95~~ | $ 4.95 | _____ |
| ☐ Second Rainbow Simulations Disk | ~~$10.95~~ | $ 4.95 | _____ |
| ☐ Second Simulations Package with Tape | ~~$19.90~~ | $ 8.95 | _____ |
| ☐ Second Simulations Package with Disk | ~~$20.90~~ | $ 8.95 | _____ |
| ☐ **The Complete Rainbow Guide to OS-9** | ~~$19.95~~ | $12.95 | _____ |
| ☐ Rainbow Guide to OS-9 Disk Set (2 disks) | ~~$31.00~~ | $19.95 | _____ |
| ☐ Rainbow Guide to OS-9 Package | ~~$47.95~~ | $29.95 | _____ |
| ☐ **The Windows & Applications Disk for** The Complete Rainbow Guide to OS-9 Level II, Vol. I | | $19.95 | _____ |
| ☐ **The Rainbow Book of Adventures** (first) | ~~$ 7.95~~ | $ 2.00 | _____ |
| ☐ Rainbow Adventures Tape (first) | ~~$ 7.95~~ | $ 2.00 | _____ |
| ☐ First Adventure Package | ~~$15.90~~ | $ 3.50 | _____ |
| ☐ **The Second Rainbow Book of Adventures** | ~~$13.95~~ | $ 6.95 | _____ |
| ☐ Second Rainbow Adventures Tape | ~~$13.95~~ | $ 6.95 | _____ |
| ☐ Second Adventure Package | ~~$27.90~~ | $11.95 | _____ |
| ☐ **The Third Rainbow Book of Adventures** | ~~$11.95~~ | $ 6.95 | _____ |
| ☐ Third Adventures Tape | ~~$ 9.95~~ | $ 6.95 | _____ |
| ☐ Third Adventures Disk Set (2 disks) | ~~$14.95~~ | $ 7.95 | _____ |
| ☐ Third Adventure Package with Tape | ~~$21.90~~ | $11.95 | _____ |
| ☐ Third Adventure Package with Disk | ~~$26.90~~ | $12.95 | _____ |
| ☐ **Introductory Guide to Statistics** | ~~$ 8.95~~ | $ 2.95 | _____ |
| ☐ Guide to Statistics Tape or Disk (indicate choice) | ~~$ 5.95~~ | $ 2.95 | _____ |
| ☐ Guide to Statistics Package (indicate choice of tape or disk) | ~~$12.90~~ | $ 4.95 | _____ |
| Add $1.50 per book Shipping and Handling in U.S. | | | _____ |
| Outside U.S., add $4 per book | | | _____ |
| Kentucky residents add 5% sales tax | | | _____ |
| (Allow 6 to 8 weeks for delivery) | | Total | _____ |

**Mail to: Rainbow Bookshelf, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. To order by phone (*credit card orders only*) call (800) 847-0309, 8 a.m. to 5 p.m. EST. For other inquiries call (502) 228-4492.**

Please note: The tapes and disks offered by The Rainbow Bookshelf are not stand-alone products. That is, they are intended to be an adjunct and complement to the books. Even if you buy the tape or disk, you will still need the appropriate book for loading and operating instructions. OS-9® is a registered trademark of the Microware Systems Corporation.

```
454Ø HCOLORD(1):HPRINT(X,7),A$
455Ø FORX=1 TO P:S(X,D(1))=Ø:NEX
TX
456Ø FORX=1 TO 1ØØØ:NEXTX
457Ø HLINE(3Ø,55)-(279,64),PRESE
T,BF
458Ø A$="ALL "+SL$(D(1))+" HAS B
EEN CONFISCATED"
459Ø X=INT((4Ø-LEN(A$))/2)
46ØØ HPRINT(X,7),A$
461Ø SOUND3Ø,2:GOSUB1ØØØ
462Ø FORX=24 TO 159
463Ø HLINE(X,55)-(X,64),PRESET:H
LINE(319-X,55)-(319-X,64),PRESET
464Ø NEXTX
465Ø RETURN
5ØØØ 'main startup section
5Ø1Ø 'game start gosubs
5Ø15 HSCREEN2
5Ø2Ø GOSUB2ØØØ
5Ø3Ø GOSUB75Ø:GOSUB5ØØ
5Ø4Ø GOSUB15ØØ
5Ø5Ø GOSUB7ØØØ
5Ø6Ø GOSUB12ØØ:GOSUB1ØØØ
5Ø7Ø GOSUB2ØØ
5Ø8Ø GOSUB25Ø
5Ø9Ø GOTO 3ØØ
51ØØ END
6ØØØ 'end routine
6Ø1Ø HSCREENØ
6Ø2Ø WIDTH32
6Ø3Ø RGB
6Ø4Ø CLSØ
6Ø5Ø FORX=1 TO 3Ø
6Ø6Ø PRINT@X,CHR$(128+RND(126));
6Ø61 PRINT@X+48Ø,CHR$(128+RND(12
6));
6Ø62 NEXTX
6Ø65 FORY=1 TO 14:PRINT@Y*32,CHR
$(128+RND(126));:PRINT@Y*32+31,C
HR$(128+RND(126));:NEXTY
6Ø7Ø POKE&HFFBC,45:POKE&HFFBD,Ø
6Ø8Ø PRINT@33," * * * * STOCKTIC
KER 88 * * *";
6Ø9Ø PRINT@1Ø6,"FINAL TOTALS";
6Ø92 PRINT@138,"============"
61ØØ FORX=1 TO P
611Ø FORY=1 TO 8
612Ø M(X)=M(X)+SV(Y)*S(X,Y)/1ØØ
613Ø NEXTY,X
62ØØ FORX=1 TO P
621Ø PRINT@135+X*64,N$(X);
6215 PRINT@145+X*64,M(X);
622Ø NEXTX
623Ø PRINT@427,"GAME OVER";
624Ø POKE&HFFBC,5Ø:POKE&HFFBD,Ø
65ØØ I$=INKEY$:IFI$=""THEN65ØØ
651Ø GOTO 9999
7ØØØ 'name input routine
7Ø1Ø FORX=2ØØ TO 1Ø STEP-1Ø
7Ø2Ø SOUNDX,1
7Ø3Ø NEXTX
7Ø35 HCLS12
7Ø5Ø HCOLORØ:HLINE(Ø,1ØØ)-(319,1
Ø6),PSET
7Ø6Ø Y=8Ø
7Ø7Ø FORX=Ø TO 319
7Ø8Ø Z=RND(3)-2:Y=Y+Z
7Ø9Ø IF Y>98 THEN Y=98
71ØØ IF Y<5Ø THEN Y=5Ø
711Ø HSET(X,Y,Ø)
712Ø NEXTX
713Ø HPAINT(2,4Ø),11,Ø
714Ø HPAINT(Ø,191),13,Ø
716Ø HCOLOR14,Ø
717Ø HLINE(87,56)-(216,12Ø),PSET
,BF
7175 HCOLOR15
718Ø HLINE(91,6Ø)-(212,116),PSET
,BF
719Ø HCOLOR14
72ØØ HLINE(87,56)-(71,4Ø),PSET
721Ø HLINE-(2ØØ,4Ø),PSET:HLINE-(
216,56),PSET
722Ø HLINE(71,4Ø)-(71,1Ø4),PSET:
HLINE-(87,12Ø),PSET
723Ø HPAINT(73,1ØØ),8,14:HPAINT(
87,48),14,14
724Ø HLINE(112,12Ø)-(128,184),PS
ET,BF
725Ø HLINE(176,12Ø)-(192,184),PS
ET,BF
726Ø HLINE(176,184)-(16Ø,168),PS
ET
727Ø HLINE-(16Ø,12Ø),PSET
728Ø HLINE(112,184)-(96,168),PSE
T
729Ø HLINE-(96,12Ø),PSET
73ØØ HPAINT(1Ø4,16Ø),8,14
731Ø HPAINT(168,168),8,14
7315 HCOLOR8:HLINE(87,12Ø)-(216,
12Ø),PSET
7316 HLINE(87,56)-(216,56),PSET
732Ø HCOLORØ,Ø
733Ø HPRINT(12,8),"PLAYERS NAMES
?"
734Ø FORX =1 TO P
735Ø Y=Ø
736Ø HPRINT(12,9+X),"#"+RIGHT$(S
TR$(X),1)
737Ø I$=INKEY$:IFI$=""THEN737Ø
738Ø IFI$=CHR$(13) THEN743Ø
739Ø IF I$=CHR$(8) THEN HCOLOR15
:SOUND5Ø,1:HLINE(1Ø4,72+X*8)-(2Ø
Ø,8Ø+X*8),PSET,BF:N$(X)="":HCOLO
RØ:GOTO735Ø
74ØØ N$(X)=N$(X)+I$:IFLEN(N$(X))
=8 THEN743Ø
741Ø HPRINT(16+Y,9+X),I$:Y=Y+1
742Ø GOTO737Ø
743Ø NEXTX
744Ø RETURN
```

```
8ØØØ 'autobuy subroutine
8ØØ5 FL=Ø
8Ø1Ø FORX=1 TO 8
8Ø2Ø IF AB(U,X)=99 THEN FL=11:C=
Ø
8Ø3Ø NEXTX
8Ø4Ø IF FL<>11 THEN 8Ø9Ø
8Ø5Ø X=RND(8):C=C+1
8Ø55 IF C>=3Ø THEN 8Ø9Ø
8Ø56 IF AB(U,X)<>99 THEN8Ø5Ø
8Ø6Ø IF M(U)>=SV(X)*5 THEN S(U,X
)=S(U,X)+5ØØ:M(U)=M(U)-SV(X)*5
8Ø7Ø IF M(U)>=1ØØØ THEN8Ø5Ø
8Ø9Ø FL=Ø:RETURN
85ØØ 'autobuy on/off routine
851Ø JØ=JOYSTK(Ø):JØ=INT((JØ+1)/
8)
8515 IF JØ=Ø THEN JØ=1
852Ø Y=13
853Ø X=2+((U-1)*2Ø)
854Ø IF JØ>4 THEN X=X+4
855Ø IF JØ>4 THEN Y=Y+JØ-4 ELSE
Y=Y+JØ
856Ø LOCATEX,Y
857Ø ATTR6,Ø:PRINTS$(JØ);
858Ø FORZ=1 TO 222:NEXTZ
8585 LOCATEX,Y
859Ø ATTR2,Ø:PRINTS$(JØ);
86ØØ FORZ=1 TO 222:NEXTZ
861Ø IF BUTTON(Ø)=1 THEN IF AB(U
,JØ)=99 THEN AB(U,JØ)=Ø:GOTO863Ø
 ELSE AB(U,JØ)=99:GOTO863Ø
862Ø GOTO851Ø
863Ø PLAY"T255O3DDGGDDO1CCCO3DEF
D"
8632 FORZ=1 TO 8
8633 Y=13:X=2+((U-1)*2Ø)
8634 IF Z>4 THEN X=X+4
8635 IF Z>4 THEN Y=Y+Z-4 ELSE Y=
Y+Z
864Ø IF AB(U,Z)=99 THEN ATTR6,Ø:
LOCATEX,Y:PRINTS$(Z); ELSE ATTR2
,Ø:LOCATEX,Y:PRINTS$(Z);
8645 NEXTZ
865Ø RETURN
9999 HSCREENØ:WIDTH32:RGB:POKE&H
FFBC,45:POKE&HFFBD,Ø:POKE65496,Ø
:END
```



| | | | |
|---|---|---|---|
| | | 1620 | 123 |
| 200 | 211 | 1840 | 123 |
| 330 | 118 | 2010 | 176 |
| 530 | 16 | 2180 | 5 |
| 760 | 47 | 2355 | 188 |
| 950 | 61 | 2620 | 166 |
| 1160 | 89 | 2840 | 12 |
| 1400 | 16 | END | 160 |

**Listing 2:** STOCKS2

```
1Ø CLSØ
2Ø CLEAR25ØØ
3Ø DIM BA$(14),G(6,4),G$(8),T(14
),L(6),L$(6),Z(6)
4Ø '
5Ø '***STOCK TICKER*86**********
6Ø '***BY MARK WEBB ************
7Ø '***FOR COCO 1&2*************
8Ø '***REVISED AUG. 88**********
9Ø '***BOX 793 GOLD RIVER B.C.**
1ØØ '**CANADA***VOP 1GØ*********
11Ø '
12Ø POKE142,Ø
13Ø X=RND(-TIMER)
14Ø PL$(1)="V31O5T1ØØL1GABBGABBG
ABBGABBGABBGABBGABBGABBGABB"
15Ø PL$(2)="V31T64O1L4CCFFCCFFCC
FFCCFFBCCFFCCFFCCFFCCFFCCFFCCFFC
CFFCCFFCCFF"
16Ø PL$(3)="V31T32O4BAGFEDCO3BAG
FEDCO2BAGFEDCO1BAGFEDC"
17Ø PL$(4)="V31T32O2CDEFGABO3CDE
FGABO4CDEFGABO5CDEFGAB"
18Ø PL$(5)="V31L16T255O4CEGBDFAC
EGBDFACEGBDFACEGBDFA"
19Ø PL$(6)="V31T28O4L4V15CV13CV1
1CV9CV7CV5CV3CV1CV3CV5CV7CV9CV11
CV13CV15C"
2ØØ G$(1)=STRING$(31,249):G$(2)=
STRING$(31,246)
21Ø G$(3)=STRING$(32,143):G$(4)=
STRING$(31,143)
22Ø U=1:AD=Ø
23Ø FORX=1TO6:READ D1$:S$(X)=D1$
:NEXTX
24Ø DATA GOLD,SILVER,OIL,BONDS,I
NDUST,GRAIN
25Ø FORX=1TO6:L(X)=1ØØ:NEXTX
26Ø FORX=1TO4
27Ø FORX1=1TO32
28Ø READD1:G$(4+X)=G$(4+X)+CHR$(
D1)
29Ø NEXTX1,X
3ØØ DATA 128,128,167,175,175,175
,175,17Ø,128,128,128,128,128,167
,175,175,175,175,17Ø,128,128,128
,128,128,167,175,175,175,175,17Ø
,128,128
31Ø DATA 128,167,175,175,175,175
,175,17Ø,128,128,128,128,167,175
,175,175,175,175,17Ø,128,128,128
```

```
,128,167,175,175,175,175,175,17Ø
,128,128
32Ø DATA 128,143,143,143,143,143
,175,17Ø,128,128,128,128,143,143
,143,143,143,175,17Ø,128,128,128
,128,143,143,143,143,143,175,17Ø
,128,128
33Ø DATA 128,143,143,143,143,143
,174,128,128,128,128,128,143,143
,143,143,143,174,128,128,128,128
,128,143,143,143,143,143,174,128
,128,128
34Ø 'title page layout
35Ø CLS3
36Ø SOUNDRND(255),1
37Ø FORX=1TO14:PRINT@32*X,CHR$(2
49);:PRINT@32*X+31,CHR$(249);:NE
XTX
38Ø PRINT@Ø,STRING$(32,249);:PRI
NT@48Ø,STRING$(31,249);
39Ø POKE1Ø55,249
4ØØ POKE 1535,249
41Ø PRINT@7Ø,"***STOCK TICKER*86
**";
42Ø PRINT@138,"BY M.WEBB";
43Ø PRINT@297-32,"JAN/Ø6,1984";
44Ø PRINT@265-32," COPYRIGHT ";
45Ø PRINT@326,"COCO 1-2 VERSION"
;
46Ø PRINT@387,"UPDATED MARCH 86
& AUG 88";
47Ø IF INKEY$=""THEN47ØELSE48Ø
48Ø '# of players set up
49Ø CLS3:PLAY"V31"
5ØØ SOUNDRND(88),3
51Ø PRINT@7Ø,"HOW MANY PLAYERS(1
-4)";:INPUTP
52Ø IF P=4 THEN 56Ø
53Ø PRINT@162,"DO YOU WISH HAL T
O PLAY ALSO";
54Ø I$=INKEY$:IFI$="" THEN 54Ø
55Ø IF I$="Y" OR I$="N" THEN 56Ø
 ELSE54Ø
56Ø PRINT@162,STRING$(3Ø,175);
57Ø IF I$="N" THEN JJ=7Ø:HF=88
58Ø FORX=1TO5:SOUNDRND(255),1:NE
XTX
59Ø IFP>4 THEN 48Ø
6ØØ FORX=1TOP
61Ø PRINT@134+(X-1)*64,"PLAYER #
";X;"NAME";:INPUTN$(X)
62Ø NEXTX
63Ø IF P=4 THEN 65Ø
64Ø IF I$="Y" THEN P=P+1:N$(P)="
HAL"
65Ø FORX=1TOP:M(X)=1ØØØØ:NEXTX
66Ø PLAYPL$(5)
67Ø CLS7
68Ø FORX=5 TO 26
69Ø PRINT@32+X,CHR$(159);
7ØØ PRINT@448+X,CHR$(159);
71Ø NEXTX
72Ø FORX=3 TO 12
73Ø PRINT@32*X+3,CHR$(159);:PRIN
T@X*32+28,CHR$(159);
74Ø NEXTX
75Ø PRINT@1Ø3,"HOW MANY ROUNDS";
76Ø PRINT@199,"(2ØØ-4ØØ) IS AVG.
";
77Ø PRINT@3Ø1,"?   ";
78Ø R$="":R=Ø
79Ø I$=INKEY$:IFI$=""THEN79Ø
8ØØ IFI$=CHR$(8) THEN PRINT@3Ø2,
STRING$(4,143);:GOTO78Ø
81Ø IFI$=CHR$(13) THEN83Ø
82Ø R$=R$+I$:PRINT@3Ø2,R$;:GOTO7
9Ø
83Ø PRINT@395,"OK? (Y/N)";:SOUND
22,1
84Ø I$=INKEY$:IFI$=""THEN84Ø
85Ø IFI$<>"Y" THEN I$=CHR$(8):GO
TO8ØØ
86Ø R=VAL(R$):IFR<=Ø THEN 67Ø
87Ø PLAY PL$(6)
88Ø '
89Ø CLS
9ØØ TP$=STRING$(6,128)+"stock"+C
HR$(128)+"ticker"+STRING$(14,128
)
91Ø PRINT TP$
92Ø POKE1Ø43,56:POKE1Ø44,54
93Ø PRINT@33,N$(1);:PRINT@49,N$(
2);:PRINT@257,N$(3);:PRINT@273,N
$(4);
94Ø PRINT@39,"$";:PRINT@55,"$";:
PRINT@263,"$";:PRINT@279,"$";
95Ø IF M(1)<1 THEN M(1)=Ø
96Ø IF M(2)<1 THEN M(2)=Ø
97Ø IF M(3)<1 THEN M(3)=Ø
98Ø IF M(4)<1 THEN M(4)=Ø
99Ø FORX=1 TO P
1ØØØ M(X)=INT(1ØØ*M(X))/1ØØ
1Ø1Ø NEXTX
1Ø2Ø PRINT@4Ø,M(1);:PRINT@56,M(2
);:PRINT@264,M(3);:PRINT@28Ø,M(4
);
1Ø3Ø FORX=1TO6
1Ø4Ø PRINT@32*X+33,LEFT$(S$(X),2
);:PRINT@32*X+49,LEFT$(S$(X),2);
1Ø5Ø NEXTX
1Ø6Ø FORX=8TO13
1Ø7Ø PRINT@32*X+33,LEFT$(S$(X-7)
,2);:PRINT@32*X+49,LEFT$(S$(X-7)
,2);
1Ø8Ø NEXT X
1Ø9Ø FORX=32TO192STEP32
```

```
11ØØ PRINT@4+X+32,G(X/32,1);:PRI
NT@2Ø+X+32,G(X/32,2);:PRINT@228+
X+32,G(X/32,3);:PRINT@244+X+32,G
(X/32,4);
111Ø NEXT X
112Ø FORX=Ø TO 5
113Ø PRINT@48Ø+X*5,L(X+1);
114Ø NEXT X
115Ø 'draw a square beside playe
r
116Ø IFU=1THENPRINT@32,CHR$(159)
;
117Ø IFU=2THENPRINT@48,CHR$(159)
;
118Ø IFU=3THENPRINT@256,CHR$(159
);
119Ø IFU=4THENPRINT@272,CHR$(159
);
12ØØ 'main loop
121Ø BS$=INKEY$
122Ø IF BS$="Q" THEN FL=Ø
123Ø IF BS$="A" THEN FL=1
124Ø IF FL=1 THEN 135Ø
125Ø IF BS$="H" THEN GOTO264Ø
126Ø IF BS$="^" THEN U=U+1:IF U>
P THEN U=1
127Ø IFBS$="^"THEN 88Ø
128Ø IFBS$="B"THEN191Ø
129Ø IF JJ=7Ø THEN 131Ø
13ØØ IF U=P THEN IF BS$="C" THEN
 JJ=7Ø:GOTO286Ø
131Ø IFBS$="S"THEN191Ø
132Ø IFBS$=CHR$(32)THEN135Ø
133Ø BS$=""
134Ø GOTO121Ø
135Ø 'dice roll and adjustments
136Ø IF HF=88 THEN 138Ø
137Ø IF RND(3)=2 THEN IF U=P THE
N GOSUB279Ø
138Ø RC=RC+1:IFRC>=R THEN 24ØØ
139Ø U=U+1:IF U>P THEN U=1
14ØØ 'roll three dice
141Ø PLAYPL$(2)
142Ø D(1)=RND(6):D(2)=RND(3):D(3
)=RND(3)
143Ø IF D(2)=2 THEN IF RND(1Ø)>7
 THEN D(2)=RND(2)*2+-1
144Ø IFD(3)=1THEN D(3)=5
145Ø IFD(3)=2THEN D(3)=1Ø
146Ø IFD(3)=3THEN D(3)=2Ø
147Ø 'ADJUST UP & DOWN
148Ø GOSUB162Ø
149Ø IF D(2)=1 THEN L(D(1))=L(D(
1))+D(3):PLAYPL$(4)
15ØØ IF L(D(1))>=2ØØ THEN GOSUB1
73Ø
151Ø IF D(2)=2 THEN L(D(1))=L(D(
1))-D(3):PLAYPL$(3)
152Ø IF L(D(1))<=Ø THEN GOSUB182
Ø
153Ø 'dividend routine
154Ø IF D(2)=3 THEN 155Ø ELSE 16
1Ø
155Ø IFL(D(1))<1ØØTHEN FORX=1TO5
ØØ:NEXTX:GOTO 161Ø
156Ø PLAY PL$(1)
157Ø FORX=1TOP
158Ø DV=G(D(1),X)/1ØØ*D(3)
159Ø M(X)=M(X)+DV
16ØØ NEXT X
161Ø GOTO 88Ø
162Ø CLSØ
163Ø PRINT@71,"# ROLLS LEFT "+ST
R$(R-RC);
164Ø PRINT@16Ø,G$(5);:PRINT@192,
G$(6);
165Ø PRINT@224,G$(7);:PRINT@256,
G$(7);
166Ø PRINT@288,G$(8);
167Ø PRINT@257,LEFT$(S$(D(1)),5)
;
168Ø IF D(2)=1 THENPRINT@269,"UP
";
169Ø IF D(2)=2 THENPRINT@268,"DO
```


**DATAMATCH, INC.**

(THE SOFTWARE HOUSE HAS A NEW NAME)

**DS/DD DISKS** **$45/100 10/$4.95**

**FLIPPY DISKS 10/$7.95**

**FACTORY PUNCHED-USE BOTH SIDES. $75/100**

**CERTIFIED ERROR FREE. W/SLEEVES, LABELS, W.P.**

PRINTER RIBBONS

| | | |
|---|---|---|
| APPLE IMAGE WRITER | $ 4.95 | 6/$27.00 |
| APPLE IM.WR.II 4 COLOR | $12.95 | |
| APPLE LQ - M/S | $ 4.95 | |
| COMMODORE MPS 801 | $ 4.95 | R.S. DMP110 |
| COMMODORE MPS 803 | $ 4.95 | |
| COMMODORE 1526 | $ 7.50 | BLUE STREAK |
| DIABLO HYTYPE II - M/S | $ 4.95 | |
| EPSON MX80/86E | $ 4.95 | 6/$27.00 |
| EPSON SPECTRUM LX80/90 | $ 4.50 | |
| GEMINI 10/S/SG, BLACK | $ 2.00 | DOZ./$22.00 |
| GEM COLORS R-B-G-BR-PUR | $ 3.00 | 5/$12.00 |
| NEC P2/P6 FILM | $ 6.95 | |
| NEC P3/P7 FILM | $ 8.95 | |
| OKIDATA 80/82/90/92 - SEE GEMINI 10 | | |
| OKI.MICROLINE 182/192 | $ 7.50 | |
| R.S. DMP130, BLACK | $ 6.95 | |
| COLORS RED-BLU-GREEN | $ 7.95 | 3/$22.00 |
| STAR NL/NX/10, BLACK | $ 7.95 | |
| STAR RADIX 10, BLACK | $ 7.50 | |

OTHER RIBBONS AVAILABLE. CALL OR WRITE.

**ALL ITEMS 100% GUARANTEED**

*Add $2.50 S/H in U.S.A. - Canada Add $3.50 + $1.00/LB*
*Michigan Residents Add 4% Sales Tax*
*Send Check/Money Order Payable to:*

**DATAMATCH, INC.**

VISA 9020 Hemingway, Redford, MI 48239 MasterCard

**(313) 937-1313**

Send Card Number & Exp. Date Min. Charge Order $20.00

```
WN";
17ØØ IF D(2)=3 THENPRINT@269,"DI
V";
171Ø PRINT@279,D(3);
172Ø RETURN
173Ø 'splitting routine
174Ø PRINT@396,"IT SPLIT!!";
175Ø FORX=1TO3:PLAYPL$(1):NEXTX
176Ø PRINT@396,"IT SPLIT!!";
177Ø L(D(1))=1ØØ
178Ø FORX=1TOP
179Ø G(D(1),X)=G(D(1),X)*2
18ØØ NEXTX
181Ø RETURN
182Ø 'breaking routine
183Ø L(D(1))=1ØØ
184Ø PRINT@396,"IT BROKE . . .";
185Ø PRINT@384+32,"IT FELL THROU
GH THE FLOOR EH!";
186Ø FOR X=1TOP
187Ø G(D(1),X)=Ø
188Ø NEXTX
189Ø FORX=1TO 8:SOUND122,1:SOUND
2Ø,1:NEXTX
19ØØ RETURN
191Ø 'buy & sell routine
192Ø 'display stocks first
193Ø SOUND2ØØ,1
194Ø CLSØ
195Ø PRINT@8,STRING$(17,236);:PR
INT@232,STRING$(17,227);
196Ø FORX=ØTO7:PRINT@X*32+7,CHR$
(229);:PRINT@X*32+25,CHR$(234);:
NEXTX
197Ø PRINT@266,CHR$(239);:PRINT@
277,CHR$(239);:PRINT@297,CHR$(22
7);:PRINT@298,CHR$(236);:PRINT@2
99,CHR$(227);:PRINT@3Ø8,CHR$(227
);:PRINT@3Ø9,CHR$(236);:PRINT@31
Ø,CHR$(227);
198Ø PRINT@32Ø,STRING$(32,239);
199Ø FOR X= 352TO448 STEP32:PRIN
T@X,G$(3);:NEXTX:PRINT@48Ø,G$(4)
;:POKE1535,143
2ØØØ PRINT@4Ø,"GOLD   IS AT";L(1
);
2Ø1Ø PRINT@72,"SILVER IS AT";L(2
);
2Ø2Ø PRINT@1Ø4,"OIL    IS AT";L(
3);
2Ø3Ø PRINT@136,"BONDS ARE AT";L(
4);
2Ø4Ø PRINT@168,"INDUST IS AT";L(
5);
2Ø5Ø PRINT@2ØØ,"GRAIN  IS AT";L(
6);
2Ø6Ø PRINT@3Ø1,LEFT$(N$(U),6);
2Ø7Ø PRINT@354,USING"$$#########
";M(U);
2Ø8Ø IFBS$="B"THENPRINT@333,"BUY
ING";
2Ø9Ø IFBS$="S"THENPRINT@333,"SEL
LING";
21ØØ PRINT@484,"PRESS *ENTER* TO
 RETURN";
211Ø PRINT@39Ø,"HOW MANY SHARES"
;:INPUTS:SOUNDRND(233),2
212Ø IFS=ØTHEN88Ø
213Ø IFS<5ØØ THEN 211Ø
214Ø PRINT@423,"OF WHICH STOCK "
;:INPUTU$:SOUND233,2
215Ø FORX=1TO6:IFLEFT$(U$,2)=LEF
T$(S$(X),2)THEN216ØELSE NEXTX:I$
="N":GOTO22ØØ
216Ø V=S/1ØØ*L(X)
217Ø PRINT@454,"VALUE IS";V;"OK(
Y/N)";:PLAY"T255O5CGDGECCGDGECC"
218Ø PRINT@485,"PRESS **Q** TO R
ETURN    ";
219Ø I$=INKEY$:IF I$=""THEN219Ø
22ØØ IF I$="N"  THEN PRINT@462,S
TRING$(8,143);:PRINT@4Ø5,STRING$
(8,143);:PRINT@438,STRING$(8,143
);:GOTO211Ø
221Ø IF I$="Q"THEN88Ø
222Ø IF BS$="B" THEN GOSUB225Ø:G
OTO 224Ø
223Ø IF BS$="S" THEN GOSUB234Ø
224Ø GOTO88Ø
225Ø 'value calculator to buy
226Ø IF V<=M(U) THEN 231Ø
227Ø PRINT@39Ø,"SORRY BUT YOU DO
NT    ";
228Ø PRINT@423,"HAVE ENOUGH MONE
Y     ";
229Ø PRINT@454,STRING$(21,143);
23ØØ SOUND3Ø,2Ø:RETURN
231Ø G(X,U)=G(X,U)+S
232Ø M(U)=M(U)-V
233Ø RETURN
234Ø 'value calculator to sell
235Ø IFG(X,U)>=S THEN236Ø ELSE P
RINT@39Ø,STRING$(24,143);:PRINT@
423,STRING$(24,143);:PRINT@454,S
TRING$(24,143);:PRINT@423,"NICE
TRY BUDDY";
2355 FORXW=1 TO 333:NEXTXW:GOTO8
8Ø
236Ø G(X,U)=G(X,U)-S
237Ø M(U)=M(U)+V
238Ø RETURN
239Ø 'end routine here eh
24ØØ CLS6:PRINT@167,"TIMES UP FO
LKS!!";
241Ø PRINT@227,"ALL STOCKS WILL
NOW BE SOLD!";
242Ø SOUND22Ø,2Ø
243Ø SOUND2ØØ,2Ø
244Ø SOUND22Ø,2Ø
245Ø SOUND2ØØ,2Ø
246Ø FORX=1TOP
247Ø FORY=1TO6
```

```
248Ø V=G(Y,X)/1ØØ*L(Y)
249Ø M(X)=M(X)+V
25ØØ NEXTY
251Ø NEXTX
252Ø FORX=1TO6:PLAYPL$(X):NEXTX
253Ø CLS8
254Ø FORX=3TO P*3 STEP 3
255Ø PRINT@X*32,N$(X/3);:PRINT@X
*32+7,USING"$$##########";M(X/3);
256Ø NEXTX
257Ø PN=1:HS=M(1)
258Ø FORX=2 TO P
259Ø IF M(X)>HS THEN HS=M(X):PN=
X
26ØØ NEXTX
261Ø FORX=1 TO 1333:NEXTX
262Ø PRINT@49Ø,N$(PN)+" WINS EH!
";
263Ø GOTO263Ø
264Ø 'help menu here
265Ø CLS
266Ø PRINT@1Ø,"STOCK TICKER";
267Ø PRINT@42,"------------";
268Ø PRINT@1Ø2,"H = HELP";
269Ø PRINT@134,"C = ORIGINAL BUY
 FOR HAL"
27ØØ PRINT@166,"A = AUTO ROLL";
271Ø PRINT@23Ø,"Q = QUIT AUTO RO
LL";
272Ø PRINT@262,"B = BUY STOCKS";
273Ø PRINT@198,"S = SELL STOCKS"
;
274Ø PRINT@483," PRESS ANY KEY T
O RETURN";
275Ø EXEC44539
276Ø GOTO 88Ø
278Ø 'hal routine
279Ø IF M(U)<1ØØØ THEN 2855
28ØØ CLSRND(8):PRINT@166,"I'M GO
NNA BUY";
281Ø Y=Ø
282Ø X=RND(6)
283Ø Y=Y+1:IFY=12 THEN2855
284Ø IF M(U)>=5ØØ/1ØØ*L(X) THEN
G(X,U)=G(X,U)+5ØØ:M(U)=M(U)-5ØØ/
1ØØ*L(X)
285Ø GOTO 282Ø
2855 RETURN
286Ø 'auto buy for hals
287Ø ' original buying
288Ø FOR X=1 TO 1Ø
289Ø RS=RND(6)
29ØØ G(RS,U)=G(RS,U)+1ØØØ
291Ø M(U)=M(U)-1ØØØ
292Ø NEXTX
293Ø U=1
294Ø GOTO 88Ø
```


# SPECIAL DEAL ON 500 PROGRAMS IS BACK!

**BACK BY POPULAR DEMAND! GET OUR LATEST 50 DISKS OR TAPES FULL OF OVER 500 PROGRAMS. HERE IS WHAT YOU'LL RECEIVE:**

★Over 250 Utility/Home Application Programs including a Word Processor, Database, Spreadsheet, Disk Utilities, Business Software, Electronics Series, Educational Programs for Kids, plus much more!

★Over 200 exciting games including King Pede, Kron, Star Trek, Flight Simulator, Wizard, Horse Races, Football, plus much more.

★Over 30 adventures including Rambo, Haunted House, Power Sword, Skid Row, plus 32k graphic adventures.

**Individual issues sell for $9.00 each or $450.00 for all 50. We slashed the price to only $150.00!**

REG. $450 NOW $150.00

**★★THIS MONTH ONLY★★**

Buy this package of 500 programs and receive a free 6 month subscription.

VISA

RAINBOW CERTIFICATION SEAL

# COOL DOWN TO OUR SUMMER PRICES ON SUBSCRIPTION SOFTWARE

THERE IS NO BETTER WAY TO ENJOY THE SUMMER THAN TREATING YOUR COLOR COMPUTER TO 10 READY-TO-RUN PROGRAMS EACH MONTH. GET 12 DISKS OR TAPES A YEAR CONTAINING OVER 120 QUALITY PROGRAMS. A SUBSCRIPTION TO T & D SOFTWARE CONSISTS OF 10 READY-TO-LOAD PROGRAMS DELIVERED BY FIRST CLASS MAIL EVERY MONTH.

NO, WE ARE NOT THE SAME AS THE RAINBOW ON TAPE. IN FACT, MANY SUBSCRIBERS HAVE WRITTEN IN AND SAID THAT WE ARE MUCH BETTER THAN RAINBOW ON TAPE!

**PRICES**

| | TAPE OR DISK | THIS MONTH ONLY |
|---|---|---|
| 1 YEAR (12 issues) | ~~70.00~~ | 60.00 |
| 6 MO. (6 issues) | ~~40.00~~ | 35.00 |
| 1 ISSUE | ~~9.00~~ | 8.00 |

Michigan Residents Add 4%
Overseas Add $10 to Subscription Price
Personal Checks Welcome!

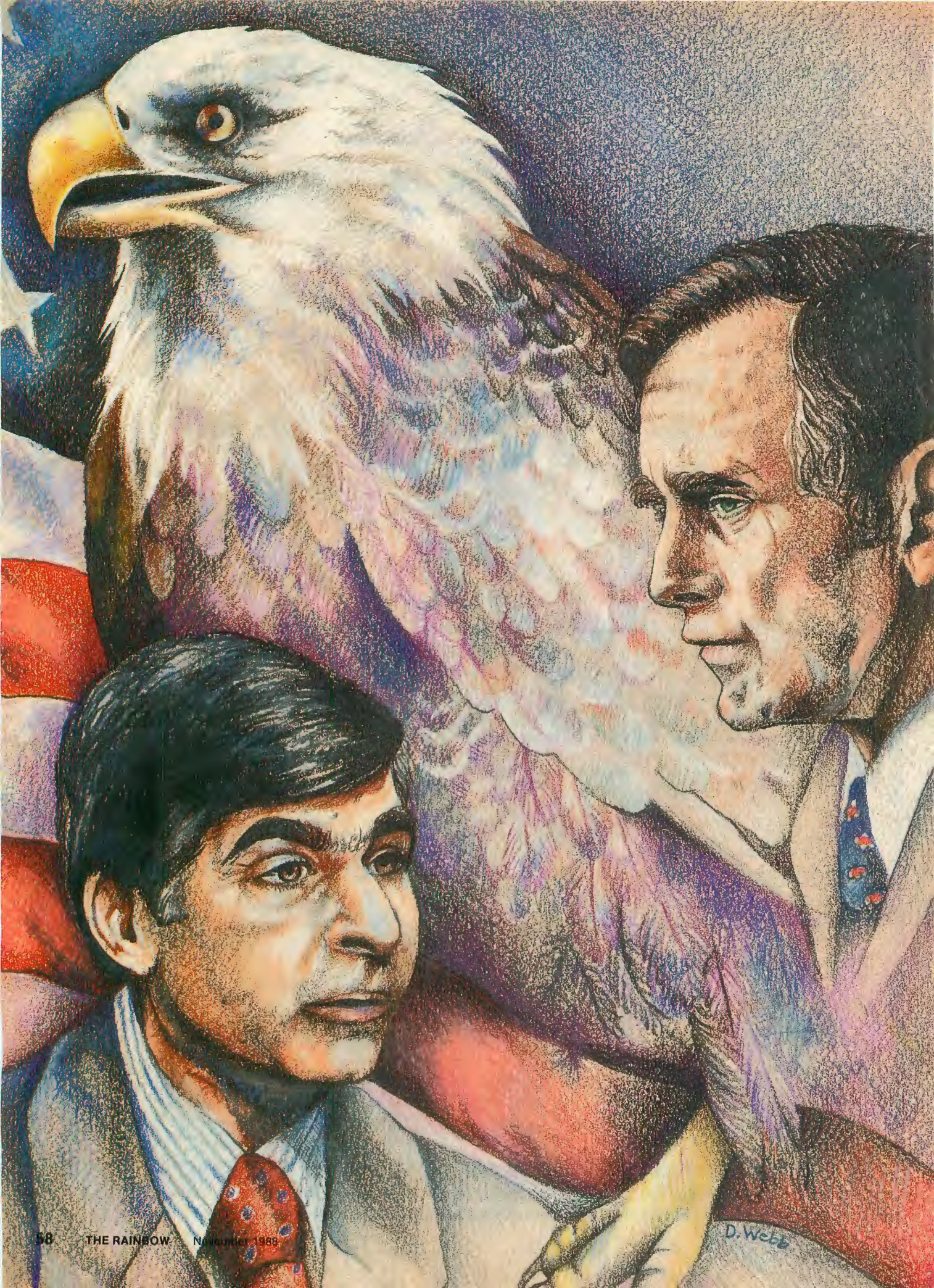
- ★ Available on COCO 1, 2, and 3
- ★ Includes Documentation
- ★ Over 4,500 Satisfied Customers
- ★ Back Issues Available From July '82 (Over 720 Programs)

TURN TO PAGES 22 & 23 FOR A COMPLETE LISTING

PLEASE SPECIFY TAPE OR DISK

MasterCard

**T & D SUBSCRIPTION SOFTWARE, 2490 MILES STANDISH DR., HOLLAND, MI 49424 (616) 399-9648**


D. Webb

*Use this program to keep track of election results and make your own predictions*



# Election '88

## By Leonard Hyre

Tuesday, November 8, 1988 — Election Day — is here. After hearing presidential debates, reading the newspaper and listening to your heart, you made your decision. You voted for your favorite presidential candidate.

Now you wait. You made your choice, but did the rest of America agree with you? Most of us will sit through the evening, listening to the election results. Many will let their children stay up a little late because this night (like all election nights) is an important part of our country's heritage. We may tell our children about the voting process, or we may explain our presidential choice.

Election night is both solemn and exciting, but it is also a waiting game. We watch or listen as the results are posted. We listen as the newspeople make predictions or try, once again, to explain the electoral college. We wait. Many of you would like to *do* something on election night, and your children may have difficulty following the television-posted results. But what can you do?

THE RAINBOW is proud to present Leonard Hyre's *Election '88*. This program lets you plot the progress of the election results *as they come in*. You don't have to wait for your favorite newscasters to give the results, explain their significance and make their predictions. With this program, you can enter the information, see the results and make your own predictions.

The presidential election is a vital part of our political system. Whether or not our candidate wins, we know that our votes count in the decision-making process. THE RAINBOW and Leonard Hyre are happy to give you and your family a program that will make this election's coverage a little more fun and interesting. Enjoy election night, and enjoy *Election '88*!

Soon we will elect a man to lead our nation for the next four years — the president of the United States. Like most Americans, my political sense is heightened during the time preceding our presidential election. I am, as we all are, involved in an important decision.

In July, I presented *Convention* as an aid in understanding and enjoying each party's nomination process. *Election '88* is a companion to the previous program. *Election '88* will help you and your family enjoy and understand the election process by letting you tabulate election results, review election history and predict the election's outcome.

***"Gather the family around on or before Election Eve and let them guess which candidate will carry each state."***

Let's begin with a brief explanation of our electoral system. Our president and vice president are not elected by popular vote. Instead, they are elected by electoral vote. When we vote for a president, we are actually voting for a particular party's right to send its *electors* to the electoral college. Each state and the District of Columbia sends as many electors as it has senators and representatives. There are 538 electoral votes available. To win the presidency or the vice presidency, a candidate needs at least 270 votes. If neither candidate receives enough electoral votes, the Senate and the House of Representatives will elect the president.

*Leonard Hyre is the author of Federal Hill Software's* Handicapper *series and a number of articles for* RAINBOW. *He also published several articles in* RAINBOW*'s sister publication, PCM, and is the author of* Sanyopoly, *a new Sanyo game from Michigan Software.*

*Election '88*'s main objective is to keep track of the electoral votes as election-day results become available. Entering the votes by state is the first option on the program menu. If you choose to enter state votes, Option 1, you are asked for the two-letter postal abbreviation of the appropriate state. The program then presents that state's number of electoral votes. The program then asks you to identify who has received the electoral votes by pressing the initial letter of the following choices: Democrat, Republican or Undecided. After you have entered this information, the program will ask you for the next state. When you have entered all current information, type XX to exit Option 1. Your responses are then added to previous information and the results are tabulated.

Option 2 presents an onscreen current status report, which shows the total votes accrued by both parties and indicates how each state has voted. Option 3 gives you the same information on a one-page printout. These options will help you keep track of the electoral votes and predict the outcome of the election — just like the pros.

Option 4 adds a touch of magic to the program. A map of the United States is created. As you identify the winning party in each state, the state is painted the appropriate color. Use this option to illustrate the evening's progress, or use the map to reinforce your children's (or your) knowledge of United States geography. There might even be a lesson or two about party distribution or a candidate's campaign practices in this map. You decide.

Option 5 is a History Submenu, which (as the heading suggests) sends the program to a submenu that presents four options:

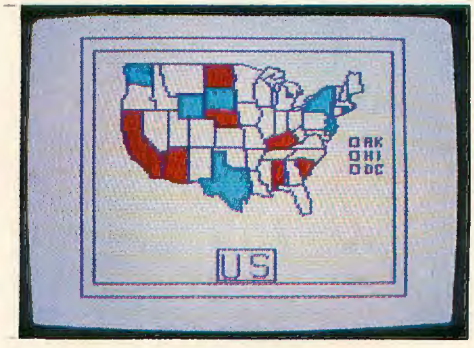
1. Democratic Tickets (1920 —)
2. Republican Tickets (1920 —)
3. U.S. Presidents (1920 to 1984)
4. Electoral College Facts

Selecting any one of these options sends you (or your child) to an information screen, which elaborates on the chosen subject. (This way, we won't just tally the electoral votes, we'll know how they work.

Menu Option 6 allows the user to save the data entries in progress and load them again at a later time. This will be most useful when using the last menu option to play "Political Predictions." Political Predictions is an option that lets you make a game out of the selection process. For this, gather the family around on or before Election Eve and let them guess which candidate will carry each state. After the final tabulations are in, *Election '88* will determine just how well the predictions match those of the electorate at large.

*Election '88*'s program structure is straightforward and simple. You should have little trouble following the program logic. The first few lines dimension the necessary data space and display the title screen. Next, program data is listed and read into memory. Be careful typing these data statements. They must be accurate. Next, the main menu information is listed. (See REM statements in the program.) The routines for each function follow. The routine that deals with state results (Option 1) provides the information needed for the other options.

For the map routine, I used DATA statements to provide the LINE statements with needed information. (This shortened the length of the code needed and the typing required to enter it.) After the program creates the map for the first time, it gets the entire U.S. map as a graphic array. Therefore, when the program recalls the map, it puts the map on screen and skips the data section of the program. This solves all the programming problems and presents the map almost instantly. Users do not have to wait for the DRAW statement to perform its laborious task each time the map is called.




Typing in and running *Election '88* should present no serious problems *if* you enter the correct data, including all commas. If you have any problems with the program, look at the appropriate DATA statements.

Enjoy *Election '88*. Let's hope "our" candidate wins!

*(Questions or comments concerning this program may be directed to the author at P.O. Box 403, Cambridge MD 21613. Please include an SASE when requesting a reply.)* □

# SUNDOG SYSTEMS

## Warrior King

Become RASTANN, Warrior King, on the quest to regain his rightful crown, hidden deep within a sinister land. Battle monsters, gain magic and weapons, and travel through harsh wilderness and dark castle dungeons in this medieval realm. From the creator of *Kung-Fu Dude* comes this awesome arcade game for the CoCo III! *Warrior King* uses the most detailed 320x200 16 color graphics and high speed machine code to vault you into a world of fantasy. Dare ye challenge the many perils ahead in order to become WARRIOR KING? Req. 128K CoCo III, disk drive, and joystick. Only $29.95.

## In Quest of the Star★Lord

This is THE graphic adventure for the CoCo III! Unparalleled 320x200 animated graphics will leave you gasping for more! You quest for the Phoenix Crossbow in this post-holocaust world of science and fantasy. *In Quest of the Star Lord* is a full 4 disk sides of mind-numbing adventure! Req. 128K CoCo III and disk drive. Only $34.95. Hint Sheet: $3.95.

*"A dynamite program! The best graphics I've seen to date on the CoCo III. You have to see it to believe it."*

*— 8/88 Rainbow review*

## Kung-Fu Dude

An exciting arcade game. The BEST karate game ever created for the CoCo! Destroy opponents and evade obstacles as you grow ever closer to your ultimate objective. Spectacular graphics, sound effects, and animation! Req. 64K CoCo, disk drive, and joystick. Only $24.95.

*"The CoCo karate gap has been filled and* Kung-Fu Dude *does it excellently. I highly recommend it!"*

*— 2/88 Rainbow review*

All programs CoCo 1, 2, 3 compatible, unless otherwise stated

## HALL of the KING TRILOGY

The epic adventure is back! The largest adventure campaign ever seen for the CoCo is again available! A total of six disks of intense graphic adventure will have you playing for weeks! Each section is a two-disk stand alone adventure, but all three together form an epic saga. Quest for the legendary Earthstone in the ancient dwelling of the dwarves while you enjoy the classic graphics that made this trilogy famous! Each adventure can be purchased separately for $29.95, the lowest price ever, or you can purchase the entire set for only $74.95! Req. 64K CoCo and disk drive.

*"One of the best adventures I have experienced to date!"* *— 6/86 Rainbow review*

*"The animated graphics are dramatic, detailed, and excellent!"* *—11/87 Rainbow review*

*"The adventure of a lifetime. Don't miss out!"* *— 7/88 Gamer's Connection review*

## CHAMPION

Become a superhero in this unique 64K action adventure. Great graphics and sound effects! See 5/87 Rainbow review. Disk $19.95.

## DRAGONBLADE

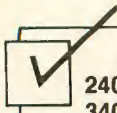
Another great 64K animated adventure! Can you obtain the enchanted sword to slay the evil dragon? See 11/86 Rainbow review. Disk $19.95.

## WHITE FIRE OF ETERNITY

Enter the era of monsters and magic in this splendid 64K animated adventure! See 12/86 Rainbow review. Disk $19.95.

Personal checks, money orders, and American C.O.D. orders accepted. Include $2.50 for S/H. $3.00 extra for C.O.D. orders. PA residents add 6% sales tax. Authorship and dealer inquires welcome.

**Sundog Systems**
21 Edinburg Drive
Pittsburgh, PA 15235
(412) 372-5674



```
240 .......12  1330 .....163  2480 ......94
340 .......65  1422 .......6  2600 ......89
420 .......31  1600 .......0  2690 .....205
500 .......64  1770 .....165  2790 .....109
700 ......251  1910 .....132  2940 ......53
840 ......248  2050 ......86  4010 ......23
1020 .......4  2230 .....139  4504 .......7
1184 .....206  2340 .....190  END .....197
```

**The listing:** ELECTION

```
1Ø '**************************
2Ø '*      ELECTION 88         *
3Ø '*    (C) 7/88 L HYRE       *
4Ø '*     CAMBRIDGE  MD        *
5Ø '* ************************
6Ø '
1ØØ DIM M(6ØØ):REM MAP ARRAY
11Ø DIM LS$(51),S$(51),S(51),EV(
51),DP$(17),DV$(17),RP$(17),RV$(
17),OV(51),DW(51),SV(51),WN(17),
PP(51)
12Ø '
13Ø '***** TITLE SCREEN *****
14Ø '
15Ø CLS5:PRINT STRING$(64,175);
16Ø FOR X=2TO14 STEP 2:PRINT@X*3
2, STRING$(32,159);:NEXT
17Ø FOR X=17Ø TO 298 STEP 32:PRI
NT@X,STRING$(12," ");CHR$(128);:
NEXT:PRINT@182,CHR$(2Ø7);
18Ø PRINT@331,STRING$(12,128);
19Ø PRINT@2Ø3,"*ELECTION*";:PRIN
T@237,"* 88 *";:PRINT@268,"COVER
AGE";:PRINT@299,"BY RAINBOW";
2ØØ '
21Ø ' ***** PROGRAM DATA *****
22Ø '
23Ø DATA ALABAMA,AL,1,9,ALASKA,A
K,2,3,ARIZONA,AZ,3,7
24Ø DATA ARKANSAS,AR,4,6,CALIFOR
NIA,CA,5,47,COLORADO,CO,6,8,CONN
ECTICUT,CN,7,8
25Ø DATA DELAWARE,DE,8,3,DIST OF
 COLUMBIA,DC,9,3,FLORIDA,FL,1Ø,2
1,GEORGIA,GA,11,12
26Ø DATA HAWAII,HI,12,4,IDAHO,ID
,13,4,ILLINOIS,IL,14,24
27Ø DATA INDIANA,IN,15,12,IOWA,I
O,16,8,KANSAS,KS,17,7,KENTUCKY,K
Y,18,9,LOUISIANA,LA,19,1Ø
28Ø DATA MAINE,ME,2Ø,4,MARYLAND,
MD,21,1Ø,MASSACHUSETTS,MA,22,13,
MICHIGAN,MI,23,2Ø
29Ø DATA MINNESOTA,MN,24,1Ø,MISS
ISSIPPI,MS,25,7,MISSOURI,MO,26,1
1,MONTANA,MT,27,4
3ØØ DATA NEBRASKA,NE,28,5,NEVADA
,NV,29,4,NEW HAMPSHIRE,NH,3Ø,4,N
EW JERSEY,NJ,31,16
31Ø DATA NEW MEXICO,NM,32,5,NEW
YORK,NY,33,36,NORTH CAROLINA,NC,
34,13,NORTH DAKOTA, ND,35,3
32Ø DATA OHIO,OH,36,23,OKLAHOMA,
OK,37,8,OREGON,OR,38,7
33Ø DATA PENNSYLVANIA,PA,39,25,R
HODE ISLAND,RI,4Ø,4
34Ø DATA SOUTH CAROLINA,SC,41,8,
SOUTH DAKOTA,SD,42,3,TENNESSEE,T
N,43,11,TEXAS,TX,44,29
35Ø DATA UTAH,UT,45,5,VERMONT,VT
,46,3,VIRGINIA,VA,47,12
36Ø DATA WASHINGTON,WA,48,1Ø,WES
T VIRGINIA,WV,49,6,WISCONSIN,WI,
5Ø,11,WYOMING,WY,51,3
37Ø DATA JAMES M. COX,FRANKLIN D
. ROOSEVELT,JOHN W. DAVIS,CHARLE
S W. BRYAN,ALFRED E. SMITH,JOSEP
H T. ROBINSON,FRANKLIN D. ROOSEV
ELT,JOHN N. GARNER,FRANKLIN D. R
OOSEVELT, JOHN N. GARNER,FRANKLI
N D. ROOSEVELT, HENRY A. WALLACE
38Ø DATA FRANKLIN D. ROOSEVELT,
HARRY S. TRUMAN, HARRY S. TRUMAN
, ALBEN W. BARKLEY, ADLAI E. STE
VENSON, JOHN J. SPARKMAN, ADLAI
E. STEVENSON, ESTES KEFAUVER, JO
HN F. KENNEDY, LYNDON B. JOHNSON
, LYNDON B. JOHNSON, HUBERT H. H
UMPHREY
39Ø DATA HUBERT H. HUMPHREY, EDM
UND S. MUSKIE, GEORGE S. MCGOVER
N, R. SARGENT SHRIVER JR., JIMMY
 CARTER, WALTER F. MONDALE, JIMM
Y CARTER, WALTER F. MONDALE
4ØØ DATA WALTER F. MONDALE, GERA
LDINE FERRARO
41Ø DATA WARREN G. HARDING, CALV
IN COOLIDGE, CALVIN COOLIDGE, CH
ARLES D. DAWES, HERBERT HOOVER,
CHARLES CURTIS, HERBERT HOOVER,
CHARLES CURTIS, ALFRED M. LANDON
, FRANK KNOX
42Ø DATA WENDELL L.WILKIE,CHARLE
S MCNARY,THOMAS E.DEWEY,JOHN W.B
RICKER,THOMAS E.DEWEY,EARL WARRE
N,DWIGHT D.EISENHOWER,RICHARD M.
NIXON,DWIGHT D.EISENHOWER,RICHAR
D M.NIXON,RICHARD M.NIXON,HENRY
CABOT LODGE
43Ø DATA BARRY M.GOLDWATER,WILLI
AM E.MILLER,RICHARD M.NIXON,SPIR
O T.AGNEW,RICHARD M.NIXON,SPIRO
T.AGNEW,GERALD R.FORD,ROBERT J.D
OLE,RONALD REAGAN,GEORGE BUSH,RO
NALD REAGAN,GEORGE BUSH
44Ø DATA 152,1ØØ,212,78,76,92,13
2,88
45Ø DATA 44,8Ø,92,72,2ØØ,52,192,
7Ø
```

```
46Ø DATA 212,98,172,116,164,1ØØ,
212,88
47Ø DATA 64,44,144,6Ø,156,6Ø,128
,56
48Ø DATA 1Ø8,76,16Ø,76,136,1Ø8,2
12,32
49Ø DATA 184,7Ø,2Ø4,48,16Ø,48,12
8,36
5ØØ DATA 144,1ØØ,132,72,8Ø,32,1Ø
8,6Ø
51Ø DATA 6Ø,72,2Ø4,44,196,64,92,
92
52Ø DATA 188,48,176,84,1Ø8,28,16
4,6Ø
53Ø DATA 12Ø,88,48,44,184,64,2Ø9
,53
54Ø DATA 176,98,1Ø8,44,16Ø,84,11
6,1Ø8
55Ø DATA 76,72,2ØØ,4Ø,18Ø,76,48,
28
56Ø DATA 172,72,14Ø,4Ø,88,52
57Ø DATA 2,2,2,1,1,1,1,1,2,2,1,1
,2,2,1,2,2
58Ø '
59Ø '****** READ IN DATA ******
6ØØ '
61Ø FOR X=1 TO 51:READ LS$(X),S$
(X),S(X),EV(X):NEXT
62Ø FOR X=1TO17:READDP$(X),DV$(X
):NEXT:FOR X=1TO17:READRP$(X),RV
$(X):NEXT
63Ø FOR X=1 TO 51:READ OV(X):REA
D DW(X):NEXT X
64Ø FOR X=1 TO 17:READ WN(X):NEX
T X
65Ø '
66Ø '**EXIT TITLE AFTER READ**
67Ø '
68Ø PRINT@464,"<PRESS ANY KEY>";
69Ø AK$=INKEY$:IF AK$=""THEN 69Ø
7ØØ '
71Ø '***** MAIN MENU HERE *****
72Ø '
73Ø CLS:PRINT STRING$(32,175);:P
RINT@33,"ELECTION COVERAGE BY RA
INBOW";:PRINT@64, STRING$(32,159
);
74Ø PRINT:PRINT"          MENU SELE
CTIONS....":PRINT:PRINT"   1>ENT
ER VOTING RESULTS":PRINT"   2>VI
EW  CURRENT VOTE STATUS":PRINT"
  3>PRINT CURRENT VOTE STATUS"
75Ø PRINT"   4>U.S.MAP WITH VOTE
 STATUS":PRINT"   5>HISTORY SUBM
ENU"
755 PRINT"   6>SAVE OR LOAD DATA
 FILE":PRINT"   7>PLAY";CHR$(34)
;"POLITICAL PREDICTION";CHR$(34)
76Ø PRINT:PRINT"    PRESS # OF S
ELECTION---";
77Ø AK$=INKEY$:IF AK$=""THEN 77Ø
```


# You can make all your Holiday Greeting Cards this season with the CoCo Graphics Designer

**The Coco Graphics Designer produces beautiful Greeting Cards, Banners, and Signs for holidays, birthdays and other occasions.**

The program features picture, border, and character font editors, so that you can modify or expand the already built in libraries. Plus a special "grabber" utility is included to capture areas of high resolution screens for your picture library.

**Coco Graphics Designer** .....**$29.95**

Optional Extra Font and Picture Disks:

**Font Disk A** 10 Fonts.....**$14.95**
Western, Stencil, Banner, Shadow, Variety, Type, Stripes, Digital, Bold3, Object.

**Font Disk B** 10 Fonts.....**$14.95**
Arcade, Circle, Alien, Cube, Baroque, Deco, Block, Gray, Computer, Script.

**Picture Disk #2** 4 sets of 30 pictures ea. **$14.95**
Sports, America, Party, Office.

**Picture Disk #3** 4 sets of 30 pictures ea. **$14.95**
Animals, Nature, Religion, Travel.

**Picture Disk #4** 120 Holiday Pictures: **$14.95**
Christmas, Chanukah, Thanksgiving, New Year's, Easter, Halloween, etc.

See our full page ad (page 53) in the October issue of Rainbow for sample picture and font printouts, or send for our free complete brochure.

**Requirements**: a Coco I, II or III with at least 32K, one disk drive, BASIC 1.0/1.1,ADOS 1.0/1.1 or JDOS. Printers supported include: Epson RX/FX, Gemini 10X, SG10, NX10, DMP 100/105/110/130/430 CGP220, many Okidata (check with Zebra), Seikosha GP100/250, Gorilla Banana, Legend 808. Ordering Instructions: All orders add $3.00 Shipping & Handling. UPS COD add $3.00. VISA/MC Accepted. NY residents add sales tax.

**Zebra Systems, Inc.**
**78-06 Jamaica Ave.**
**Woodhaven, NY 11421**
**(718) 296-2385**
*Orders shipped same or next day!*

```
78Ø IF VAL(AK$)>7 THEN 77Ø
79Ø IF AK$="1" THEN GOSUB 88Ø
8ØØ IF AK$="2" THEN GOSUB 112Ø
81Ø IF AK$="3" THEN GOSUB 133Ø
82Ø IF AK$="4" THEN GOSUB 152Ø
83Ø IF AK$="5" THEN GOSUB 162Ø
832 IF AK$="6" THEN GOSUB 4ØØØ
834 IF AK$="7" THEN GOSUB 45ØØ
84Ø GOTO 73Ø
85Ø '
86Ø '**** STATE RESULTS ****
87Ø '
88Ø CLS:PRINT STRING$(32,159):PR
INT@35,"VOTING RESULT ENTRY SCRE
EN":PRINT STRING$(32,175);
89Ø PRINT@448,STRING$(32,128);:P
RINT@484,"<ENTER XX FOR MAIN MEN
U>";
9ØØ PRINT@128,"ENTER STATE ABBRE
VIATION";:INPUT ST$
91Ø IF ST$="XX"THEN RETURN
92Ø FOR TEST=1 TO 51:IF ST$=S$(T
EST) THEN 95Ø
93Ø NEXT TEST
94Ø PRINT@128,"NO SUCH ABBREVIAT
ION! TRY AGAIN!":SOUND 1,1:FOR X
=1 TO 8ØØ:NEXT:GOSUB 3Ø7Ø:GOTO 8
8Ø
95Ø PRINT:PRINT"THE STATE OF ";L
S$(TEST):PRINT"WITH (";EV(TEST);
") VOTES HAS VOTED:"
96Ø PRINT"<D>EMOCRAT   <R>EPUBLI
CAN"
97Ø PRINT"<U>NDECIDED":PRINT:PRI
NT"ENTER D, R, OR U "
98Ø AK$=INKEY$:IF AK$=""THEN 98Ø
99Ø SV(TEST)=Ø:IF AK$="U" THEN 1
Ø7Ø
1ØØØ IF AK$="D" THEN SV(TEST)=1
1Ø1Ø IF AK$="R" THEN SV(TEST)=2
1Ø2Ø DV=Ø:RV=Ø
1Ø3Ø FOR X=1 TO 51
1Ø4Ø IF SV(X)=1 THEN DV=DV+EV(X)
1Ø5Ø IF SV(X)=2 THEN RV=RV+EV(X)
1Ø6Ø NEXT X
1Ø7Ø GOSUB 3Ø7Ø:GOTO 88Ø
1Ø8Ø RETURN
1Ø9Ø '
11ØØ '** SCREEN STATUS REPORT **
111Ø '
112Ø CLS:PRINT"UPDATE OF CURRENT
 STATUS":PRINT STRING$(32,175);"
NEEDED TO WIN: 27Ø VOTES"
113Ø PRINT@96,"DEMOCRATIC CURREN
T TOTAL =";:PRINT USING"###";DVD
V
114Ø PRINT@128,"REPUBLICAN CURRE
NT TOTAL =";:PRINT USING"###";RV
115Ø PRINT STRING$(32,159);:PRIN
T"STATE/DC     VOTES   RESULTS"
116Ø ZZ=1:XC=Ø:XV=Ø
117Ø FOR X=224 TO 384 STEP 32:PR
INT@X,LS$(ZZ)
118Ø PRINT @X+16,;:PRINT USING"#
#";EV(ZZ)
1182 XT$=" "
1183 IF SV(ZZ)=1 AND PP(ZZ)=1 TH
EN XT$="*":XC=XC+1
1184 IF SV(ZZ)=2 AND PP(ZZ)=2 TH
EN XT$="*":XC=XC+1
119Ø IF SV(ZZ)=1 THEN PRINT@X+19
,"DEMOCRATIC";XT$:ELSE IF SV(ZZ)
=2 THEN PRINT@X+19,"REPUBLICAN";
XT$:ELSE PRINT@X+19,"----------
";XT$
1191 IF SV(ZZ)<>Ø THEN XV=XV+1
12ØØ ZZ=ZZ+1
121Ø IF ZZ/6=INT(ZZ/6) THEN 122Ø
 ELSE GOTO 125Ø
122Ø PRINT:PRINT"<PRESS ANY KEY>
"
123Ø AK$=INKEY$:IF AK$=""THEN 12
3Ø
124Ø FOR Y=224 TO 416 STEP 32:PR
INT@Y,STRING$(32," "):NEXT Y:GOT
O 117Ø
125Ø IF ZZ=51 THEN 1265
126Ø NEXT X
1265 IF XV>Ø THEN PRINT:PRINT"YO
UR PREDICTIONS:":PRINT"YOU HAVE
";XC;"OUT OF";XV;"CORRECT":PRINT
"FOR A";INT((XC/XV)*1ØØ);" % ACC
URACY RATE."
127Ø PRINT@448,STRING$(32,128);:
PRINT@488,"< PRESS ANY KEY >";
128Ø AK$=INKEY$:IF AK$=""THEN 12
8Ø
129Ø RETURN
13ØØ '
131Ø '** PRINTOUT STATUS **
132Ø '
133Ø CLS:PRINT STRING$(32,159):P
RINT@38,"PRINTOUT CURRENT STATUS
":PRINT STRING$(32,175);
134Ø PRINT:PRINT"MAKE SURE PRINT
ER IS READY!"
135Ø PRINT:PRINT"PRESS <P> TO PR
INT":PRINT
136Ø PRINT"ANY OTHER KEY TO RETU
RN TO MENU"
137Ø AK$=INKEY$:IF AK$=""THEN 13
7Ø
138Ø IF AK$="P"THEN 139Ø ELSE GO
SUB 3Ø7Ø:RETURN
139Ø PRINT#-2,STRING$(8Ø,"-"):PR
INT#-2,"ELECTION NIGHT 88 - COVE
RAGE BY RAINBOW          *=CORR
ECT PREDICTION"
14ØØ PRINT#-2,STRING$(8Ø,"-")
14Ø5 XC=Ø:XV=Ø
141Ø FOR X=1 TO 51:PRINT#-2,LS$(
X);:PRINT #-2,TAB(24);S$(X);:PRI
```

*Making the* COMPUTER CENTER **MicroWorld** *of Computers*

*Affordable.....*

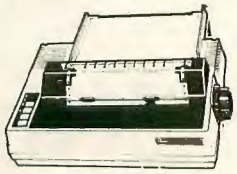
MicroWorld II
PO Box 5330
Clinton, NJ 08891

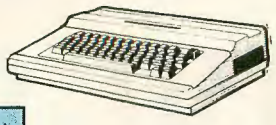
Since 1982

MicroWorld
PO Box 69
Wind Gap, Pa. 18091

Since 1982

CALL: In Pa: (215) 863-8911
In NJ: (201) 735-6138





**Free Shipping*** | **100% TANDY Products***

## CoCo

| | |
|---|---|
| CoCo III, 128K | $145.00 |
| CM-8 | $248.00 |
| Magnavox-8CM515 w/cbl | $317.00 |
| FD-502 Drive 0, CoCo | $225.00 |
| DMP-106 | $165.00 |
| DMP-132 | $275.00 |
| SEIKOSHA SP1000 100cps Same as DMP-130 | $159.00 |
| SEIKOSHA SP1200 120cps Same as DMP-130A/132 | $199.00 |
| Star Micronics NX15 | $399.00 |
| Star Micronics NX1000 | $199.00 |
| CCr-81 | $43.00 |
| Joysticks (Pair) | $13.00 |
| Color Mouse | $33.00 |
| Deluxe Color Mouse | $38.00 |
| Joystick - DELUXE | $24.00 |
| Serial Cables | $3.25 |
| Hi-Res Joystick Interf. | $8.00 |

## CoCo Upgrades

| | |
|---|---|
| CoCo III, 512K UPGRADE | $145.00 |
| Multi-pak upgrade OLD | $12.00 |
| Multi-pak upgrade NEW | $12.00 |

## COMPUTERS

| | |
|---|---|
| TANDY 1000 HX Computer | $535.00 |
| TANDY 1000 TX Computer | $860.00 |
| TANDY 1400 LT | $1295.00 |
| TANDY 3000 | $1475.00 |
| TANDY 3000 HL | $1090.00 |
| TANDY 4000 | $1890.00 |

## MONITORS

| | |
|---|---|
| VM-4 Monochrome Monitor | $95.00 |
| CM-5 RGB Color Monitor | $220.00 |
| CM-11 RGB Color Monitor | $310.00 |
| EGM-1 color Monitor | $525.00 |
| CM-8 | $248.00 |
| Magnavox - 8 CM 515 | $298.00 |

## HARD CARDS

| | |
|---|---|
| TANDY 20 Meg Hd Card | $439.00 |
| 30 Meg ZUCKER | $499.00 |

## HARD DISKS

(Kits include cable & controller)

| | |
|---|---|
| Seagate 20 Mg Kit | $299.00 |
| Seagate 30 Mg Kit | $349.00 |
| Seagate 40 Mg Kit(no controller) | $399.00 |

## FLOPPY DRIVES

TEAC Internal:

| | |
|---|---|
| TEAC 5 1/4 Disk-360kb | $99.00 |
| TEAC 3 1/2 Disk-720kb | $119.00 |

## FLOPPY DRIVES

*Radio Shack:*

External:

| | |
|---|---|
| 5 1/4 Ext. Drive-HX/EX | $180.00 |
| 3 1/2 Ext. Drive-HX/EX | $199.00 |

Internal:

| | |
|---|---|
| 5 1/4 Disk-360kb | $125.00 |
| 3 1/2 Disk-720kb | $125.00 |
| 3 1/2 to 5 1/4 Adapter | $24.00 |
| 5 1/4 1.2M FDD Kit | $215.00 |
| 5 1/4 360K FDD Kit | $140.00 |

## PRINTERS

| | |
|---|---|
| DMP-106 (Special) | $165.00 |
| DMP-132 | $275.00 |
| DMP 440 | $545.00 |
| DWP-520 | $719.00 |
| DMP 2120 | $1279.00 |
| LP1000 Laser | $1899.00 |
| SEIKOSHA SP1000 (DMP-130) | $159.00 |
| SEIKOSHA SP1200 (DMP-132) | $199.00 |
| Star Micronics NX15 | $399.00 |
| Star Micronics NX1000 | $199.00 |

## BOARDS

| | |
|---|---|
| Smart Watch | $30.00 |
| Plus Upgrade Adapter Bd | $12.50 |
| Memory Plus Expansion BD | $110.00 |
| EGA Adapter | $185.00 |

## MODEMS

| | |
|---|---|
| 1200 Baud Pc Modem | $159.00 |
| Plus 300 Baud Pc Modem | $75.00 |
| Plus 1200 Baud PC Modem | $150.00 |

## MISC

| | |
|---|---|
| Serial Mouse | $36.00 |
| Joystick - DELUXE | $24.00 |
| Monitor Platform | $24.00 |
| Ribbons - DMP-130 | $8.00 |
| Ribbons - DMP-105/106 | $5.50 |
| Flips - R/S | $11.00 |
| Disk Clean Kits | $5.00 |
| Cover - DMP-105/6 | $3.00 |
| Cover - CoCo II/III | $3.00 |
| Cover - DMP-130 | $3.00 |
| Bulk Erasers | $12.00 |
| Flip n' Files w/lock (3-1/2 or 5-1/4) | $11.00 |
| Library Case-Black | $1.50 |
| Library Case-Tan | $2.00 |
| Paper- Mini 20# | $4.00 |
| Paper #15 | $14.00 |
| Paper #20 | $10.00 |

## DISKS

| | |
|---|---|
| Tandy SS 5 1/4 Disks | $9.00 |
| Tandy DS 5 1/4 Disks | $10.00 |
| Tandy DS 3 1/2 Disks | $28.00 |
| Winners DS/DD W/Lib case | $7.50 |
| Winners SS/DD W/Lib case | $7.00 |

Software

| | |
|---|---|
| OS-9 Level II | $63.95 |
| Multi-View | $39.95 |
| Deskmate 3 | $79.95 |
| Other Titles | 20% off |

* 100% TANDY Warranty on TANDY products - Manufacturer's Warranty applies on all other items.
* FREE UPS shipping on orders over $50 (In the Continental US) - under $50 add $5 for shipping.
* The above prices are CASH prices - add 3% for credit cards. No COD's will be taken. Prices may be slightly higher in our retail stores.
* All returns must have prior authorization and are subject to a re-stocking fee.

# HOWARD MEDICAL COMPUTERS

1690 N. Elston • Chicago, IL 60622 • ORDERS (800) 443-1444 • INQUIRIES AND ORDER STATUS (312) 278-1440

★ 5 STAR FINAL NOVEMBER '88 RAINY

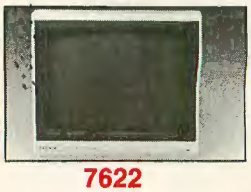
# HMC CUTS 515 to $266

Hundreds of $ off Monitors sighted as Major Factor. HMC is reported to have made a special purchase on Magnavox monitors. These items, listed, are being offered at remarkable savings.

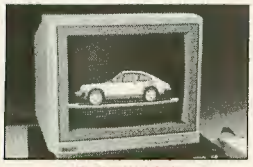
**MAGNAVOX 7622** 12" Amber Screen offers 900 dots × 350 lines resolution at 20 MHz on a dark glass anti-glare CRT with built-in audio and 1 year warranty. ($7 shipping) **$88** 7652 green screen also available $88

**MAGNAVOX 8CM 515** has analog RGB for CoCo 3, TTL RGB for Tandy 1000 or IBM PC's, and composite color for CoCo 2 and 3. Built-in speaker. 14" screen with 640 dot × 240 line resolution. Plus 2 years parts and labor warranty. reg. list $499 **was $298** **$266** + $14 Shipping

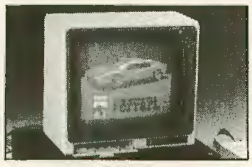
**CC-3 Magnavox RGB cable only $19.95** with Magnavox Monitor order. $29.95 w/o monitor.



7622



8CM515

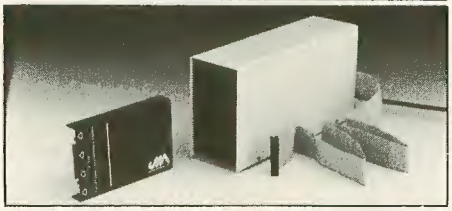


123A

**123A 12"** This 12" green screen high resolution monitor offers 80 column capability, Zenith quality and a 90-day warranty valid at any of Zenith's 1200 locations. Retail $199. **Our price $67.50** ($7 shipping) **REPACK**

VA-1 for monochrome and color monitors delivers video interface for CoCo's 1 & 2 **$29.45** ($2 shipping)

**DRIVE Ø +.** ***Howards Drive Ø*** gives you a DD-3 MPI drive, a CA-1 cable and a HDS DC-5 Disk Controller for only **$178.45.** Double sided double density 360K. ($5 shipping)
No charge for Disto DC-3 upgrade



## HMC's Guarantee– A Promise you can take to the Bank.

Howard Medical's 30-day guarantee is meant to eliminate the uncertainty of dealing with a company through the mail. Once you receive our hardware, try it out; test it for compatibility. If you're not happy with it for any reason, return it in 30 days and we'll give you your money back (less shipping.) Shipping charges are for 48 states. APO, Canada and Puerto Rico orders are higher.

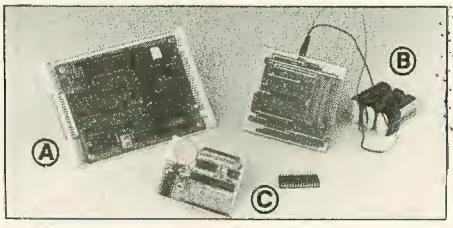
## Price Break on DISTO Disk Controllers

Includes controller and C-DOS 4.0 ROM Chip. **DISTO $75** DC-3 [A] ($2 shipping on all DISTO products)

## ADD-ON BOARDS

DC-3P Mini Eprom programmer includes all software to program 2764 or 27128 chips [B] **$55**

DC-3C Clock Calendar and parallel printer port [C] **$40**




**RS-232** **$49.95** ($2 ship)

Replaces R.S. RS-232 board. Plugs in drive port or multi pack. 2 MHz operation works with OS-9.

**MEB** **$30** ($2 ship)

Plugs into multi pak to expand DISTO DC-3 bus. Use clock in DC-3 and eprom programmer in MEB.

## hotline number

DON'T MISS OUT, DON'T MISS OUT, ORDER TODAY!

**800 / 443-1444**

WE ACCEPT VISA • MASTERCARD • AMERICAN EXPRESS • C.O.D. OR CHECKS • SCHOOL P.O.
NEW — DISCOVER CARD

```
NT#-2,TAB(4Ø);"Votes =";
1411 XT$=" "
142Ø PRINT #-2,USING "##";EV(X);
1421 IF SV(X)=1 AND PP(X)=1 THEN
 XT$="*":XC=XC+1
1422 IF SV(X)=2 AND PP(X)=2 THEN
 XT$="*":XC=XC+1
1423 IF SV(X)<>Ø THEN XV=XV+1
143Ø IF SV(X)=1 THEN PRINT#-2,TA
B(58);"DEMOCRATIC";XT$
144Ø IF SV(X)=2 THEN PRINT#-2,TA
B(58);"REPUBLICAN";XT$
145Ø IF SV(X)=Ø THEN PRINT#-2,TA
B(58);"----------"
146Ø NEXT X
147Ø PRINT#-2,STRING$(8Ø,"-"):PR
INT#-2,"DEMOCRATS HAVE ";DV;" VO
TES.";:PRINT#-2,TAB(4Ø);"REPUBLI
CANS HAVE ";RV;" VOTES."
1475 IF XV>Ø THEN PRINT#-2,"YOUR
 PREDICTIONS:";XC;" OUT OF ";XV;
" FOR A ";INT((XC/XV)*1ØØ);"% CO
RRECT SELECTON RATE"
148Ø RETURN
149Ø '
15ØØ '**** MAP FUNCTIONS ****
151Ø '
152Ø GOSUB 233Ø
153Ø FOR X=1 TO 51
154Ø IF SV(X)=1 THEN PAINT(OV(X)
,DW(X)),Ø,3
155Ø IF SV(X)=2 THEN PAINT(OV(X)
,DW(X)),2,3
156Ø NEXT X
157Ø AK$=INKEY$:IF AK$=""THEN 15
7Ø
158Ø RETURN
159Ø '
16ØØ '**** HISTORY SUBMENU ****
161Ø '
162Ø CLS:PRINT STRING$(32,159);"
* HISTORICAL INFORMATION  MENU *
";STRING$(32,2Ø7)
163Ø PRINT@129,"1> DEMOCRATIC TI
CKETS (192Ø-)"
164Ø PRINT@161,"2> REPUBLICAN TI
CKETS (192Ø-)"
165Ø PRINT@193,"3> U.S.PRESIDENT
S (192Ø-1984)":PRINT@225,"4> ELE
CTORAL COLLEGE FACTS"
166Ø PRINT@289,"ENTER 1,2,3 OR 4
 TO SELECT-"
167Ø PRINT@321,"ANY OTHER KEY FO
R MAIN MENU"
168Ø FY=192Ø
169Ø AK$=INKEY$:IF AK$=""THEN 16
9Ø
17ØØ IF VAL(AK$)>4 THEN SOUND 1,
```


**JR & JR SOFTSTUFF**

Can't find it? We'll write it!

**Yahtzzz*** a timeless classic for hours of family fun. (CoCo 1,2,3)...$12.95

**DISKEASE*** get your disk problems under control. COPY, KILL, RENAME multiple files with one keystroke! Backup & restore directories. Print a hard copy of a directory to aid in restoring a damaged directory. (CoCo 3 only)...$24.95

**BURIED BUXX** Pilot your chopper into position, uncover the BUXX & return to base, but watch out for hidden missiles and enemy bombs! (CoCo 1,2 or 3)...$19.95

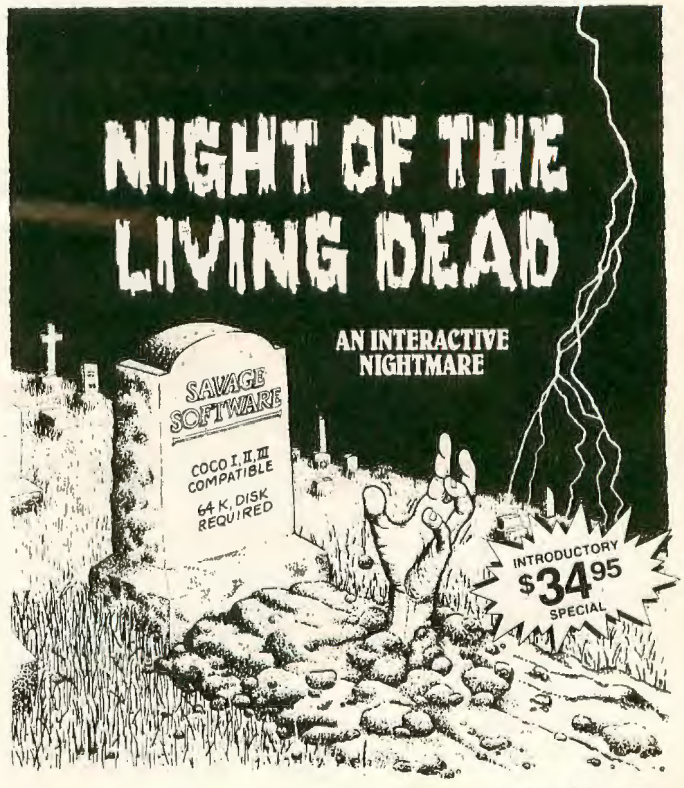
**FONTGEN** Create custom fonts & customize palette colors for use in ANY BASIC program & some M/L programs. (CoCo 3 only).....$19.95

**Quantum Leap** 1-4 players leap into a new dimension of fun! 6 dice makes all the difference. (CoCo 3 only).....$19.95

**Picture Puzzles** Jigsaw puzzle fun for all ages. Kids love 'em. (CoCo 3 only).....$19.95

*BASIC-M/L HYBRID.
OTHERS ARE 100% MACHINE LANGUAGE.
VISA, M/C, C.O.D., CHECKS ACCEPTED.
ALL ORDERS ADD $3.00 P&H.
CALIFORNIA RES. ADD 6% TAX.
P.O. BOX 118, LOMPOC, CA 93438
ORDER 24 HRS. (805) 735-3889






ADVENTURE NOVEL SOFTWARE

P.O. BOX 8176, SPARTANBURG, SC 29305

24 hr. order HOTLINE
(803) 578-7421
C.O.D. ADD $5

```
1:GOTO 169Ø
171Ø IF AK$="1" THEN 179Ø
172Ø IF AK$="2" THEN 195Ø
173Ø IF AK$="3" THEN 211Ø
174Ø IF AK$="4" THEN 225Ø
175Ø RETURN
176Ø '
177Ø '** DEMOCRATIC NOMINEES **
178Ø '
179Ø CLS:PRINT STRING$(32,159);"
DEMOCRATIC PARTY NOMINEES-":PRIN
T STRING$(32,2Ø7):PRINT" YEAR...
.CANDIDATES":SS=16Ø
18ØØ FOR X=1 TO 17:PRINT@SS,FY;"
   ";DP$(X):PRINT@SS+41,DV$(X)
181Ø SS=SS+96:FY=FY+4
182Ø IF X/3<>INT(X/3) THEN 184Ø
ELSE PRINT@48Ø,"<PRESS ANY KEY>"
;:AK$=INKEY$:IF AK$=""THEN 182Ø
183Ø FOR WP=16Ø TO 384 STEP 32:P
RINT@WP,STRING$(32," "):NEXT WP:
SS=16Ø
184Ø NEXT X
185Ø PRINT@48Ø,"<P=PRINT-ANY OTH
ER=MAIN MENU>";
186Ø AK$=INKEY$:IF AK$=""THEN 18
6Ø ELSE IF AK$="P"THEN 187Ø ELSE
 RETURN
187Ø PRINT#-2,STRING$(8Ø,"-"):PR
INT#-2,"DEMOCRATIC CANDIDATES FO
R PRESIDENT/VICE PRESIDENT (192Ø
-1984)":PRINT#-2,STRING$(8Ø,"-")
188Ø FY=192Ø:FORX=1TO17
189Ø IF WN(X)=1 THEN WN$="*" ELS
E WN$=""
19ØØ PRINT#-2,FY;TAB(1Ø);"PRESID
ENT:";DP$(X);WN$;TAB(5Ø);"VP:";D
V$(X):PRINT#-2,"":FY=FY+4:NEXT X
191Ø PRINT#-2,STRING$(8Ø,"-"):PR
INT#-2,"* = Winner In Election":
RETURN
192Ø '
193Ø '** REPUBLICAN NOMINEES **
194Ø '
195Ø CLS:PRINT STRING$(32,159);"
REPUBLICAN PARTY NOMINEES-":PRIN
T STRING$(32,2Ø7):PRINT" YEAR...
.CANDIDATES":SS=16Ø
196Ø FOR X=1 TO 17:PRINT@SS,FY;"
   ";RP$(X):PRINT@SS+41,RV$(X)
197Ø SS=SS+96:FY=FY+4
198Ø IF X/3<>INT(X/3) THEN 2ØØØ
ELSE PRINT@48Ø,"<PRESS ANY KEY>"
;:AK$=INKEY$:IF AK$=""THEN 198Ø
199Ø FOR WP=16Ø TO 384 STEP 32:P
RINT@WP,STRING$(32," "):NEXT WP:
SS=16Ø
2ØØØ NEXT X
2Ø1Ø PRINT@48Ø,"<P=PRINT-ANY OTH
ER=MAIN MENU>";
2Ø2Ø AK$=INKEY$:IF AK$=""THEN 2Ø
2Ø ELSE IF AK$="P"THEN 2Ø3Ø ELSE
 RETURN
2Ø3Ø PRINT#-2,STRING$(8Ø,"-"):PR
INT#-2,"REPUBLICAN CANDIDATES FO
R PRESIDENT/VICE PRESIDENT (192Ø
-1984)":PRINT#-2,STRING$(8Ø,"-")
2Ø4Ø FY=192Ø:FORX=1TO17
2Ø5Ø IF WN(X)=2 THEN WN$="*" ELS
E WN$=""
2Ø6Ø PRINT#-2,FY;TAB(1Ø);"PRESID
ENT:";RP$(X);WN$;TAB(5Ø);"VP:";R
V$(X):PRINT#-2,"":FY=FY+4:NEXT X
2Ø7Ø PRINT#-2,STRING$(8Ø,"-"):PR
INT#-2,"* = Winner In Election":
RETURN
2Ø8Ø '
2Ø9Ø '**** PRESIDENTS ****
21ØØ '
211Ø CLS:PRINT STRING$(32,2Ø7);"
PRESIDENTS OF THE UNITED STATES
";STRING$(32,159)
212Ø FOR X=1 TO 17
213Ø IF X=9 THEN 214Ø ELSE 216Ø
214Ø PRINT:PRINT"<PRESS ANY KEY>
"
215Ø AK$=INKEY$:IF AK$=""THEN 21
5Ø ELSE:FOR WP=128 TO 448 STEP 3
2:PRINT@WP,STRING$(32," ");:NEXT
 WP:PRINT@128,"";
216Ø IF WN(X)=1 THEN PRINT FY;"
  ";DP$(X)
217Ø IF WN(X)=2 THEN PRINT FY;"
  ";RP$(X)
218Ø FY=FY+4
219Ø NEXT X
22ØØ PRINT@448,"<PRESS ANY KEY>"
;
221Ø AK$=INKEY$:IF AK$=""THEN 22
1Ø ELSE RETURN
222Ø '
223Ø '** ELECTORAL COLLEGE **
224Ø '
225Ø CLS:PRINTSTRING$(32,159):PR
INT@38,"ELECTORAL COLLEGE":PRINT
STRING$(32,2Ø7);
226Ø PRINT"   THE PRESIDENT AND
VP ARE":PRINT"ELECTED  BY THE  E
LECTORAL":PRINT"COLLEGE. EACH ST
ATE AND DC HAVE AS MANY ELECTORS
 AS SENATORS":PRINT"AND REPRESEN
TATIVES.WE ACTUALLY":PRINT"VOTE
FOR ELECTORS."
227Ø PRINT"   THERE ARE 538 VOTE
S. TO WIN, A CANDIDATE NEEDS 27Ø
 VOTES. IF":PRINT"NO CANDIDATE G
ETS THE NEEDED":PRINT"MAJORITY,
THE HOUSE AND SENATE":PRINT"ELEC
T THE PRESIDENT."
228Ø PRINT@484,"<PRESS ANY KEY>"
;
229Ø AK$=INKEY$:IF AK$=""THEN 22
```

# The Biggest
# The Best
# The Indispensable

The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE

**THE RAINBOW** is the biggest, best, brightest and most comprehensive publication a happy CoCo ever had! **THE RAINBOW** features more programs, more information and more in-depth treatment of the Tandy Color Computer than any other source.

A monthly issue contains nearly 200 pages and up to two dozen programs, 14 regular columns and as many as 12 new product reviews. And advertisements: **THE RAINBOW** is known as *the* medium for advertisers — which means every month it has a wealth of information unavailable anywhere else about new products! Hundreds of programs are advertised in its pages each month.

Every single issue of **THE RAINBOW** covers the wide spectrum of interests in the Tandy Color Computer — from beginners' tutorials and arcade games to telecommunications and business and finance programs. Helpful utilities and do-it-yourself hardware projects make it easy and fun to expand your CoCo's capabilities. And, monthly reviews by independent reader reviewers take the guesswork out of buying new software and hardware products.

Join the tens of thousands who have found **THE RAINBOW** to be an absolute necessity for their CoCo. With all this going for it, is it surprising that more than 90 percent of **THE RAINBOW** subscribers renew their subscriptions? We're willing to bet that, a year from now, you'll be doing the same.

## *Rainbow On Tape & Rainbow On Disk!*

— great ways to bring **THE RAINBOW** into your life. Each month, all you do is pop the tape into your cassette player or the disk into your drive. No more lost weekends. As soon as you read an article about a program in **THE RAINBOW**, it's ready to load and run. No work. No wait.

Just think how your software library will grow. With your first year's subscription, you'll get almost 250 new programs: games, utilities, business programs, home applications. And, with **RAINBOW ON DISK**, you'll also get all the OS-9 programs.

**RAINBOW ON TAPE** and **RAINBOW ON DISK** — they're the "meat" of **THE RAINBOW** at a price that's "small potatoes." And now you even have a choice about how it should be served up to you.

To get your first heaping helping, just fill out and return the attached reply card. No postage necessary.

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 1 PROSPECT, KY

POSTAGE WILL BE PAID BY ADDRESSEE

The RAINBOW®
THE COLOR COMPUTER MONTHLY MAGAZINE

**The Falsoft Building**
**P.O. Box 385**
**Prospect, KY 40059-9989**

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 1 PROSPECT, KY

POSTAGE WILL BE PAID BY ADDRESSEE

The RAINBOW®
THE COLOR COMPUTER MONTHLY MAGAZINE

**The Falsoft Building**
**P.O. Box 385**
**Prospect, KY 40059-9989**

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

# Use our 800 number!

For credit card orders, you may want to phone in your subscription. Our *credit card order* number is (800) 847-0309, 8 a.m. to 5 p.m. EST. All other inquiries please call (502) 228-4492.
We accept VISA, MasterCard and American Express.
Subscriptions to **THE RAINBOW** are $31 a year in the United States. Canadian rate is $38 (U.S. funds only). Surface rate elsewhere is $68 (U.S.). Airmail is $103 (U.S.). All subscriptions begin with the current issue. Please allow 6 to 8 weeks for the first copy. Kentucky residents add 5% sales tax.
In order to hold down non-editorial costs, we do not bill.

# Our 800 number is also good for ordering RAINBOW ON TAPE or RAINBOW ON DISK!

Just call (800) 847-0309 anytime from 8 a.m. to 5 p.m. EST. *Credit card orders only.*
Subscriptions to **RAINBOW ON TAPE** are $80 a year in the United States, $90 (U.S. funds) in Canada and $105 (U.S.) in all other countries.
**RAINBOW ON DISK** is $99 a year in the United States, $115 (U.S.) in Canada and $130 (U.S.) in all other countries.
Individual issues of **RAINBOW ON TAPE** are $10 in the U.S., $12 (U.S.) in Canada and all other countries. Individual issues of **RAINBOW ON DISK** are $12 in the U.S., $14 (U.S.) in Canada, and $16 (U.S.) in all other countries. Kentucky residents please add 5% sales tax.
**RAINBOW ON TAPE** and **RAINBOW ON DISK** are not stand-alone products; you need the magazine for loading and operating instructions and the necessary documentation. **THE RAINBOW** magazine is a separate purchase.

# Send Me Rainbow Magazine!

Here's your chance to have a Pot O' Gold full of programs, articles and information about CoCo every month of the year!
As the premier magazine for the Tandy Color Computer, **THE RAINBOW** has more of everything — and greater variety, too. Do yourself and your CoCo a favor and subscribe to **THE RAINBOW** today!

YES! Sign me up for a year (12 issues) of **THE RAINBOW.**

☐ *NEW* ☐ *RENEW (attach label)*

*Name* _____

*Address* _____

*City* _____ *State* _____ *ZIP* _____

☐ Payment Enclosed (payment must accompany order)

Charge: ☐ VISA ☐ MasterCard ☐ American Express

Account Number _____

Signature _____ Card Expiration Date _____

# Give Your Fingers A Break!

YES! Sign me up: ☐ *NEW* ☐ *RENEW (attach label)*

☐ *RAINBOW ON TAPE* ☐ *RAINBOW ON DISK (Available beginning with the October 1986 issue)*

☐ *A Full Year* ☐ *Single Issue (specify month & year)* _____

Name _____

Address _____

City _____ State _____ ZIP _____

☐ Payment Enclosed (payment must accompany order)

Charge: ☐ VISA ☐ MasterCard ☐ American Express

Account Number _____

Signature _____ Card Expiration Date _____

# OWL-WARE

## Proven Technology

## New CoCo 3 Utilities

Great for 512K Systems! From Color Venture and OWL-WARE

### PRINTER LIGHTNING

A great print spooler which gives you 44K print buffer from a 128K CoCo and up to 438K (200 pages!) from a 512K CoCo. With this spooler you can run a program while you are printing a file. The spooler does not slow down the computer to any noticeable extent while you are running a second program and no lost characters arise. Baud rates selectable. ***Printer Lightning*** can reside in memory along with ***RAMDISK***!

### RAMDISK

Using 512K CoCo 3 you have access to 2 additional disk drives in RAM. All disk commands are supported, and the data are Reset button protected. You can now have up to 5 disk drive capacities on line at once and can assign the ram disks to any drive number. By making the ramdisk Drive 0, all programs which require a lot of drive access will run much faster. You can have the ***RAMDISK*** in memory at the same time as the ***Printer Lightning***!

### BACKUP LIGHTNING

This program is the fastest way to make backup copies of your files using a 512K CoCo. You can backup 35, 40, or 80 track disks single or double sided. Both RS and OS-9 disks may be backed up. The original disk is saved to memory and a copy can be made on an ***unformatted disk*** every 45 seconds! The lightning read, write, format, and verify routines that were developed make this program much quicker that RSDOS or OS-9 for backups. This will become one of your most used programs!

## ·NEW· NEW·

**Only $19.95 each. 3 for $39.95.**

**SPECIAL With our 512K Upgrade (Next page) only $2. each or 3 for $5!**

Announcing:

The finest graphics/drawing program for the COCO 3!

## Da Vinci 3

- 16 colors on screen at one time
- Modify each color from 64 available colors
- Use composite or RGB monitor
- Draw with custom paintbrushes
- Full resolution 320 X 192
- Picture converter for conversion of COCO 2 pictures to COCO 3
- Multiple text fonts
- Accepts input from joystick, X-pad, mouse, or touch-pad
- Boxes, circles, line, paint generation
- Screen dump for Tandy mono and color ink-jet printers, (NX-10 and others pending)
- Sensible price
- No additional hardware required because of course/fine joystick movement modes
- Zoom mode for individual pixel editing
- Great on screen menu which is removable at the touch of a key to allow full screen edit

128K or 512K COCO 3 $37.95

## Super I/O Board for OS-9

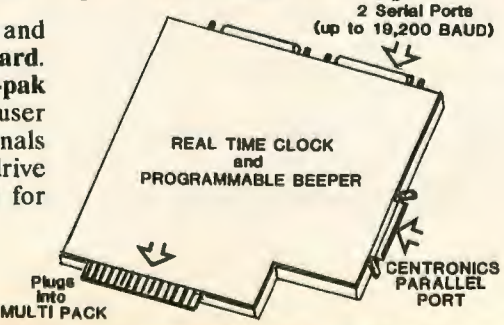
**Each Board Provides 2 Serial Ports and Centronics Parallel Port**

**First Board has Real Time Clock and Beeper... With Second Board up to 5 Users**

The serial ports are usable **up to 19,200 Baud**, and the parallel port is a **true Centronics standard**. Plug into your multi-pak. **On CoCo 3, multi-pak must be upgraded.** You will have a multi-user system with additional computers or terminals plugged into the serial ports. An OWL hard drive and 512K upgrade are strongly recommended for multi-user systems.

***Intro Price...*** **$169.**

**BOARD 2... $145.**



More Ads...

**OWL-WARE**

P.O. Box 116-A
Mertztown, PA 19539
— ORDER LINES (only) —
(800) 245-6228
(215) 682-6855 (PA)

# Proven

## On the Razor's Edge of

# Basic and OS-9 Hard Drive Systems

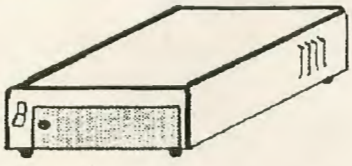
### Proven Performance for Demanding Home or Business Users

Every hard drive which has been produced by OWL-WARE during the last 3 years is **complete**. A system consists of software, hard drive, controller, heavy-duty power supply, and LR Tech Interface. There are no hidden costs for assembly or testing. When a drive system is ordered, we fully **assemble**, **test**, and **burn-in** the system for 3 full days. This ensures dependability and optimum performance.

We have now been supplying CoCo hard drive systems and parts for more than 3 years. This is the longest history in the CoCo market of any system. Some other advertisers are stating that they have one of the most reliable systems for the CoCo *with all of 4 months history in the CoCo hard drive market*! We have reached our position in the hard drive market by providing our customers with a quality product that they (and we) can be proud to own and use.

Because of many requests for a lower price system in kit form, we are now selling a kit of all parts at a significant discount compared to our regular prices. We recommend this kit (or any kits offered by any other supplier) only to those who have experience in electronic assembly and OS-9.

**For OS-9 Levels 1 and 2**



| 10 Meg. | 20 Meg. | 40 Meg. | 80 Meg. (2 X 40 Meg.) |
|---|---|---|---|
| **System Prices:** (Includes Hard Drive, Controller, LR Tech Interface, Software. Fully assembled and tested.) | | | |
| **$469.** | **$599.** | **$725.** | **$1,069.** |
| **Kit Prices:** (LR Tech System as above but not assembled or tested.) | | | |
| **$419.** | **$549.** | **$659.** | **$ 999.** |
| **Kit Prices:** (As above but using Burke & Burke bus adapter) | | | |
| ***(na)*** | **$489.** | **$609.** (lower prices) | |
| **30 Meg Kit:** | **$539.** (Lowest prices anywhere) | | |

### OWL Hard Drive BASIC 3

There have been several ads in this magazine about BASIC for Color Computer hard drive systems. These ads sometimes only tell a part of the story. Our BASIC system price includes **assembly**, **testing**, and **3-day burn-in** period. We do not require a Multi-pak to operate.

Our hard drive systems are fast, reliable, and reasonable in price. This has been proven by hundreds of users over the past 3 years. We do not have to turn off error checking for speed. We achieve high speed BASIC from a unique indexing method.

The table below will summarize some of the key points about our BASIC hard drive system and two other systems. We believe that we have the best BASIC interface for CoCo hard drives available.

**BASIC Hard Drive Systems***

| Feature | OWL | B&B | RGB |
|---|---|---|---|
| Drive Portion Available | Entire | Entire(?) | Entire |
| User Sets BASIC/OS-9 Partitions | YES | Yes | No |
| Add to Existing OS-9 Drive Without Reformat | YES | Yes(?) | No |
| Drives 0-3 Hard/Floppy | YES | No | Yes |
| Built in Park | YES | No | Yes |
| Speed* | FAST | Fast | Fast |

*All feature details are believed to be true at time of writing and are subject to change. We believe that our BASIC hard drives are the fastest due to our indexing method, but all three systems are fast. On ours all BASIC commands work including DSKINI, DSKI$, and DSKO$.

**Prices: With/Without Hard Drive**

**$35./$79.**

# Technology

## the Color Computer Frontier

# DISK DRIVES

## Floppy Drive Systems

**The Highest Quality for Service Now and for Years to Come**

**Use our WHISPER DRIVE for the finest, quietist drive**

**Drive 0 Systems** (Half Height, Double Sided, Direct Drives) **$219.**

**Drive 0 systems complete with drive, controller, legal DOS, cable, case, power supply, and manual**

**Drive 1 Systems** (Half Height, Double Sided, Direct Drives) **$129.**

**New 3.5", 720K Drives for OS-9** with case & Power Supply **$179.**

**Drive 1 Systems have drive, case, power supply. (You may require optional cable and/or DOS chip to use)**

**Special for 0/1 Combos (Drives 0,1,2,3) $315.**

### HALF- HEIGHT DRIVE UPGRADES FOR RS HORIZONTAL CASES

Why only double the capacity of your system when you can triple in the same case? Kit includes: double-sided to fit your case, chip to run both sides of new drive, hardware, and detailed instructions. Easy! Takes only 5 minutes!

**Model 500 $119.** **Model 501 or 502 $129.**

All drives are new and fully assembled. We ship only FULLY TESTED and CERTIFIED at these low prices. We use Fuji, YE Data, and other fine brands. No drives are used or surplus unless otherwise stated to you when you order. We appear to be the one of the few advertisers in Rainbow who can truly make this claim. We have 5 years experience in the CoCo disk drive market! We are able to provide support when you have a problem.

**Drives 1 Year Warranty**

## OWL Phones

**Order Numbers (only)**

**1-800-245-6228**

**1-215-682-6855**

**Technical Help**

**1-215-837-1917**

### OWL WARE Software Bundle

**Disk Tutorial/Utilities/Games**

**DISK TUTOR Ver 1.1**

Learn how to use your disk drive from this multi-lesson, machine language program. This tutor takes you through your lessons and corrects your mistakes for a quick, painless disk drive introduction. (This professionally written tutor is easily worth the bundle's total price.)

**OWL DOS**

An operating system that gives faster disk access and allows the use of double-sided drives. Corrects a floating point number error on early CoCo systems.

**COPY-IT**

Quickly copies selected programs between disks. A wild card option selects groups of programs to copy.

**VERIFY**

Verifies reading of each sector. Bad sectors are listed on the screen.

**2 GAMES**

We will select 2 games from our stock. These sold for more than $20 each.

If sold separately this is more than $125 worth of software!!

Do not mistake this software with cheap, non-professional "Public Domain" software which is being offered by others. All of this software is copyrighted and professional in quality. The tutor is unique with us and has helped thousands of new users learn their disk drive.

**only $27.95**
**(or even better)**
**only $6.95 with**
**any Disk Drive Purchase!!**

Our prices include a discount for cash but do not include shipping.

OWL-WARE has a liberal warranty policy. During the warranty period, all defective items will be repaired or replaced at our option at no cost to the buyer except for shipping costs. Call our tech number for return. Return of non-defective or unauthorized returns are subject to a service charge.

**OWL-WARE**
**P.O. BOX 116**
**Mertztown, PA 19539**

```
9Ø ELSE RETURN
23ØØ '
231Ø '****** U.S.MAP ******
232Ø '
233Ø PMODE3,1:PCLS5:SCREEN1,1:CO
LOR3,1
234Ø LINE(Ø,Ø)-(255,191),PSET,B
235Ø LINE(1Ø,1Ø)-(245,181),PSET,
B
236Ø DRAW"BM11Ø,16Ø;D15F2R8E2U15
"
237Ø LINE(1Ø6,156)-(15Ø,179),PSE
T,B
238Ø DRAW"BM134,16Ø;BR1ØBD2H2L8G
2D4F2R8F2D4G2L8H2"
239Ø LINE(36,2Ø)-(36,22),PSET
24ØØ IF MP=2 THEN PUT(3Ø,2Ø)-(22
Ø,135),M:GOTO 289Ø
241Ø DATA6,34,22,36,34,36,41,33,
47,32,64,35,75
242Ø GOSUB 296Ø:DRAW"R2D2L2"
243Ø DATA7,41,89,45,9Ø,54,1Ø1,54
,1Ø3,64,1Ø3,77,1Ø7,87,1Ø7
244Ø GOSUB296Ø:DRAW"U1R5"
245Ø DATA42,97,112,97,115,1Ø3,11
7,1Ø4,115,1Ø9,116,116,125,124,12
8,124,122,126,118,129,122,13Ø,11
5,139,115,141,117,148,117
246Ø DATA 145,113,156,112,16Ø,11
4,163,112,167,118,167,121,171,12
7,171,129,173,131,178,129,178,12
1,177,116,172,1Ø7,175,1Ø2,178,1Ø
1,179,98,191,85,189,75,193,77,19
4,75,194,72,197,72,2ØØ,65,198,64
,199,61,197,59,2Ø7,56,212,53
247Ø GOSUB 296Ø:DRAW"U2R2D1":LIN
E-(215,51),PSET:DRAW"U2L2U1L2U6"
248Ø DATA12,22Ø,4Ø,221,35,218,34
,218,26,215,27,21Ø,25,2Ø7,35,2Ø4
,36,192,36,181,43,178,43,174,47
249Ø GOSUB 296Ø:DRAW"R2D2L2"
25ØØ DATA2,163,54,168,43,2,169,3
4,159,32,4,147,22,142,25,126,2Ø,
36,2Ø,36,34,39,35
251Ø GOSUB 296Ø:DRAW"U3R2D2R2U2"
:GOSUB296Ø:DRAW"U7L4U2":GOSUB296
Ø:GOSUB3Ø3Ø:DRAW"U2"
252Ø DATA2,48,36,57,36,57,2Ø,57,
44,3,55,46,58,47,58,53
253Ø GOSUB296Ø:GOSUB3Ø3Ø:GOSUB29
6Ø
254Ø DATA2,32,54,75,54,49,54,49,
72,4,65,87,67,9Ø,64,93,64,1Ø3
255Ø GOSUB3ØØØ:GOSUB296Ø
256Ø DATA68,54,68,84,2,67,37,69,
44,6,75,42,97,42,76,6Ø,1Ø5,6Ø,84
,6Ø,84,1Ø7,68,81,127,81,1Ø5,6Ø,1
Ø5,81,1Ø2,81,1Ø2,1Ø4
257Ø GOSUB3Ø3Ø:DRAW"L3D3":DRAW"B
M62,2Ø;D8R2D8":GOSUB296Ø:DRAW"R7
U2D18R21U4Ø":GOSUB3ØØØ
258Ø DATA2,92,1Ø4,92,1Ø6,1Ø2,84,
112,84,4,112,93,119,96,131,96,13
3,115,119,2Ø,119,26
259Ø GOSUB296Ø:GOSUB3Ø3Ø:GOSUB29
6Ø
26ØØ DRAW"BM127,81;D2R2D14":GOSU
B3Ø3Ø
261Ø DATA3,121,29,118,37,97,37,1
18,37,121,4Ø,5,121,54,118,53,117
,54,115,53,97,53,121,53,123,56,4
,122,62,125,66,127,69,127,81
262Ø GOSUB296Ø:GOSUB3Ø3Ø:GOSUB29
6Ø:GOSUB3Ø3Ø:GOSUB296Ø
263Ø DATA2,1Ø5,66,125,66,143,25,
136,32,3,134,4Ø,137,51,148,51,2,
121,48,135,48,138,51,141,57,2,13
7,65,124,65,149,51,15Ø,53
264Ø GOSUB3ØØØ:DRAW"D2L2":GOSUB2
96Ø:DRAW"D1R2":GOSUB3ØØØ:GOSUB29
6Ø:GOSUB3Ø3Ø
265Ø DATA5,151,56,151,7Ø,149,73,
145,75,143,78,137,65,145,81,142,
84,137,97,137,97,139,1ØØ,4,138,1
Ø3,14Ø,1Ø8,144,1Ø8,145,113,2,139
,9Ø,168,9Ø,149,9Ø,148,112,158,9Ø
266Ø GOSUB296Ø:GOSUB3Ø3Ø:DRAW"D3
L3U2L14":GOSUB3Ø3Ø:DRAW"D1L6":GO
SUB3Ø3Ø:GOSUB296Ø:GOSUB3ØØØ:DRAW
"R4U4R8":GOSUB299Ø:DRAW"DM159,1Ø
9;R9U1R4"
267Ø PAINT(128,56),2,1
268Ø DATA173,1Ø4,168,93,169,89,1
8Ø,9Ø,183,93,158,9Ø,16Ø,87,2,163
,87,168,82,149,73,15Ø,74,4,153,7
2,154,72,16Ø,69,16Ø,54,16Ø,67,16
1,69,1Ø,162,68,165,7Ø,17Ø,78,173
,78,174,74,177,73,178,72,181,71,
187,72,189,77
269Ø GOSUB3Ø3Ø:DRAW"D1L2":GOSUB2
99Ø:DRAW"R5D1R6":GOSUB3Ø3Ø
27ØØ DRAW"BM144,83;R4U1R41"
271Ø GOSUB3Ø3Ø:GOSUB296Ø:GOSUB3Ø
3Ø
272Ø GOSUB296Ø:GOSUB3Ø3Ø:GOSUB29
6Ø
273Ø DATA2,163,81,168,78,136,31,
14Ø,3Ø,6,144,34,146,34,148,4Ø,15
1,38,149,44,148,51,142,31,15Ø,27
,7,149,3Ø,152,31,156,29,159,33,1
55,34,15Ø,35,149,39,159,33,155,3
7,3,153,43,153,47,15Ø,53,157,35,
161,37
274Ø GOSUB3ØØØ:GOSUB296Ø:GOSUB3Ø
3Ø
275Ø GOSUB296Ø:GOSUB3Ø3Ø:GOSUB29
6Ø:GOSUB3Ø3Ø
276Ø DRAW"D7R2U3"
```

```
277Ø DATA2,165,42,166,47,15Ø,54,
169,54,4,176,5Ø,176,47,183,44,18
4,42,172,52,172,68,3,191,68,194,
69,194,72,172,64,169,67,164,7Ø,1
93,58,192,58,191,63,2,193,64,191
,68,197,51,2Ø9,51,21Ø,54
278Ø GOSUB296Ø:GOSUB3Ø3Ø:GOSUB29
6Ø:GOSUB3Ø3Ø:GOSUB296Ø
279Ø DRAW"BM189,68;D3R6"
28ØØ GOSUB3Ø3Ø:GOSUB299Ø
281Ø DRAW"BM175,68;D4R5"
282Ø DRAW"BM175,51;D4R13"
283Ø GOSUB299Ø:DRAW"R4U9R2U12"
284Ø GOSUB3Ø3Ø:GOSUB296Ø:GOSUB3Ø
3Ø:GOSUB299Ø:GOSUB3ØØØ:GOSUB299Ø
285Ø DATA2,2Ø5,51,2Ø5,57,199,46,
2Ø7,47,21Ø,44,2Ø4,36,2Ø5,39,2,2Ø
3,43,2Ø3,47,2Ø9,32,2Ø8,35,2,2Ø9,
43,21Ø,43,2Ø2,6Ø,2Ø9,58,3,21Ø,6Ø
,2Ø6,61,2Ø2,6Ø
286Ø GOSUB 3Ø3Ø:GOSUB296Ø:GOSUB3
Ø3Ø:GOSUB296Ø
287Ø DRAW"BM189,69;C5D2R3":DRAW"
BM19Ø,69;C3D3R2"
288Ø IF MP<>2 THEN GET(3Ø,2Ø)-(2
2Ø,135),M:MP=2
289Ø DRAW"BM21Ø,8Ø;U6R6D6L6BR12U
6R4D6U3L4BR9BD3U6BR4G3F3"
29ØØ DRAW"BM21Ø,9Ø;U6R6D6L6BR12U
6D3R5U3D6BR6U6"
291Ø DRAW"BM21Ø,1ØØ;U6R6D6L6BR12
U6R3F1D4G1L3BR9U6R3F1BD4G1L3"
292Ø RETURN
293Ø '
294Ø '** READ MAP ONCE ONLY **
295Ø '
296Ø READA
297Ø FORX=1 TO A:READ B,C
298Ø LINE-(B,C),PSET:NEXTX:RETUR
N
299Ø READA,B:LINE-(A,B),PSET:RET
URN
3ØØØ READA
3Ø1Ø FOR X=1 TO A:READB,C,D,E
3Ø2Ø LINE(B,C)-(D,E),PSET:NEXTX:
RETURN
3Ø3Ø READA,B,C,D:LINE(A,B)-(C,D)
,PSET:RETURN
3Ø4Ø '
3Ø5Ø '** SCREEN CLEANUP **
3Ø6Ø '
3Ø7Ø FOR WIPE=128 TO 416 STEP 32
:PRINT@WIPE,STRING$(32," ");:NEX
T:RETURN
4ØØØ CLS:PRINT STRING$(32,175):P
RINT"LOAD OR SAVE DATA FILES..."
:PRINT STRING$(32,159)
4ØØ2 PRINT"CHOOSE 1>CASSETTE 2>D
ISK ":INPUT CD$
4ØØ4 PRINT"DATA FILES WILL INCLU
DE VOTES & PREDICTIONS."
4ØØ6 PRINT:PRINT"CHOOSE 1> SAVE
OR 2> LOAD":INPUT SL$
4ØØ8 IF SL$="1" THEN 4Ø12
4ØØ9 IF SL$="2" THEN 4Ø2Ø
4Ø1Ø SOUND 1,1:PRINT"CHOOSE 1 OR
 2!":FOR DL=1 TO 46Ø:NEXT:GOTO 4
ØØØ
4Ø12 IF CD$="2"THEN 4Ø16
4Ø13 OPEN "O",#-1,"ELECT.DAT"
4Ø14 FOR X=1 TO 51:WRITE #-1,SV(
X),PP(X):NEXT X:CLOSE #-1
4Ø15 RETURN
4Ø16 OPEN "O",1,"ELECT.DAT"
4Ø17 FOR X=1 TO 51:WRITE #1,SV(X
),PP(X):NEXT X:CLOSE 1
4Ø18 RETURN
4Ø2Ø IF CD$="2" THEN 4Ø26
4Ø21 OPEN "I",#-1,"ELECT.DAT"
4Ø22 FOR X=1 TO 51:INPUT #-1,SV(
X),PP(X):NEXT X:CLOSE #-1
4Ø23 RETURN
4Ø26 OPEN "I",1,"ELECT.DAT"
4Ø27 FOR X=1 TO 51:INPUT #1,SV(X
),PP(X):NEXT X:CLOSE 1
4Ø28 RETURN
45ØØ CLS:PRINT STRING$(32,175):P
RINT"POLITICAL PREDICTION.....":
PRINT STRING$(32,159);
45Ø2 PRINT"YOUR CHANCE TO OUT-EX
PERT THE   EXPERTS. ENTER YOUR P
REDICTION  AS TO HOW EACH STATE
WILL VOTE.";
45Ø4 PRINT" ELECTION 88 WILL COM
PARE YOUR   PREDICTIONS WITH THE
 ACTUAL VOTEAS IT IS ENTERED.":P
RINT
45Ø6 PRINT"<PRESS ANY KEY TO CON
TINUE>"
45Ø8 AK$=INKEY$:IF AK$=""THEN 45
Ø8 ELSE GOSUB 3Ø7Ø
45Ø9 FOR X=1 TO 51
451Ø PRINT@128,"ENTER YOUR PREDI
CTION FOR":PRINT "THE STATE OF "
;LS$(X):PRINT
4512 PRINT"<D>EMOCRAT OR <R>EPUB
LICAN"
4514 PRINT"<X> FOR MENU   ";:INP
UT CH$
4515 IF CH$="X"THEN 453Ø
4516 IF CH$="D" THEN PP(X)=1:GOT
O 452Ø
4517 IF CH$="R" THEN PP(X)=2:GOT
O 452Ø
4518 PP(X)=Ø
452Ø GOSUB 3Ø7Ø:NEXT X
453Ø RETURN
```

# NOVICES NICHE

## We're Looking for a Few Good Shorties

Help! The Niche needs more submissions! If you have written a good shortie, please send it in. We're looking for graphics, utilities, educational programs and games (especially games!). How short is a shortie? Well, if you printed out your listing in 32 columns, as we do, it should fit on one half of an 8½-by-11 inch page (be under 12 inches). (Entering `PRINT#-2,CHR$(27)CHR$(81)CHR$(32)` will allow most Epson-compatible printers to `LLIST` a program in 32 columns if you want to check this.)

# Utilities

## Free Zone

64K ECB

### By Ric Pucella

*Scroll Protect* is a utility employing a machine language subroutine to protect an area of the screen from scrolling; the area can be affected only by the `PRINT @` command. *Scroll Protect* can be incorporated into another utility or a game, as long as the "parent" program works in the text screen.

When run, the program puts the CoCo in the 64K all-RAM mode (ROM instructions are copied into RAM, where they can be modified). It asks you for the top and bottom line of the "new" screen. These two values (from 0 to 15) will be the new borders of the screen, and anything above or below them lies in the protected zone, unaffected by the scroll. To restore the screen to its original size, press the reset button or run the program again.

**The listing:** NOSCROLL

```
1Ø '*** SCROLL PROTECT
2Ø '*** BY RIC PUCELLA
25 CLEAR &HFF,&H7FØØ
3Ø DATA 26,8Ø,142,128,Ø,166,132,
183,255,223,167,128,14Ø,224,Ø,39
,5,183,255,222,32,239,28,175,57
4Ø FOR A=3Ø72 TO 3Ø96:READB:POKE
A,B:NEXTA:EXEC3Ø72
5Ø FORX=&H7FØØ TO &H7F1D:READB$:
B=VAL("&H"+B$):POKE X,B:NEXTX
6Ø DATA BD,B3,E4,83,Ø1,FF,1Ø,22,
35,4Ø,C3,Ø5,FF,34,1Ø,9E,88,BF,7F
,FE,35,1Ø,DD,88,86,63,B7,7F,FD,3
9
7Ø FORX=&H7FAØ TO &H7FB8:READB$:
B=VAL("&H"+B$):POKE X,B:NEXTX
8Ø DATA B6,7F,FD,81,63,27,Ø5,86,
ØD,7E,B9,B1,BE,7F,FE,9F,88,7F,7F
,FD,86,ØD,7E,B9,B1
9Ø CLS:PRINT"LINES FROM Ø TO 15"
1ØØ PRINT@128,"TOP LINE:";:LINEI
NPUT TP$
11Ø TP=VAL(TP$)
12Ø IFTP<Ø OR TP>15 THEN 1ØØ
13Ø PRINT@128,"BOTTOM LINE:";:LI
NEINPUT BT$
14Ø BT=VAL(BT$)
15Ø IF BT<Ø OR BT>15 OR BT<=TP+1
 THEN 13Ø
16Ø TP=(TP*32+1Ø24)
17Ø T1=INT(TP/256):T2=TP-(T1*256
)
18Ø BT=(BT*32+1Ø24)
19Ø B1=INT(BT/256):B2=BT-(B1*256
)
2ØØ CLSØ
21Ø POKE &HA347,B1
22Ø POKE &HA348,B2+31
23Ø POKE &HA34C,T1
24Ø POKE &HA34D,T2
25Ø POKE &HA92B,T1
26Ø POKE &HA92C,T2
27Ø POKE &HA932,B1
28Ø POKE &HA933,B2+31
32Ø PR=BT-TP
34Ø PR=PR+TP
35Ø P1=INT(PR/256):P2=PR-(P1*256
)
36Ø POKE &HA354,P1
37Ø POKE &HA355,P2
42Ø POKE &HB9Ø3,&H7F
43Ø POKE &HB9Ø4,&HØØ
431 POKE &HB958,&H7E
432 POKE &HB959,&H7F
433 POKE &HB95A,&HAØ
44Ø CLS
```

# I/O in the Fast Lane

64K DISK

## By Joel Hegberg

Thumbing through the June '88 issue of RAINBOW, I came across Scott Honaker's article "Exercise Your Drives" (Page 110). It showed how to really speed up the CoCo's disk drives, but it didn't show how to use that speed for everyday operations. After a careful reading of the article, I loaded *EDTASM+*, started nosing my way through Disk BASIC and found the places that use the disk drives. I made a machine language program and, after days of trial and error, created *Fast Disk*.

The program first does a ROM-RAM conversion on the CoCo 1 and 2. Then it stores the ML program into memory and runs it. The program actually changes the drive step rate from a slow 30 milliseconds to a fast six milliseconds. It also reduces the wait period CoCo takes before reading the disk. Every time I use my CoCo 2, I run this program first.

I tested my efforts by timing how long it took to load *EDTASM+* before and after *Fast Disk*; it took 12 seconds before and only eight seconds after. *Fast Disk* also makes the drive quieter and stops the rattling that worries so many new users.

Just type in, save and run the program. *Fast Disk* requires no other programs to help it along, and it should be compatible with most of your BASIC programs. If you press the reset button, however, the system will revert to Disk BASIC. To prevent this, either make a reset patch or simply type POKE 65503,0 at the OK prompt, to be back in *Fast Disk*.

**The listing:** FASTDISK

```
Ø 'FAST-DISK
1 '
2 'BY JOEL MATHEW HEGBERG
3 '936 NORTH TWELFTH STREET
4 'DE KALB, ILLINOIS  6Ø115
5 '
6 CLEAR5ØØØ:PCLEAR8:CLS:IFPEEK(3
3Ø21)=5ØTHEN7:ELSE1Ø
7 GOSUB12
8 CLS:PRINT"FAST-DISK IS INSTALL
ED."
9 END
1Ø RESTORE:FORT=4ØØØTO4Ø22:READA
:POKET,A:NEXTT:EXEC4ØØØ:GOTO7
11 DATA 26,8Ø,16,142,128,Ø,127,2
55,222,166,164,127,255,223,167,1
6Ø,16,14Ø,255,Ø,37,24Ø,57,-4
12 READA:IFA<>-4THEN12:ELSEP=573
44
13 READA:IFA=-1THEN14:ELSEPOKEP,
A:P=P+1:GOTO13
14 EXEC57344:RETURN
15 DATA 126,224,6,126,224,33,142
,224,3,166,128,183,215
16 DATA 1Ø1,236,132,253,215,1Ø2,
127,215,192,134,2Ø5,183
17 DATA 215,224,134,2Ø,183,216,2
2,57,127,9,133,15Ø,234
18 DATA 129,2,38,5,134,41,183,9,
134,126,215,1Ø4,Ø,-1
```

# Graphics

# Showing Off Random Graphics

CoCo 3

## By Allen Goff

*Loader* and *Ellipse* are two complementary programs that let CoCo 3 users create a series of random graphics and store them for later recall. *Ellipse* allows the user some control over the final appearance of a graphic, and then saves that graphic (in binary format) to disk — it can save as many graphics as the disk will hold (about 20, as each "picture" takes up three granules of disk space).

When run, *Ellipse* prompts the user for the number of designs to save to disk and then calls on random horizontal and vertical values to draw a design of interlocking ellipses across and down the screen. Pressing the up arrow key begins the process anew, overlaying the first design with a different one. The pattern can become as complex as the user wishes. Pressing the right arrow key saves the graphic in its current stage of development. Pressing the space bar clears the screen. The program will continue generating ellipses until it has saved to disk the specified number of graphics.

When you have finished with graphics creation, load *Loader*, insert the "save" disk into the drive, and run. The program will ask you for the number of graphics to display and then proceed to display them in an automatic "slide-show." Although the pictures were drawn in PMODE 4, the program gives you the option of viewing them in PMODE 3.

**Listing 1:** LOADER

```
1Ø CLS
2Ø PRINT"     ******************
***     "
3Ø PRINT"     *  LOADER PROGRAM
  *     "
4Ø PRINT"     * PRESS 3 FOR MODE
3 *     "
5Ø PRINT"     * PRESS 4 FOR MODE
4 *     "
6Ø PRINT"     ******************
***
7Ø Z$=INKEY$:IF Z$=""THEN 7Ø ELS
E IF Z$="3" THEN P=3 ELSE IF Z$=
"4" THEN P=4 ELSE IF Z$<>"3" OR
Z$<>"4"THEN 7Ø
8Ø INPUT"  ENTER NO.GRAPHICS TO
LOAD";N
9Ø IF N=Ø THEN 8Ø
1ØØ FOR A=1 TO N
11Ø PMODE P,1:PCLS 1:SCREEN 1,1
12Ø LOADM(STR$(A))
13Ø FOR T=1 TO 1ØØØ:NEXT T
14Ø NEXT A
15Ø PCLS 1
16Ø RUN
17Ø END
18Ø GOTO 18Ø
```

**Listing 2:** ELLIPSE

```
1Ø CLS
2Ø PRINT" ***********************
*******"
3Ø PRINT" *  ELIPSE TO SAVE GRAP
HICS  *"
4Ø PRINT" * PRESS ANY KEY TO CON
TINUE *"
5Ø PRINT" ***********************
*******"
6Ø INPUT"  ENTER NO.GRAPHICS TO
SAVE";N
7Ø IF N=Ø THEN 6Ø
8Ø FOR A=1 TO N
9Ø WIDTH 32:PALETTE CMP
1ØØ PMODE 4,1
11Ø PCLS 1
12Ø SCREEN 1,1
13Ø R=25
14Ø C=6
15Ø I=.25*RND(1Ø)
16Ø FOR Y=1 TO 191 STEP 27.142
17Ø FOR X=Ø TO 255 STEP 17.ØØ
18Ø CIRCLE(X,Y),R,C,I,Ø,.5
19Ø CIRCLE(X,Y),R,C,I,.5,Ø
2ØØ NEXT X,Y
21Ø R=R+1:IF R>5Ø THEN R=25
22Ø Z$=INKEY$:IF Z$=""THEN 22Ø E
LSE IF Z$="^"THEN 24Ø ELSE IF Z$
=CHR$(9)THEN 25Ø ELSE IF Z$<>" "
AND Z$<>"^"AND Z$<>CHR$(9)THEN 2
2Ø ELSE 23Ø
23Ø PCLS:GOTO 15Ø
24Ø PMODE 4,1:C=8:GOTO 15Ø
25Ø SAVEM(STR$(A)),3584,9727,358
4
26Ø NEXT A
27Ø GOTO 27Ø
28Ø END
```

## Game

# It's a Bug-Eat-Bug World

CoCo 3

### By Stephen Elms

In *Centipede* you become a big insect with a voracious appetite for little insects. As the little mites pop up on the screen you use your arrow keys to race over and gulp them up. The only problem is that each bug you eat makes you grow (Mother Centipede always told you that eating your insects would make you grow big and strong). As your body grows longer and longer, it becomes more and more difficult to negotiate the little rectangle in life you've been allotted. Beware of running into your tail or bumping into a wall, for to do so is to court peril! Remember this one commandment and you will live to eat many bugs.

**The listing:** CENTPEDE

```
5 CLEAR
7 BUG$="S3;U3L2H2F2D3L2R2D3G2E2R
2U3R5L3D3F2H2U6E2"
3Ø HSCREEN 2
35 HCOLOR 1Ø
4Ø HPRINT(16,1Ø),"CENTIPEDE"
5Ø HPRINT(19,12),"BY"
6Ø HPRINT(14,14),"STEPHEN ELMS"
7Ø FOR X=1 TO 25ØØ:NEXT
8Ø DIM EL(8ØØ,1)
9Ø HSCREEN 2
1ØØ HCIRCLE(5,5),3,3
1Ø5 HPAINT(5,5),3,3
1Ø9 ON ERR GOTO 12Ø
11Ø HBUFF 1,1ØØ
115 HBUFF 2,1ØØ
12Ø HGET(Ø,Ø)-(1Ø,1Ø),1
125 HGET(1Ø,1Ø)-(2Ø,2Ø),2
13Ø HSCREEN 2
14Ø HCOLOR7:HLINE(1Ø,1Ø)-(31Ø,18
Ø),PSET,B:HPAINT(5,2),7,7
15Ø X=13Ø:Y=9Ø:L=1:N=1:C=1:MO=1
16Ø EL(N,Ø)=X:EL(N,1)=Y
17Ø N=N+1:IF N=8Ø1 THEN N=1
18Ø P=HPOINT(X,Y)
19Ø IF P<>Ø AND P<>1Ø THEN 49Ø
2ØØ IF P=1Ø THEN XC=1:LL=LL+5:C=
C+1Ø:SOUND45,1
21Ø GOSUB 38Ø
22Ø HPUT(X-5,Y-5)-(X+5,Y+5),1,PS
ET
23Ø IF C=Ø THEN HPUT (EL(L,Ø)-5,
EL(L,1)-5)-(EL(L,Ø)+5,EL(L,1)+5)
,2,PSET
24Ø IF C=Ø THEN L=L+1
25Ø IF L=8Ø1 THEN L=1
26Ø IF C>Ø THEN C=C-1
27Ø K$=INKEY$
28Ø IF K$="" THEN 33Ø
29Ø IF K$=CHR$(94) THEN MO=1
3ØØ IF K$=CHR$(9) THEN MO=2
31Ø IF K$=CHR$(1Ø) THEN MO=3
32Ø IF K$=CHR$(8) THEN MO=4
33Ø IF MO=1 THEN Y=Y-1Ø
34Ø IF MO=2 THEN X=X+1Ø
35Ø IF MO=3 THEN Y=Y+1Ø
36Ø IF MO=4 THEN X=X-1Ø
37Ø GOTO 16Ø
38Ø IF XC>1 THEN XC=XC-1:GOTO 48
Ø
39Ø IF XC=1 THEN HDRAW"BM"+X$+",
"+Y$+";C Ø;"+BUG$
```

```
4ØØ XC=Ø
41Ø RR=RND(1Ø)
42Ø IF RR<>6 THEN 48Ø
43Ø XX=(RND(25)*1Ø)+3Ø
44Ø YY=(RND(15)*1Ø)+2Ø
45Ø IF HPOINT(XX,YY)<>Ø THEN 43Ø
46Ø X$=STR$(XX):Y$=STR$(YY):HDRA
W"BM"+X$+","+Y$+";C1Ø;"+BUG$
47Ø XC=5Ø
48Ø RETURN
49Ø HCOLOR 1Ø
5ØØ HPRINT(16,1Ø),"SCORE "
5Ø5 HPRINT(17,12),LL
51Ø HPRINT(14,14),"PLAY AGAIN"
52Ø FOR DLAY=1 TO 2ØØØ:NEXT
53Ø K$=INKEY$:IF K$="" THEN 53Ø
54Ø IF K$="Y" THEN CLS:RUN
55Ø IF K$="N" THEN END ELSE 53Ø
```

# Education

## Odd One Out

16K ECB

### By Ken Ostrer

If your children are unsure of, or just a little fuzzy on, which numbers are even and which are odd, *Even-Odd* may be of help. When you run the program, a small tutorial is presented, and then the student is drilled on the subject.

A line of numbers is displayed, and the student must press E or O depending on whether the number is even or odd. A bar at the bottom of the screen represents how much time is left for each set. If time runs out before the responses are complete, the drill will end. Speed and accuracy are of the utmost importance.

Six sets of numbers are presented per screen "page." To make things more interesting, the child must get at least 75 percent of the responses correct in order to advance to the next page. The child will probably get more out of this program if the parent and child solve the problems together.

**The listing:** EVENODD

```
1Ø CLEAR5ØØ:CLS:PRINT"EVEN ODD T
UTORIAL":PRINT:PRINT"NUMBERS THA
T END IN Ø, 2, 4, 6  OR 8 ARE ev
en NUMBERS."
2Ø PRINT:PRINT"NUMBERS THAT END
IN 1, 3, 5, 7  OR 9 ARE odd NUMB
ERS."
3Ø PRINT:PRINT"HERE ARE SOME EXA
MPLES OF EVEN  AND ODD NUMBERS:"
:PRINT"EVEN: 2, 4, 1Ø, 1Ø2, 2Ø6,
 3Ø4,  12ØØ, 5498, 12984, 5ØØØØ,
 183484"
4Ø PRINT"ODD: 1, 7, 19, 31, 99,
187, 3Ø3,1Ø97, 2555, 9999, 2Ø1Ø7
, 8Ø3345":FORX=1344TO15Ø3:IFPEEK
(X)>9ØTHENPOKEX,PEEK(X)-64ELSEPO
KEX,PEEK(X)-64
5Ø NEXT:PRINT"PRESS ANY KEY FOR
DRILL SECTION";:K$=INKEY$
6Ø IFINKEY$=""THEN6Ø
7Ø CLS:PRINT"EVEN ODD DRILLER":Z
=96:T=Ø:C=Ø:N=Ø:TT=Ø:X=RND(-TIME
R)
8Ø PRINT@449,"YOUR SCORE IS:"SC:
PRINT@481,"% RIGHT THIS PAGE:"Ø;
9Ø PRINT@19,"P:"PA+1:N=N+1:PRINT
@Z+1,CHR$(96+N);:FORX=1TORND(5)+
5:A$=A$+CHR$(RND(9)+48):NEXTX:PR
INT@Z-27,A$:PRINT@Z+5,STRING$(LE
N(A$),141);:PRINT@417,STRING$(3Ø
,128);
1ØØ K$=INKEY$:IFK$<>"O"ANDK$<>"E
"THENT=T+.1:PRINT@448-T," ";:IFP
EEK(1441)=96THENPLAY"T1ØO1FGGGGF
FEAGGGG":PRINT@32,"TIME'S UP!";:
FORM=ØTO75Ø:NEXTM:GOTO19ØELSE1ØØ
11Ø TT=TT+1:PRINT@Z+37+E,K$;
12Ø P=VAL(MID$(A$,E+1,1))
13Ø IFP/2=INT(P/2)THENIFK$="E"TH
ENSC=SC+P*1Ø:C=C+1:PLAY"T75O5AEE
EA":GOTO15Ø
14Ø IFP/2<>INT(P/2)THENIFK$="O"T
HENSC=SC+P*1Ø:C=C+1:PLAY"T75O5AE
EEA"
15Ø PRINT@448,STRING$(63,32);:PR
INT@449,"YOUR SCORE IS:"SC:PRINT
@481,"% RIGHT THIS PAGE:"C/TT*1Ø
Ø;
16Ø E=E+1:IFE<LEN(A$)THEN1ØØ
17Ø T=Ø:E=Ø:A$="":Z=Z+128:IFN=6T
HENIFC/TT>=.75THENPLAY"T5O5FBBCC
DCA":PRINT@32,"NEXT PAGE...";:FO
RM=ØTO15ØØ:NEXTM:PA=PA+1:GOTO7ØE
LSEPRINT@32,"SORRY, YOU DIDN'T G
ET 75% RIGHT.";:FORM=ØTO15ØØ:NEX
TM:GOTO19ØELSEIFN/3=INT(N/3)THEN
Z=112
18Ø GOTO9Ø
19Ø PRINT@32,"DO YOU WISH TO TRY
 AGAIN?        ";:K$=INKEY$
2ØØ K$=INKEY$:IFK$="Y"THENRUN7ØE
LSEIFK$<>"N"THEN2ØØELSECLS:END
```

**Submissions to "Novices Niche" are welcome from everyone. We like to run a variety of short programs that can be typed in at one sitting and are useful, educational and fun. Keep in mind, although the short programs are limited in scope, many novice programmers find it enjoyable and quite educational to improve the software written by others.**

**Program submissions must be on tape or disk. We're sorry, but we cannot key in program listings. All programs should be supported by some editorial commentary, explaining how the program works. If your submission is accepted for publication, the payment rate will be established and agreed upon prior to publication.**

# TANDY ADD-ONS

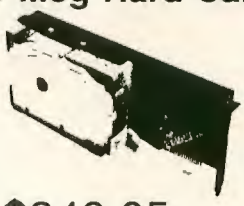
For Tandy 1000, SX, TX

## 10 Meg Hard Card

$299.95

1000, SX, TX

## 20 Meg Hard Card



$349.95

1000, SX, TX

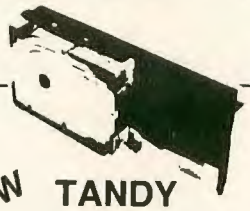
## 30 Meg Hard Card

$399.95

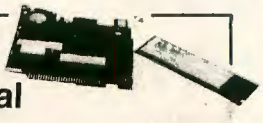
1000, SX, TX

## 40 Meg Hard Card

$459.95



NEW **TANDY**
1000, SX, TX
49 Meg Hard Card
32 MS (speed)
**$599.95**



**NEW Cardinal Modems**
2400 Baud 300/1200/2400
**(Hayes Compatible)**
Complete with software manuals
ONLY **$149.95**

# TANDY 1000

1000, SX, TX, 3000, 4000

## Hard Drive Kits

| | |
|---|---|
| 10 Meg | $279.95 |
| 20 Meg | $339.95 |
| 30 Meg | $379.95 |
| 40 Meg | $499.95 |

## 2nd Floppy

| | | |
|---|---|---|
| 360K | TEAC | $119.95 |
| 720K | Mitsubishi | $99.95 |
| 3½" | Mitsubishi | $119.95 |

1000, 1000A, SX, TX

## Hard Drive Controller

Will run 1 or 2
Hard Drives
Supports drives up to 120 megabytes

**$99.95**

## Memory Cards

Zucker Memory

- DMA & 512K — CALL

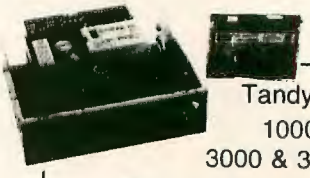
Zucker Multifunction

- Serial
- Real Time Clock
- 512K DMA
- Software

CALL

## Tandy 1400 LT Laptop

| | |
|---|---|
| 360K External Floppy | $199.95 |
| 20 Meg Internal Hard Disk | $859.95 |



Tandy 1000, 1000SX, 3000 & 3000HL

## Tape Backup

| | |
|---|---|
| 20, 30, 40 Meg Tape Backup | $399.95 |
| 60 Meg Tape Backup Archive | $659.95 |

QUALITY
CUSTOMER SERVICE
508-278-6555

TECHNICAL ASSISTANCE
508-278-6556

*TRUE DATA PRODUCTS*
115 So Main Street
Uxbridge, MA 01569
**Tel. 508-278-6555**
**1-800-635-0300**
Hours: 9 a.m.-6 p.m., Sat. 10 a.m.-4 p.m.

Look for our other ads throughout this issue

CORPORATE P.O.'S WELCOMED

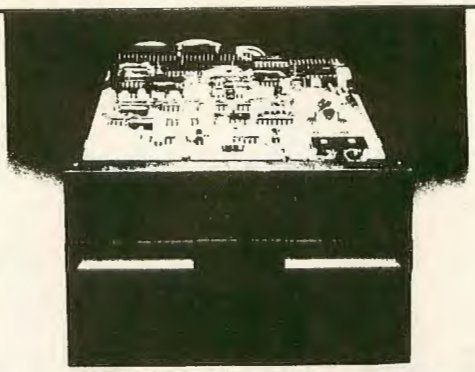
ALL PACKAGES SHIPPED UPS
EXCEPT CANADA AND A.P.O.'s
C.O.D.'S ADD $2.30
MASTER CHARGE/VISA ADD 3%
1 YEAR WARRANTY UNLESS
OTHERWISE NOTED
PRICES TERMS CONDITIONS
SUBJECT TO CHANGE WITHOUT
NOTICE

# NEW DISK DRIVES

Starting at

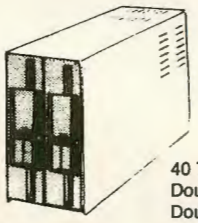
**89.95**

with case & Power Supply 129.95



**TANDON MPI TEAC**
Speed 6ms tk to tk and up
Capacity 250k unformatted
Tracks 40
Warranty *now 1 Year*

*New Low Price!*



40 Tks 6Ms
Double Sided
Double Density

40 or 80 Tracks
½ Hght. Teac/Panasonic

**1 YEAR Warranty!**

**SATISFACTION GUARANTEED!!**
ALL DRIVES FULLY TESTED AND WARRANTEED

We carry only the finest quality disk drives
*no seconds • no surplus*

## Free Software for Drive 0 Systems

**CoCo Checker...Test roms, rams, disk drives and & controller printer, keyboard cassette & more.**
**Tape/Disk Utility...Transfers disk to tape and tape to disk.**

**169.95** Drive 0
- Full Ht Drive
- Single Case
- Heavy Duty Power Supply
- 2 Drive Cable
- Gold plated contacts
- Controller & manuals

**189.95** Drive 0
- Double Sided Slim Line Drive
- Case holds 2 slim line drives
- Heavy Duty Power Supply
- 2 Drive Cable
- Gold plated contacts
- Controller & Manuals

**289.95** Drive 0 & 1
- 2 Double Sided Slim Line Drive
- Case holds 2 slim line drives
- Heavy Duty Power Supply
- 2 Drive Cable
- Gold plated contacts
- Controller & Manuals

## *Other Drive Specials*

Drives cleaned, aligned & tested, **29.95**

**119.95**
2nd Drive
for new Radio Shack
includes:
- Slim Line DS/DD Drive
- Cabling & Instructions
- Mounting Hardware

| | |
|---|---|
| Full Ht Drive | 89.95 |
| Full Ht Drive Ps/Case | 129.95 |
| Slim Line Drive | 99.95 |
| Slim Line Drive Ps/Case | 139.95 |
| 2 Slim Drives Ps/Case | 239.95 |
| Disk Controller | 59.95 |

| | |
|---|---|
| Single Ps & Case | 44.95 |
| Dual ½ht Ps & Case | 54.95 |
| Dual Full Ht. Ps & Case | 79.95 |
| Disk Controller | 59.95 |
| 10 Diskettes with free library case | 9.95 |

*Dealer Inquiries Invited*

617-278-6555

We welcome
- Visa/Mastercard
- Checks (allow 2 weeks for clearing)
- C.O.D. Add $2.

*TRUE DATA PRODUCTS*

9 South Main Street
Uxbridge, MA 01569
**617-278-6555**
Hours: Mon.-Sat., 9-6 (EST)

***Call us today!* 617-278-6555**
**Order Toll Free 1-800-635-0300**

*The fifth in a series of tutorials for the beginner to intermediate machine language programmer*

# Machine Language Made BASIC Part V: Get the Point

## By William P. Nee

This month's programs change the color of various screen locations. Now, color information is stored in several locations in the Color Computer. Locations used in this article are as follows:

| Location | | Start-up |
|---|---|---|
| $B2 | foreground color | (3) |
| $B3 | background color | (0) |
| $B4 | current color | (0) |
| $B5 | $B4x(#$55) | (0) |
| $C2 | PSET = 1; PRESET = 0 | |

As shown in Figure 1, colors depend on the PMODE and color set used.

The computer colors zero to three correspond to the BASIC colors one to four and five to eight. Three is the highest number used for color because 4x(#$55) would be greater than 255 and would not fit into Location $B5. With machine language, we can control and change the contents of the color locations throughout the program.

At start-up, the computer will store 0 in $B3 (for the background color) and 3 in $B2 (for the foreground color). *Using the PCLS* routine at $9542 will clear the screen to the background color. If you want a different background color, either load the desired color number into $B3 and JSR 9542, or load the desired color number into Register B and JSR $9536. (The latter will *not* change the background color in $B3.)

Location $C2 can be used as a toggle for PSET (if it is set to one) or to PRESET (if it is set to zero). However, the PSET routine we will use starts after the ROM routine has checked Location $C2, so we should use either the subroutine at $959A, which multiplies the color number by #$55 and stores this total at Location $B5, or PMODE 4/2/0, which will store a random 0 or -1 (RND(2)-2) in $B5 and then PSET or PRESET the point. (Remember, -1 is the same number as #$FF.) PMODE 3/1 will use a random (0 - 3)x(#$55) to PSET three colors or PRESET the background color.

**Figure 1:**

| | Number | Set 0 | Set 1 | $B5 |
|---|---|---|---|---|
| PMODE 3/1 | 0 | green | buff | #$00 |
| | 1 | yellow | cyan | #$55 |
| | 2 | blue | magenta | #$AA |
| | 3 | red | orange | #$FF |
| PMODE 4/2/0 | 0 | black | black | #$00 |
| | 3 | green | buff | #$FF |

You may also use the PPOINT routine at $933C to check the color of a bit at any horizontal location (by storing that bit in Location $BE) and any vertical location (by storing it in $C0). The result of the PPOINT routine is stored in FP1. JSR $B3ED will return the color number to Register B. In PMODE 3/1 the result will be colors one to four (if you are using color set to 0), or colors five to eight (if you are using color set to 1). In PMODE 4/2/0, the result will be zero or one with color set to 0, and zero or five with color set to 1. Your program may have different branches if Register B was equal/not equal to one of these colors. If a point has been PRESET, the PPOINT routine will make it the background color. (Note: You always lose registers A, B, and X, so be sure to save them first.)

The PSET routine is at Address $9374, and, as with most machine language programs, requires some additional set-up. The routine uses the following locations:

| | |
|---|---|
| $B9 | bytes per line |
| $BD/BE | horizontal coordinate — X1 |
| $BF/C0 | vertical coordinate — Y1 |

The coordinate locations are two bytes so that you could, for example, either STX $BD or STA $BE. X1 cannot be greater than 255; Y1 cannot be greater than 191; and neither can be less than zero.

A *scaling* routine at $931D is also required. Since we will pick up the PSET routine after ROM has scaled the coordinates, we must add this to our program prior to the PSET. Scaling adjusts X1 and Y1 to compensate for the different bytes per line (in $B9) assigned to the individual PMODES. Without this scaling routine, most graphic commands (PSET, LINE, CIRCLE, etc.) would be accurate only in PMODE 4. (The PPOINT routine we've already discussed includes the scaling subroutine.)

---

*Bill Nee bucked the "snowbird" trend by retiring to Wisconsin from a banking career in Florida. He spends the long, cold winters writing programs for his CoCo.*

**Listing 1:** POINTBAS

```
1Ø PMODE 4,1:PCLS:SCREEN 1,1
2Ø FOR N=Ø TO 32
3Ø FOR NN=31 TO N STEP -1
4Ø B=RND(2)
5Ø FOR H=Ø TO 192 STEP 64
6Ø FOR V=Ø TO 128 STEP 64
7Ø ON B GOSUB 1ØØ,15Ø
8Ø NEXT V,H,NN,N
9Ø GOTO 2Ø
1ØØ PSET(H+NN,V+NN-N):PSET(H+NN-
N,V+NN)
11Ø PSET(H+62-NN,V+NN-N):PSET(H+
62-NN+N,V+NN)
12Ø PSET(H+62-NN,V+62-NN+N):PSET
(H+62-NN+N,V+62-NN)
13Ø PSET(H+NN,V+62-NN+N):PSET(H+
NN-N,V+62-NN)
14Ø RETURN
15Ø PRESET(H+NN,V+NN-N):PRESET(H
+NN-N,V+NN)
16Ø PRESET(H+62-NN,V+NN-N):PRESE
T(H+62-NN+N,V+NN)
17Ø PRESET(H+62-NN,V+62-NN+N):PR
ESET(H+62-NN+N,V+62-NN)
18Ø PRESET(H+NN,V+62-NN+N):PRESE
T(H+NN-N,V+62-NN)
19Ø RETURN
```

The PSET routine in ROM uses registers A and B, so be sure to save any information in them first. Before running the program, set Location $FF/100 to #$2000. Since the program starts with PMODE, type "GPMODE" or "G3000" to execute it. Pressing any key will break the program, but you must hold the key down for several seconds because the program does a lot before getting to the *break* location. In the 'A' mode you can read the program and symbols from $2200 to $2B65.

Run the BASIC program first to get a feel for the design and program speed (or lack of it). Next, run the machine language program. (Note: The machine language program does *not* run on the CoCo 3.) If you run the machine language program from BASIC, clear enough memory with the command, CLEAR 200, &H3000-1. Even though the machine language program is eight times longer, it runs much more quickly.

*(Questions or comments concerning this tutorial may be addressed to the author at Route 2, Box 216C, Mason, WI 54856-9302. Please enclose an SASE when requesting a reply.)* □

**Listing 2:** POINTBIN

```
                    ØØØ5Ø *  $FF/1ØØ=#$2ØØØ
3ØØØ                ØØ1ØØ           ORG     $3ØØØ
          9374      ØØ11Ø PSET      EQU     $9374
          ØØBE      ØØ12Ø X1        EQU     $BE
          ØØCØ      ØØ13Ø Y1        EQU     $CØ
```


*Alpha Software Technologies*

OS9 Level II BBS Release 2

The best BBS system has just gotten better! System comes complete and ready to run in less than 5 minutes! Use the built in menus or create your own, you can even run your own programs or games on-line! Complete message system allows easy message posting and retrieving. Complete file transfer system supports Xmodem and Ymodem as well as keyword searching, single line, and paragraph file descriptions. System runs completely in the background, allowing you full use of your computer!
512k OS9 Level II Required.....$29.95

The Zapper

This wonderful utility allows you to patch anything! Patch commands directly on the disk and fix CRC's automatically! Even allows you to patch the OS9Boot file without making a new boot disk! Save files that have been lost or deleted! Fix crashed disks! Hundreds of uses!
64k OS9 Level I or II Required.....$19.95

Disk Manager Tree

This versatile utility will make your OS9 life a breeze! No more will you have to fight with complicated directory structures. No more searching for files and typing long path names. All of this is displayed with windows. A tree window allows you to change, create, and delete directories quickly. A files window allows you to copy, view and delete files easily. Perfect for the OS9 beginner! Multi-View compatibility makes it perfect for Multi-View users!
512k OS9 Level II Required.....$29.95

OS9 Toolkit

Finally OS9 life becomes easy! With these great utilities you'll be using OS9 like a pro! Complete wildcard commands make file manipulation simple and easy! Tree commands make directory manipulation a breeze! The many other utilities make OS9 much easier to use! 16 utilities in all! At $19.95 that's less than $1.25 a utility!
OS9 64k Level I or II Required.....$19.95

Level II Tools

Level II tools includes all tools in the level I toolkit, plus 9 great level II utilities! Utilities include commands for changing colors, creating overlay windows complete with borders, browsing through files, and more! At 24.95 it's less than $1.00 per utility!
128k OS9 Level II Required.....$24.95

Warp!

Finally, a complete OS9 level II terminal program that you can afford! Program features Auto-dial, Auto-macro, File transfers, buffer capture, on-line timer, and much much more! Level II windows make it super simple to use! All you'll ever need in a terminal program! Comes complete with ICONS for Multi-View compatability!
512k OS9 Level II Required.....$34.95

Multi-Menu

Easily create your own pop-down menus with this great utility! No programming experience neccessary! With this great utility you can run any OS9 command or program from a menu. Menu creation is super-easy and super-simple! Actually create the menu from the menu! A must for any Multi-View user!
512k OS9 Level II and Multi-View Required.....$19.95

Please add $3.00 for shipping and handling.
C.O.D. orders please add an additional $2.00 C.O.D. charge

Send check or money order to:Alpha Software Technologies
2810 Buffon St.
Chalmette, La. 70043
C.O.D. orders call: (601) 266-2773



**Burke & Burke**

P.O. Box 1283 Palatine, IL 60078-1283
(312) 397-2898

RAINBOW CERTIFICATION SEAL

# Real BASIC for OS9!

Only $39.95

OS-9 LEVEL TWO VR.
COPYRIGHT 1986 BY
MICROWARE SYSTEMS CORP.
LICENSED TO TANDY CORP.
ALL RIGHTS RESERVED

July 11, 1988 14:37:30

Shell

OS9: xmode /w5 type=0
OS9: init /w5
OS9: rsh <>>>/w5 &
&007

CLEAR

COPR. 1988 BURKE & BURKE
DISK EXTENDED COLOR BASIC 2.1
COPR. 1982, 1986 BY TANDY
UNDER LICENSE FROM MICROSOFT
AND MICROWARE SYSTEMS CORP.

OK
LOAD "DEMO"
OK
LIST
10 PMODE 4:SCREEN 1,1
20 X=RND(256)-1:Y=RND(192)-1
30 A=RND(256-X)-1:B=RND(192-Y)-1
40 LINE (X,Y)-(X+A,Y+B),PSET,BF

***There is nothing wrong with your Color Computer. Do not attempt to adjust it.***

**Burke & Burke's new R.S.B. program gives you a complete, OS9-compatible version of Disk Extended Color BASIC. We've added new software for OS9-style graphics, sound, printer, and disk I/O. The BASIC you know and love is now running under Level 2 OS9 windows!**

**R.S.B. loads and saves files using OS9's file format, so we've also included utilities to transfer BASIC programs and data files between OS9 and BASIC disks. Of course, you can't use R.S.B. to run machine language programs, and some BASIC commands work slightly differently under R.S.B.**

**Your BASIC programs can take full advantage of great OS9 features like hard disks, no-halt floppies, multi-tasking, and 2 MHz operation.**

**R.S.B. requires a CoCo 3 with at least 128K RAM, a floppy controller with either Tandy Disk Extended Color BASIC or DISTO CoCo 3 CDOS ROM, and Level 2 OS9.**

R.S.B. $39.95

ILLINOIS RESIDENTS PLEASE ADD 7% SALES TAX. COD's add $2.20. Shipping (within the USA) $1.50. Please allow 2 weeks for delivery. Overnight delivery available for in-stock items. We accept MasterCard and VISA. Telephone orders accepted (312) 397-2898.

# Submitting Material To Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs that are useful/helpful/fun for other CoCo owners.

**WHAT TO WRITE:** We are interested in what you may wish to tell our readers. We accept for consideration anything that is well-written and has a practical application for the Tandy Color Computer. If it interests you, it will probably interest lots of others. However, we vastly prefer articles with accompanying programs which can be entered and run. The more unique the idea, the more the appeal. We have a continuing need for short articles with short listings. These are especially appealing to our many beginners.

**FORMAT:** Program submissions must be on tape or disk, and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs and debug our typing errors. All programs should be supported by some editorial commentary explaining how the program works. We also prefer that editorial copy be included on the tape or disk using any of the word processors currently available for the Color Computer. Also, please include a double-spaced printout of your editorial material and program listing. Do not send text in all capital letters; use upper- and lowercase.

**COMPENSATION:** We do pay for submissions, based on a number of criteria. Those wishing remuneration should so *state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a self-addressed, stamped envelope (SASE) to: Submission Guidelines, THE RAINBOW, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. We will send you comprehensive guidelines.

Please do not submit material *currently submitted* to another publication.

```
                BF1F    ØØ14Ø RND      EQU     $BF1F
3ØØØ C6         Ø4      ØØ15Ø PMODE    LDB     #4
3ØØ2 BD         9628    ØØ16Ø          JSR     $9628
3ØØ5 C6         Ø1      ØØ17Ø          LDB     #1       PAGE 1
3ØØ7 BD         9653    ØØ18Ø          JSR     $9653
3ØØA BD         9542    ØØ19Ø          JSR     $9542    PCLS
3ØØD C6         Ø1      ØØ2ØØ          LDB     #1       GRAPHICS SCREEN
3ØØF BD         95AA    ØØ21Ø          JSR     $95AA
3Ø12 C6         Ø1      ØØ22Ø          LDB     #1       COLOR SET 1
3Ø14 BD         9682    ØØ23Ø          JSR     $9682
3Ø17 4F                 ØØ24Ø START    CLRA
3Ø18 B7         3187    ØØ25Ø LOOP1    STA     N
3Ø1B C6         1F      ØØ26Ø          LDB     #31
3Ø1D F7         3188    ØØ27Ø LOOP2    STB     NN
3Ø2Ø C6         Ø2      ØØ28Ø RANDOM   LDB     #2
3Ø22 BD         BC7C    ØØ29Ø          JSR     $BC7C    REGISTER B TO FP1
3Ø25 BD         BF1F    ØØ3ØØ          JSR     RND      GET RANDOM(2)
3Ø28 BD         B3ED    ØØ31Ø          JSR     $B3ED    FP1 TO REGISTER D
3Ø2B 83         ØØØ2    ØØ32Ø          SUBD    #2       GET -1 OR Ø
3Ø2E D7         B5      ØØ33Ø          STB     $B5      -1=#$FF=PSET; Ø=PRESET
3Ø3Ø B6         3188    ØØ34Ø Q1       LDA     NN       POINT 1
3Ø33 B7         3189    ØØ35Ø          STA     XX
3Ø36 B6         3188    ØØ36Ø          LDA     NN
3Ø39 BØ         3187    ØØ37Ø          SUBA    N
3Ø3C B7         318A    ØØ38Ø          STA     YY
3Ø3F 17         ØØBØ    ØØ39Ø          LBSR    SHOW1
3Ø42 B6         3188    ØØ4ØØ QQ1      LDA     NN       POINT 2
3Ø45 BØ         3187    ØØ41Ø          SUBA    N
3Ø48 B7         3189    ØØ42Ø          STA     XX
3Ø4B F6         3188    ØØ43Ø          LDB     NN
3Ø4E F7         318A    ØØ44Ø          STB     YY
3Ø51 17         ØØ9E    ØØ45Ø          LBSR    SHOW1
3Ø54 86         3E      ØØ46Ø Q2       LDA     #62      POINT 3
3Ø56 BØ         3188    ØØ47Ø          SUBA    NN
3Ø59 B7         3189    ØØ48Ø          STA     XX
3Ø5C B6         3188    ØØ49Ø          LDA     NN
3Ø5F BØ         3187    ØØ5ØØ          SUBA    N
3Ø62 B7         318A    ØØ51Ø          STA     YY
3Ø65 17         ØØ8A    ØØ52Ø          LBSR    SHOW1
3Ø68 86         3E      ØØ53Ø QQ2      LDA     #62      POINT 4
3Ø6A BØ         3188    ØØ54Ø          SUBA    NN
3Ø6D BB         3187    ØØ55Ø          ADDA    N
3Ø7Ø B7         3189    ØØ56Ø          STA     XX
3Ø73 F6         3188    ØØ57Ø          LDB     NN
3Ø76 F7         318A    ØØ58Ø          STB     YY
3Ø79 17         ØØ76    ØØ59Ø          LBSR    SHOW1
3Ø7C 86         3E      ØØ6ØØ Q3       LDA     #62      POINT 5
3Ø7E BØ         3188    ØØ61Ø          SUBA    NN
3Ø81 B7         3189    ØØ62Ø          STA     XX
3Ø84 86         3E      ØØ63Ø          LDA     #62
3Ø86 BØ         3188    ØØ64Ø          SUBA    NN
3Ø89 BB         3187    ØØ65Ø          ADDA    N
3Ø8C B7         318A    ØØ66Ø          STA     YY
3Ø8F 17         ØØ6Ø    ØØ67Ø          LBSR    SHOW1
3Ø92 86         3E      ØØ68Ø QQ3      LDA     #62      POINT 6
3Ø94 BØ         3188    ØØ69Ø          SUBA    NN
3Ø97 BB         3187    ØØ7ØØ          ADDA    N
3Ø9A B7         3189    ØØ71Ø          STA     XX
3Ø9D 86         3E      ØØ72Ø          LDA     #62
3Ø9F BØ         3188    ØØ73Ø          SUBA    NN
3ØA2 B7         318A    ØØ74Ø          STA     YY
3ØA5 17         ØØ4A    ØØ75Ø          LBSR    SHOW1
3ØA8 F6         3188    ØØ76Ø Q4       LDB     NN       POINT 7
3ØAB F7         3189    ØØ77Ø          STB     XX
3ØAE 86         3E      ØØ78Ø          LDA     #62
3ØBØ BØ         3188    ØØ79Ø          SUBA    NN
3ØB3 BB         3187    ØØ8ØØ          ADDA    N
3ØB6 B7         318A    ØØ81Ø          STA     YY
3ØB9 17         ØØ36    ØØ82Ø          LBSR    SHOW1
3ØBC B6         3188    ØØ83Ø QQ4      LDA     NN       POINT 8
3ØBF BØ         3187    ØØ84Ø          SUBA    N
3ØC2 B7         3189    ØØ85Ø          STA     XX
3ØC5 86         3E      ØØ86Ø          LDA     #62
3ØC7 BØ         3188    ØØ87Ø          SUBA    NN
3ØCA B7         318A    ØØ88Ø          STA     YY
3ØCD 17         ØØ22    ØØ89Ø          LBSR    SHOW1
3ØDØ F6         3188    ØØ9ØØ FINISH   LDB     NN
```

```
3ØD3 5A          ØØ91Ø          DECB
3ØD4 F1   3187   ØØ92Ø          CMPB    N
3ØD7 1Ø2C FF42   ØØ93Ø          LBGE    LOOP2
3ØDB B6   3187   ØØ94Ø          LDA     N
3ØDE 4C          ØØ95Ø          INCA
3ØDF 81   2Ø     ØØ96Ø          CMPA    #32
3ØE1 1Ø25 FF33   ØØ97Ø          LBLO    LOOP1
3ØE5 AD   9F AØØØ ØØ98Ø          JSR     [$AØØØ] ANY INPUT?
3ØE9 1Ø27 FF2A   ØØ99Ø          LBEQ    START
3ØED 5F          Ø1ØØØ          CLRB            SET FOR TEXT SCREEN
3ØEE BD   95AA   Ø1Ø1Ø          JSR     $95AA
3ØF1 3F          Ø1Ø2Ø          SWI             RTS IF IN BASIC
3ØF2 FC   3189   Ø1Ø3Ø SHOW1    LDD     XX      SQUARE 1
3ØF5 97   BE     Ø1Ø4Ø          STA     X1
3ØF7 D7   CØ     Ø1Ø5Ø          STB     Y1
3ØF9 BD   9374   Ø1Ø6Ø          JSR     PSET
3ØFC FC   3189   Ø1Ø7Ø SHOW2    LDD     XX      SQUARE 2
3ØFF 8B   4Ø     Ø1Ø8Ø          ADDA    #$4Ø
31Ø1 97   BE     Ø1Ø9Ø          STA     X1
31Ø3 D7   CØ     Ø11ØØ          STB     Y1
31Ø5 BD   9374   Ø111Ø          JSR     PSET
31Ø8 FC   3189   Ø112Ø SHOW3    LDD     XX      SQUARE 3
31ØB 8B   8Ø     Ø113Ø          ADDA    #$8Ø
31ØD 97   BE     Ø114Ø          STA     X1
31ØF D7   CØ     Ø115Ø          STB     Y1
3111 BD   9374   Ø116Ø          JSR     PSET
3114 FC   3189   Ø117Ø SHOW4    LDD     XX      SQUARE 4
3117 8B   CØ     Ø118Ø          ADDA    #$CØ
3119 97   BE     Ø119Ø          STA     X1
311B D7   CØ     Ø12ØØ          STB     Y1
311D BD   9374   Ø121Ø          JSR     PSET
312Ø FC   3189   Ø122Ø SHOW5    LDD     XX      SQUARE 5
3123 CB   4Ø     Ø123Ø          ADDB    #$4Ø
3125 97   BE     Ø124Ø          STA     X1
3127 D7   CØ     Ø125Ø          STB     Y1
3129 BD   9374   Ø126Ø          JSR     PSET
312C FC   3189   Ø127Ø SHOW6    LDD     XX      SQUARE 6
312F C3   4Ø4Ø   Ø128Ø          ADDD    #$4Ø4Ø
3132 97   BE     Ø129Ø          STA     X1
3134 D7   CØ     Ø13ØØ          STB     Y1
3136 BD   9374   Ø131Ø          JSR     PSET
3139 FC   3189   Ø132Ø SHOW7    LDD     XX      SQUARE 7
313C C3   8Ø4Ø   Ø133Ø          ADDD    #$8Ø4Ø
313F 97   BE     Ø134Ø          STA     X1
3141 D7   CØ     Ø135Ø          STB     Y1
3143 BD   9374   Ø136Ø          JSR     PSET
3146 FC   3189   Ø137Ø SHOW8    LDD     XX      SQUARE 8
3149 C3   CØ4Ø   Ø138Ø          ADDD    #$CØ4Ø
314C 97   BE     Ø139Ø          STA     X1
314E D7   CØ     Ø14ØØ          STB     Y1
315Ø BD   9374   Ø141Ø          JSR     PSET
3153 FC   3189   Ø142Ø SHOW9    LDD     XX      SQUARE 9
3156 CB   8Ø     Ø143Ø          ADDB    #$8Ø
3158 97   BE     Ø144Ø          STA     X1
315A D7   CØ     Ø145Ø          STB     Y1
315C BD   9374   Ø146Ø          JSR     PSET
315F FC   3189   Ø147Ø SHOW1Ø   LDD     XX      SQUARE 1Ø
3162 C3   4Ø8Ø   Ø148Ø          ADDD    #$4Ø8Ø
3165 97   BE     Ø149Ø          STA     X1
3167 D7   CØ     Ø15ØØ          STB     Y1
3169 BD   9374   Ø151Ø          JSR     PSET
316C FC   3189   Ø152Ø SHOW11   LDD     XX      SQUARE 11
316F C3   8Ø8Ø   Ø153Ø          ADDD    #$8Ø8Ø
3172 97   BE     Ø154Ø          STA     X1
3174 D7   CØ     Ø155Ø          STB     Y1
3176 BD   9374   Ø156Ø          JSR     PSET
3179 FC   3189   Ø157Ø SHOW12   LDD     XX      SQUARE 12
317C C3   CØ8Ø   Ø158Ø          ADDD    #$CØ8Ø
317F 97   BE     Ø159Ø          STA     X1
3181 D7   CØ     Ø16ØØ          STB     Y1
3183 BD   9374   Ø161Ø          JSR     PSET
3186 39          Ø162Ø          RTS
3187             Ø163Ø N        RMB     1
3188             Ø164Ø NN       RMB     1
3189             Ø165Ø XX       RMB     1
318A             Ø166Ø YY       RMB     1
         3ØØØ    Ø167Ø          END     PMODE
```

*Hint . . .*

### Cursor Controls

Memory location 63372 controls the blink rate of the cursor on the CoCo 3's 40- and 80-column text screens. Simply poke this location with any value from 0 to 255 to change the rate. The default value is 11. Lower values increase the blink rate while larger values make the cursor blink slower. If you want to stop the Hi-Res cursor from blinking altogether, enter POKE63381,0. To restart the blinking, enter POKE 63381,1.

*Ken Ostrer*
*Vancouver, Washington*

*Hint . . .*

### HPRINT Shortened

When entering BASIC programs, I like to use the shorthand version of the PRINT command (typing a question mark instead of typing out PRINT). Unfortunately, if you try entering H? on the CoCo 3 (instead of HPRINT), you will get a syntax error upon running the program. To solve this problem, enter the entire listing using H?. Then save the listing in ASCII format and reload it. All H? commands will be changed to HPRINT.

*Carl England*
*Calhoun, Georgia*

*Hint . . .*

### BASICally a Setup

In order to make using my CoCo a little easier, I saved a program on my utilities disk that sets the printer baud rate, drive selection and other parameters. To make things even simpler, I named the program *.BAS. Now when I want to start working, I just enter RUN"* and let the computer set itself up, much in the way an AUTOEXEC file works on MS-DOS systems.

*Harold Grumann*
*Atlanta, Georgia*

*Smooth out those rough spots with a little help from CoCo*

# What's the Angle?

**By Joseph Kolar**
**Rainbow Contributing Editor**

Using the motion option of the CoCo's DRAW command, we have created some simple line drawings. Let us now soften the traditionally sharp edges of CoCo graphics by adding gentle curves to our creation.

For this demonstration, we will make a simple footprint — specifically the print of a man's right shoe. We will start with a rough sketch on graph paper. After we get a shape that pleases us, we will use our modified *Graph Paper* program to put the sketch on the CoCo screen.

Begin by choosing the dimensions of the shoe print. (For this demonstration, I chose 8-by-20 units.) Next, take a sheet of graph paper and outline an oblong that is eight boxes wide and 20 boxes long. Use a mark at the top of the oblong to divide the figure into two equal parts. Mark the oblong at two-block intervals along the left vertical line. For our purposes, the upper left-hand corner of this figure will be our point of origin (0,0). The tip of the shoe should be two units wide and centered.

As you sketch, you are also plotting your program line. First, move three units to the right and then make a two-unit pencil mark to the right (BR3R2). Move in a 135-degree angle for one unit (F). Our sketch widens gradually and should touch the right border of our oblong at the coordinates (8,9). If you draw a line to continue in this direction, you would have a sharp angle two units to the right and three units down, which translates to M+2,8 or M+2,+8.

Next, make your sketch curve toward the center by using a line that moves six units down and two units to the left (M-2,6). Now we need to add a heel to this figure. To be in proportion with the rest of the shoe, the heel should be four units long. Because we have five units to fill, start by moving down one unit. Now we will create the front of the heel. In order to be centered, the heel's line should be four units long (NL4). Next, move down three units (D3), and round the butt of the heel by by moving one unit at a 225-degree angle (G) and two units to the left.

(Are you sketching as we go? You should have one half of a shoe on your graph paper.)

*Florida-based Joseph Kolar is a veteran writer and programmer who specializes in introducing beginners to the powers of the Color Computer.*

To make the other side of the heel, move one unit at a 315-degree angle and four units up (HU4). We must now show an indentation for the instep. To do this, move in an angle that is four units up and one unit to the right (M+1,-4). Now widen the shoe until it touches the left boundary of your oblong by drawing a line that is four units up and three units to the left (M-3,-4).

As we return to the tip of the shoe, we must draw a line that moves in a 45-degree angle (E) and reaches the top boundary of our oblong at the coordinates (2,1). This will leave a gap that we can connect with a line six units up and two units to the right (M+2,-6).

This outline *should* look like a right shoe. Go over the outline in red ink, moving from point to point. Now, let's see what this looks like on the CoCo screen.

Load our *Graph Paper* program (September 1988, Page 80), and add the following line:

```
300 GOTO 300
```

We will need all 19 rows created on the screen and will need to modify the utility in the following manner:

Line 30: change 160 to 190 in both C$ and D$ strings.
Line 50: concatenate +A$+B$+A$.
Line 60: change 160 to 190 at all four occurrences.
Line 70: change C4 to C2, and change 160 to 190 in both occurrences.

Never hesitate to tailor an existing program to fit a new situation. In this tutorial, we need three more rows, and we want to change the border color to make our outline stand out. In a later, tutorial, we will create a full 256-by-192 screen.

You may want to make the following changes to our graph-paper utility: Add the contents of Line 90 to the end of Line 80, and separate with a colon. Put Line 90 in limbo with a REM. Now run the utility. If the program runs properly, delete Line 90.

(While we're modifying our utility, let me offer the solution to the last column's problem: Change all the 1s to 2s in lines 150 to 157.)

Back to the drawing board. *We* have a problem. We can only create 19 boxes in a vertical direction, but our shoe is 20 boxes long. How can we create our drawing on the screen? We could shorten the shoe length one unit. Where can we remove one unit on each side of the shoe? I suggest that we begin at Location (6,15) and remove one unit down. Run a zigzag pencil line over the red line one unit above the heel. On the other side of the shoe, make a zigzag line over its mate. These zigzag lines indicate that you must omit the marked segments when you are creating the program line. Now the shoe is 8-by-19 units.

Enter Line 95, which will remove all the unnecessary portions of the graph paper from the screen. This way, you can concentrate on converting your sketch into a shoe on the screen.

Using our shoe print we will begin creating the outline on the CoCo screen by typing the following line:

```
100 DRAW "C3S40BM0,0BR3R2F"
```

Then press ENTER and type RUN.

Next, press BREAK and type EDIT100. Press ENTER and X to move to the end of the line. Use the left arrow to move one space and remove the closing quote marks in Line 100. Type in M+2,BM-2,6", press ENTER and run. If your screen does not duplicate your sketch, look for an error in either the direction or the number of units. Now press BREAK.

Look at the sketch. We have reached the unit that we plan to omit. Edit Line 100, removing the closing quote as we did before. Now we need to move four units to the left and return to the move's

starting point (NL4). Next, we need to finish the heel D3GL2HU3). To do this, add the following to Line 100:

```
NL4D3GL2HU3"
```

Now press ENTER and run the program.

Complete the shoe by editing Line 100, removing the closing quotes and concluding the DRAW statement. Make sure that your statement omits the unit corresponding to the one we removed in our drawing. When you have finished, type RUN.

If your footprint is faulty, don't panic. Just refer to your sketch and correct your program line accordingly.

Look over your creation. Would you like to see it in a usable size (like Size 8)? If so, just type in the following lines:

```
98 GOTO 400
400 PMODE4,1:PCLS:SCREEN1,0
410 GOTO 100
```

Edit Line 100 to change S40 to S8. To do this, type EDIT100, and press ENTER. Use the space bar to move under the 4, press D (to delete 4) and C8 (to change the 0 to an 8). Now press ENTER to get out of the editing mode, and run the program.

Both sides of the sole come to a sharp point. We want gentler curves than this. Let's make a few modifications to our sketch. (After all, have you ever seen a drawing or a program you couldn't improve?)

First, let's return our shoe print to the graph-paper screen by masking Line 98 with REM and editing Line 100 by typing EDIT100 and pressing ENTER, moving the cursor under 8 and typing C4I0 to change 8 to 4 and insert 0. Now press ENTER and run the program.

(You may wish to study the points that are earmarked for modification.)

Begin at (6,0) and sketch a line that moves down six units and right two units, then moves down two more units. This changes M+2,8 to M+2,6D2. With a black pen, mark over the newly created pencil line.

***"We will make a simple footprint starting with a rough sketch on graph paper, then using our modified* Graph Paper *program to put the sketch on the CoCo screen."***

At Point (3,11), we will make a line that moves for three units in a 315-degree angle, and moves up one unit. Pencil it in. That changes M-3,-4 to H3U. Ink over the pencil line in black.

At this time, we have to modify Line 100 to incorporate these changes. If you look at your sketch, you will see that we need to modify the red portions of the sketch to the coordinates indicated by the black lines on the sketch. Note that the first change begins after F in Line 100.

Type EDIT100 and press ENTER. Use the space bar to move the cursor under 8. Type C6ID2 to change 8 to 6 and add D2 to the line. Now press ENTER and run the program.

You must go slowly when editing long DRAW statements because it is so easy to make a mistake. Therefore, we will make one set of changes, run the program to see if the outline is changing in the desired manner, and then move to the next change.

The next modification begins after the sequence, M+1,-4. Edit Line 100 by typing EDIT100 and pressing ENTER. Next, type 50, use the space bar to move the cursor under the M of M-3,-4, and then type 6DIH3U to delete the six-character move, M-3,-4, replacing it with H3U. Then press ENTER and run the program.

This should accentuate the instep a bit more. To see what we have, mask Line 98 and edit Line 100 to change S40 to S8. After you have done this, run the program. Now our shoe print looks like a shoe print.

How would our shoe look with the sole and heel painted? We want to paint the sole in scale eight (S8) — the size we plan to use in our next tutorial. Therefore, we must use the PMODE4,1 screen, (256,192), and determine our paint points by using PSET.

To locate a point for the sole, key in 110 PSET(10,10,1) and run. Now let's locate a point for the heel. Try typing in 120 PSET(34,8,1) and running the program. It doesn't work. Try reversing the coordinates and running it again. This time it works.

Convert Line 110 to a PAINT statement by typing the following:

```
EDIT110
HPAINT(10,10),1,1
```

Run it and then let's check the heel coordinates. Mask Line 110, and then


*Just in time to help you plan for those stocking stuffers, presenting our annual Christmas sale with offers that can't be resisted! Until December 31, take advantage of our special prices.....*

For that confirmed CoCo nut, how about a disk of Christmas music for Lyra? Now only $9.95 (regularly $14.95). Or for the die-hard enthusiast, the complete **Lyra Lybrary**, normally $179.40, now only $100.00. That's a savings of almost $80! Or choose from a wide variety of music ranging from Bach to the Beatles. Each disk is packed with 5-8 part music, and takes 50 to 80 minutes to play. Included is a player program. Use Lyra for the best results. Each disk $14.95.

**Lyra**, a powerful yet easy-to-use MIDI music composition program, is now better than ever! It has almost all the features you might want, including on-screen transpose, programmable MIDI filter, and comprehensive support of the MIDI standard. Many professional musicians use Lyra as a part of their recording studio, and music teachers find it a great aid to teaching music theory in schools! Version 2.6 comes with a 100 page manual, a CoCo to MIDI cable, and a 30 day money back guarantee (less restocking charge). Until December 31, only $49.95!

**Rulaford Research**
P.O. Box 143
Imperial Beach, CA 92032
(619) 690-3648 (evenings 6-10 PT)

*Other good stuff:* • **FB-01 Calc** is a program that creates event files for Lyra so you can set up custom configurations for your FB-01 from Lyra. Includes a manual packed with useful information about your FB-01. A must if you have an FB-01! $19.95

Ordering information: send check or money order. Sorry, no credit cards. COD is ok. Shipping and handling included in price. CA residents add 6% tax.

edit Line 120 by typing in and running the following:

```
EDIT120
HPAINT(8,34),1,1
```

Finally, unmask Line 110 to see what the painted shoe print looks like.

We have created a shoe print that offers three options for the next tutorial. For practice, get back to the *Big Foot* screen. Mask lines 98,110 and 120, and change S8 to S40 in Line 100. Find the correct PAINT line coordinates and paint the heel and sole in color C1. We will use Line 101 for this PAINT statement. Key in Line 101 without the REM marker and run the listing. What if you wanted to use color C2? Try it and see why I chickened out. Your choices are unlimited.

(When you are finished practicing, put the REM marker back in Line 101.)

Now all we need to do is make the left shoe print. For practice, you could create the left shoe in the same way that we designed the right one.

There is a better way. Flip over your graph paper drawing of the right shoe. You should be able to see the red and black outlines through the paper. (If not, go over the lines again — this time pressing a little harder.

You may want to trace the two outlines onto the back of the paper in order to see the line more clearly. Be careful as you move from point to point. The top of the sole should be outlined in black. Connect the lower red portion and heel separator. And finally, use red ink to run a zigzag line over the units above the heel that we will omit.

The black outline should indicate the final modifications. In pencil, sketch a line at the top of the shoe that moves left three units. Sketch a similar line up from the leftmost point on the shoe. Your point of origin is where these two pencil points meet, and this is where you will begin your second drawing.

(Save a copy or two of your work at this point.)

There are other ways to proceed with this second print, so mark the point of origin as (0,0) and open up more working space on the graph paper screen by changing 82 to 172 in Line 95. Next, add the following line:

```
96 COLOR 1: LINE(82,0)-
(89,190),PSET,BF
```

We will use Line 105 to create the left shoe print. So begin the line by typing the following:

```
DRAW"C3S40BM90,0
```

Go ahead, Rembrandt, create. Copy from your new sketch. *Don't peek at the listing.* Work it out.

When you have completed your masterpiece, there is one slight problem. The shoes are reversed. How would you swap them? It's easy. Just swap the horizontal locating points in lines 100 and 105.

Now let's check out our shoes in PMODE4,1 by unmasking Line 98 and changing S40 to S8 in lines 100 and 105. Now run the listing.

We must move the right shoe print by changing the location of the vertical coordinate to 20 in Line 100.

Paint the prints any way you like, but compare the two prints when you have painted the soles, when you have painted the heels, and when you have painted both. (Next, you may want to try sketching a pair of women's shoes, 6-by-15 units, using the same procedure we have already used.) You may even want to make a copy of your work.

Now, allow me to give you a few suggestions for creating clearer work in less time. First, sketches and drawings stand out best when done on SCREEN1,0 of PMODE4,1.They are as sharply defined as possible on CoCo's high-resolution, two-color screen. Second, when possible, make the entire design one long, continuous line; try to put locating coordinates only in the program's first DRAW statement. This allows much faster execution than when the CoCo is forced to jump from one set of coordinates to another. It also saves on the time it would take to plot those new coordinates. It is easy to pick up a location from a long DRAW statement and know exactly where it is in the sequence of movements. Finally, if you must make long jumps to new areas, use the B DRAW option. It works well when plotting a picture on graph paper.

That's it for this month. Enjoy your new creative abilities — who knows what is next? With CoCo, the DRAW statement and your imagination, the possibilities are endless. □

**The listing:**

```
Ø 'BIGFOOT
5 CLEAR5ØØ
1Ø PMODE3,1:PCLS:SCREEN1,Ø
2Ø A$="D1ØR24Ø":B$="D1ØL24Ø"
3Ø C$="R1ØD19Ø":D$="R1ØU19Ø"
4Ø E$=A$+B$+A$+B$:F$=C$+D$+C$+D$
5Ø DRAW"C2BMØ,ØD1ØR24ØD1ØL24ØD1Ø
R24ØD1ØL24Ø"+E$+E$+E$+A$+B$+A$
6Ø DRAW"BMØ,ØR1ØD19ØR1ØU19ØR1ØD1
9ØR1ØU19Ø"+F$+F$+F$+F$+F$
7Ø DRAW"C2BMØ,ØR24ØD19ØL24ØU19Ø"
8Ø 'DRAW"C4BMØ,4ØR24ØD4ØL24ØD4ØR
24ØD4ØL24Ø"
9Ø 'DRAW"BM4Ø,ØD16ØR4ØU16ØR4ØD16
ØR4ØU16ØR4ØD16Ø"
95 COLOR1:LINE(82,Ø)-(24Ø,19Ø),P
SET,BF
96 'COLOR1:LINE(82,Ø)-(89,19Ø),P
SET,BF
98 'GOTO4ØØ
1ØØ DRAW"C3S4ØBMØ,ØBR3R2FM+2,6D2
M-2,6NL4D3GL2HU3M+1,-4H3UM+2,-6E
"
1Ø1 'PAINT(36,36),1,3:PAINT(36,1
82),1,3
1Ø5 'DRAW"C3S4ØBM9Ø,ØBR3R2FM+2,6
DG3M+1,4NL4D3GL2HU3M-2,-6U2M+2,-
6E"
11Ø 'PAINT(1Ø,1Ø),1,1
12Ø 'PAINT(8,34),1,1
3ØØ GOTO3ØØ
4ØØ PMODE4,1:PCLS:SCREEN1,Ø
41Ø GOTO1ØØ
```

# Computer Island Educational Software

### ARROW GAMES
32K Ext. - $21.95 tape/$26.95 disk
Six menu driven games for young children (ages 3-6) to teach directions. All games involve using the arrow keys ONLY. Games include: LADYBUG, BUTTERFLY, ARROW MATCH, KALEIDOSCOPE, RABBIT and DOODLE. Colorful graphics.

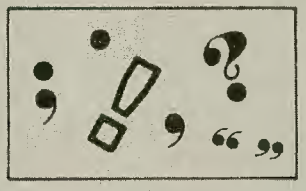
### FIRST GAMES
32K Ext. - $24.95 tape/$29.95 disk
First Games contains 6 menu driven programs to delight and teach your early learners (ages 3-6). These games enrich the learning of colors, numbers, lower case letters, shapes, memory visual discrimination and counting.

### CLOZE STORIES
32K Ext. - $19.95 Tape/$24.95 Disk
These programs give students practice using the popular CLOZE reading technique. Each program contains grade appropriate short stories with key missing words to be deduced by the student. Available for grades 3, 4, 5, 6, OR 7. Please specify.

### DRAWING CONCLUSIONS
32K Ext. - tape $19.95/disk $24.95
These programs contain short stories. Each story has two accompanying questions that ask the student to draw conclusions from the text. Available for grades 3-4 OR 5-6. Please specify.

### LOCATING STORY DETAILS
32K Ext. - disk only - $24.95
These programs contain short stories. Each has an accompanying picture. Questions about story details refer to either the text or pictures. The disk generated graphics are an integral part of these attractive programs. Available for grades 2-3 OR 4-5. Please specify.

### FOREIGN LANGUAGE GAMES
32K Ext. - $19.95 tape/$24.95 disk
(500 words)
**French or Spanish Baseball**
Score base hits or home runs for correct answers. You're out if wrong. Correct answers supplied. Fun way to learn and practice vocabulary. PLEASE SPECIFY LANGUAGE.



### PUNCTUATION PRACTICE
32K Ext. - tape $19.95/disk $24.95
On screen practice in proper usage of the familiar punctuation marks. Grades 3-7.

### MATH TUTOR SERIES
16K Ext.
These tutorials take the child through each step of the example. All programs include HELP tables, cursor and graphic aids. All allow user to create the example, or let the computer choose. Multi-level Great teaching programs.

**LONG DIVISION TUTOR**
$14.95 tape/$19.95 disk
**MULTIPLICATION TUTOR**
$14.95 tape/$19.95 disk
**FACTORS TUTOR**
$19.95 tape/$24.95 disk
**FRACTIONS TUTOR (addition)**
$19.95 tape/$24.95 disk
**FRACTIONS TUTOR (subtraction)**
$19.95 tape/$24.95 disk
**FRACTIONS TUTOR (mult.)**
$19.95 tape/$24.95 disk

### COMPUTER LITERACY
32K Ext. - $19.95 tape/$29.95 disk
A computer literacy quiz exclusively for the Color Computer. Tests and scores from over 60 questions on a Hi-res upper and lower case screen. Reviews computer literacy and beginning programming knowledge. Ages 10 and up.

RAINBOW CERTIFICATION SEAL

Computer Island

(718) 948-2748

VISA

Dept. R 227 Hampton Green, Staten Island, N.Y. 10312

MasterCard

Send for catalog with complete descriptions.

Please add $1.00 per order for postage. N.Y. residents, please add proper tax. FREE set of BINARY DICE, including full directions, with orders of 2 or more items.

**Dealer Inquiries Invited.**

TRS-80 Color Computer

**All Payments in U.S. Funds.**

*Use these routines to let your CoBBS system upload and download Xmodem protocol*

# *CoBBS* Xmodem Routines

## By Robert John Grubb

The *Color BBS System* (*CoBBS*) by Richard Duncan (November 1985, Page 135) is one of the best BBS systems for the Disk BASIC CoCo. However, as the system is written, it has no reliable way of sending and receiving machine language, or packed BASIC programs. To remedy this, I have written two machine language routines that allow *CoBBS* to upload and download using the Xmodem protocol. With these routines, the system can send or receive 100 blocks of data before loading more information or saving the information to disk. At 1200 baud, the system can send or receive one block per second.

Both routines will run on either a CoCo 2 or 3. I have added REMs to mark the lines that are specific to each computer. The programs are written for the CoCo 3 using ON ERR GOTO. When running the programs on a CoCo 2, change those commands to RUN T.

To allow *CoBBS* to run these new routines, a few lines in the main *CoBBS* program must be changed. Delete lines 1200 to 1290 and 20440 to 20950, and add the following lines:

```
1200 POKE&H7E00,B:POKE&H7E01,
TD:POKE&H7E02,ZK:POKE&H7E03,
ZD:FORX=&H0 TO &H3:A$=MID$
(D$,X+1),1):A=ASC(A$):POKE(&H7
E04+X),A:NEXTX
1205 TR$=TR$+"DOWN":GOSUB
9615:PRINT"Loading Download
Protocols.":PRINT"Please
wait . . .":LOAD"XMSEND/SYS",R
1321 CLS:PRINT"1 - ASCII"
:PRINT"2 - Xmodem":PRINT"3
- Press <CR> to exit"
1322 GOSUB600:ON ERRGOTO1300
:X=VAL(CH$):IFX=0THENRETURN
ELSE IF X>0 OR X<3THEN PRINT
TAB(3)CH$ELSE1322
1323 IF X=2 THENPOKE&H7E00,
TD:LOAD"XMRECV/SYS",R
```

Make sure you make these changes to COBBS.SYS from a freshly powered-up computer *after* a PCLEAR1 statement, or you will lose some of the programming when you save it to disk.

### Receiving Uploads

XMRECV.SYS lets you receive uploads to *CoBBS*. When users first enter into this routine, they are prompted to press ENTER to continue. Line 40 contains a password that you, as SysOp, should choose. Any user who enters the correct password at this time can get a directory listing on all your drives. The user can then upload any file to any disk; and if that user uploads a file already on the disk, *the file is overwritten.*

If the correct password is entered, the screen will prompt File to U/L:. The user should then enter an eight-character filename. Next, the prompt EXT: will ask for a three-character

*Robert Grubb enjoys using his CoCo's for MIDIing his synthesizers, running a BBS, and playing games with his two sons. He enjoys programming in BASIC and machine language. Currently, he is working on an OS-9 Level II BBS system.*

extension. Finally, the routine asks for the drive number (zero to three). The routine now tells the user to start sending. The host computer's screen clears, and shows the number of blocks received until the upload is finished.

To get a directory listing and granule count, the user types DIR (upper or lower case) for the filename and ENTER for the extension. The user then enters the desired drive number. At the end of the listing, the system identifies the number of free grans left on that disk.

If the user does not enter the correct password, the system identifies the number of free grans and asks for a *filename only.* The system takes this name, adds the extension /XUP to that filename and puts the file on the drive specified in the data line of the *CoBBS* menu.

When the upload is complete, the system asks the user if another file will be uploaded. If so, then the system reruns the program. XMRECV.SYS is a program that asks the user to type U to upload [See "*CoBBS*: A Look at the Commands," December '85, Page 153]. XMRECV.SYS has the same data types as the ASCII version of *CoBBS* with one exception: While entering the correct password gives users full access to all disks, without this password users may upload only filenames with the extension /XUP.

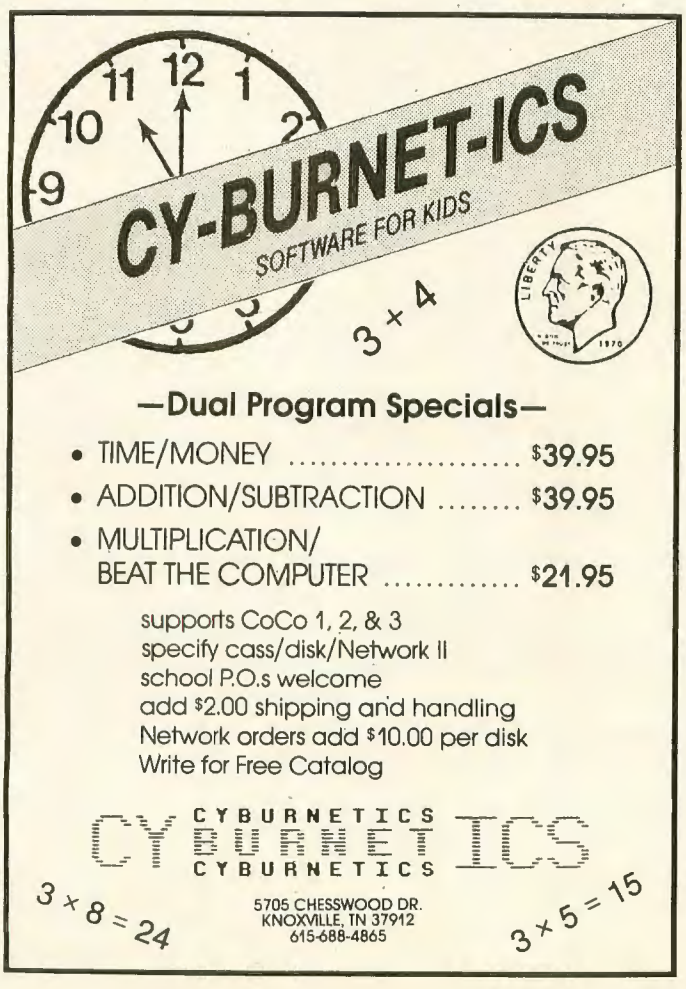
All uploaded programs are saved as ASCII files on the disk. As SysOp, you can change the filenames to names that can be downloaded without problem. If you want to run the programs on your CoCo, convert them to the proper type (i.e., .BIN, or .BAS) before you can run them. In the listings you will find a public domain file, FCONV.BAS, that will convert files for you. The file includes instructions.

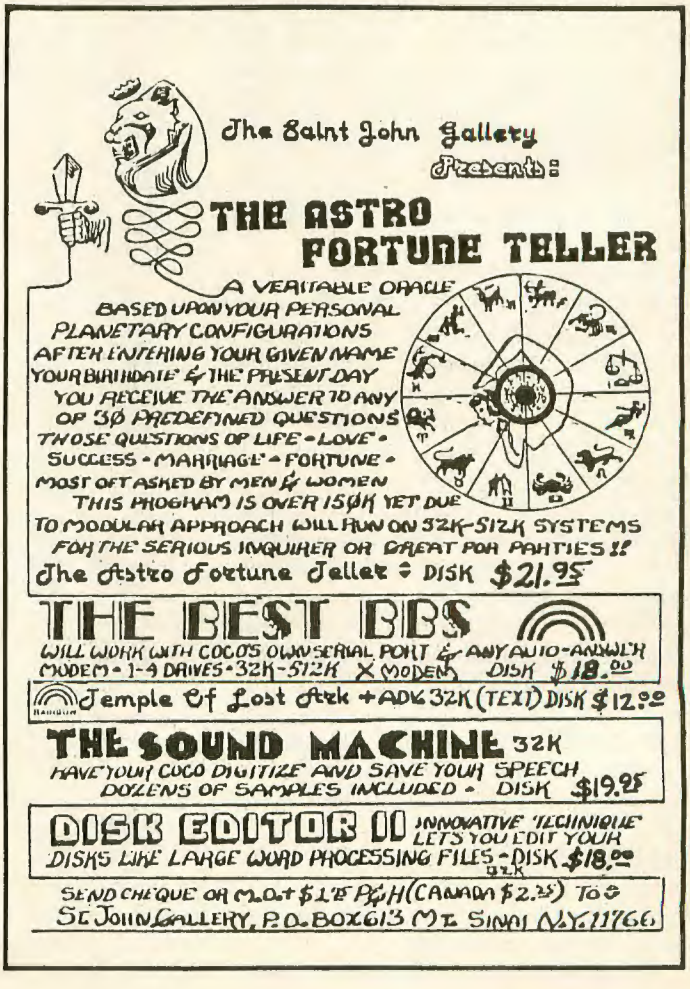
XMRECV.ASM is the source code to the machine language routine used by XMRECV.SYS. I assembled it on the Radio Shack Disk *EDTASM+* assembler. Type it in and assemble it to the *CoBBS* system disk as XMRECV.BIN.

Those of you who do not have an assembler can type in the BASIC pro-

**Listing 1:** XMRECV.ASM

```
00005          TITLE   XMRECV/BIN (C) 1986 JOHN GRUBB
00010 ****************************************
00020 * XMRECV/BIN FOR THE CoBBS XMRECV/SYS *
00030 * XMODEM TRANSFERS. COPYRIGHT 1986 (C)*
00040 *              JOHN GRUBB              *
00050 *            RT 4 BOX 309              *
00060 *          GALLIPOLIS, OHIO            *
00070 *                45631                 *
00080 *        PHONE (614)-446-7430          *
00090 ****************************************
00100 * YOU MAY USE THIS PROGRAM WITHOUT     *
00110 * CHARGE AS LONG AS ALL CREDITS        *
00120 * REMAIN INTACT.                       *
00130 ****************************************
00140 * YOU MUST USE THIS PROGRAM WITH THE   *
00150 * BASIC PROGRAM "XMRECV/SYS" AS THE    *
00160 * PROGRAMS EXPECT DATA FROM EACH       *
00170 * OTHER. THESE PROGRAMS ARE EASILY     *
00180 * MODIFIED FOR YOUR PERSONAL USE.,.    *
00190 ****************************************
7E00  00200          ORG     $7E00
00210 *********V 1.01*************
```

gram, XMRECPK.BAS. This file will poke the values into upper RAM and save it to your disk. I have included checksums so that any mistakes may be identified by the line number.

### Sending Files

XMSEND.SYS lets you send programs via Xmodem. This file uses the same kinds of menus as the ASCII version. In this manner, *the system* remains virtually the same as it was originally set up by Richard Duncan. Therefore, you do not have to relearn how to set up downloads for your system.

On your *CoBBS* menu, press D to download. The data specification is 0COCO. The buffer number is 0, which means that the user's buffer is not opened and closed automatically. If the buffer number is 1 instead, the buffer opens, the directory is listed and the buffer is then closed. COCO is a four-character filename, in front of which the system adds DOWN, and at the end of which it adds /MNU. Therefore, the system searches all drives to locate a menu called DOWNCOCO/MNU.

The buffer numbers 3 and 4 change the data to BDPxxx, where B identifies the download type; D identifies the drive from which to download; and P allows no downloads of files with the extensions /SYS, /BIN or /BAK. When the buffer number is 3, the user can download only from the drive specified. When it is 4, the user has full access to all drives. The buffer numbers 3 and 4 allow the user to type DIR to get a directory on any drive.

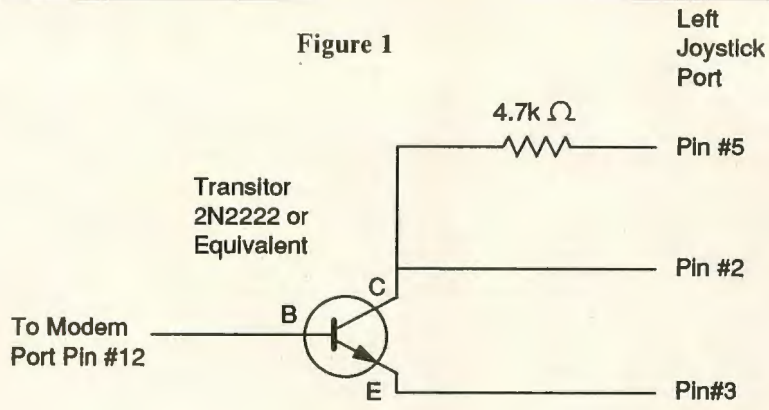
When the variable B is either 3 or 4, the computer screen will prompt File to D/L:. At this time, the user should enter the eight-character filename and extension to be downloaded. The system then asks for a drive number. If the file exists on that drive, the user is prompted for download type (i.e., ASCII/buffer control, ASCII/no buffer control, or Xmodem). If Xmodem is selected, the system does a block count and asks if the user wants to continue. (The system offers several places to abort in case users change their minds.) The system then goes to Receive mode and begins sending the program. If Variable B is either 0 or 1, the system displays the menu and then asks for the number to download. Once the system makes sure the file exists, it performs in the same manner as when 3 or 4 is the buffer code.

The ASCII transfers are the same as in the original *CoBBS* system.

Because the system takes the number

```
7E00                    0022 BUFFER  RMB     128
7E80                    0023 COUNT   RMB     1
7E81                    0024 BLKIN   RMB     1
7E82                    0025 RECOM   RMB     1
7E83                    0026 CHKSU   RMB     1
7E84 86   00            0027 INIT    LDA     #$0
7E86 5F                 0028         CLRB
7E87 6F   8C F6         0029         CLR     COUNT,PCR
7E8A 30   8D FF72       0030         LEAX    BUFFER,PCR
7E8E A7   80            0031 LOOP1   STA     ,X+     *CLEAR OUT THE BUFFER
7E90 5C                 0032         INCB
7E91 C1   80            0033         CMPB    #128    *END OF BUFFER?
7E93 26   F9            0034         BNE     LOOP1   *NOPE? GO FINISH
                        0035 *******START RECEIVE******
7E95 86   15            0036 REC     LDA     #21     *SEND ORIGINAL NAK
7E97 17   006B          0037         LBSR    SEND    *GO SEND IT
7E9A 86   00            0038         LDA     #0
7E9C A7   8D 00A8       0039         STA     TIMER,PCR       *RESET TIMER
7EA0 CE   0000          0040 TRIP    LDU     #0      SET TIMER TO 0
7EA3 17   007C          0041         LBSR    RECEV
7EA6 81   01            0042         CMPA    #1      *IS IT START OF BLOCK?
7EA8 27   19            0043         BEQ     BLOCK   *YES? GO GET REST
7EAA B7   7FFE          0044         STA     $7FFE   *SAVE IT
7EAD 81   18            0045         CMPA    #24     *ABORT??
7EAF 27   53            0046         BEQ     EXIT    *THEN QUIT
7EB1 81   04            0047         CMPA    #4      *END OF FILE?
7EB3 27   4F            0048         BEQ     EXIT    *THEN QUIT
7EB5 6C   8D 008F       0049         INC     TIMER,PCR       *INCREASE TIMER
7EB9 A6   8D 008B       0050         LDA     TIMER,PCR
7EBD 81   FF            0051         CMPA    #$FF    *IS IT 255?
7EBF 26   DF            0052         BNE     TRIP    *NO? GO ADD MORE TO TIMER
7EC1 20   D2            0053         BRA     REC
                        0054 **************GET BLOCK******************************
7EC3 17   004A          0055 BLOCK   LBSR    RECEV1
7EC6 A7   8C B8         0056         STA     BLKIN,PCR       *BLOCK #
7EC9 17   0044          0057         LBSR    RECEV1
7ECC A7   8C B3         0058         STA     RECOM,PCR       COMPLEMENT
7ECF 30   8D FF2D       0059         LEAX    BUFFER,PCR      *BUFF ADDRESS
7ED3 17   003A          0060 LOOP2   LBSR    RECEV1  *GET CHARACTER
7ED6 A7   80            0061         STA     ,X+     *PUT IN BUFFER
7ED8 6C   8C A5         0062         INC     COUNT,PCR       *KEEP TRACK
7EDB A6   8C A2         0063         LDA     COUNT,PCR       *TILL END
7EDE 81   80            0064         CMPA    #128    *OF BUFFER
7EE0 26   F1            0065         BNE     LOOP2   *GET NEXT CHARACTER
7EE2 17   002B          0066 CKSUM   LBSR    RECEV1  *GO GET CHECK
7EE5 A7   8C 9B         0067         STA     CHKSU,PCR       *SUM
                        0068 *********COMPUT CHECK SUM*********************
7EE8 30   8D FF14       0069         LEAX    BUFFER,PCR      *POINT BUFFER
7EEC 5F                 0070         CLRB            *SET UP COUNTER
7EED A6   80            0071         LDA     ,X+     *GET CHARACTER
7EEF 5C                 0072 LOOP3   INCB            *ADD TO COUNT UNTIL
7EF0 C1   80            0073         CMPB    #128    *END OF
7EF2 27   04            0074         BEQ     RESEND  *BUFFER THEN QUIT
7EF4 AB   80            0075         ADDA    ,X+     *ADD TO CHECKSUM
7EF6 20   F7            0076         BRA     LOOP3   *GET NEXT
7EF8 A1   8C 88         0077 RESEND  CMPA    CHKSU,PCR
7EFB 27   07            0078         BEQ     EXIT    *ON MATCH LEAVE
7EFD 86   15            0079         LDA     #21     *SEND NAK NEXT
7EFF B7   7E96          0080         STA     REC+1   *PUT IN PGM
7F02 20   80            0081         BRA     INIT    *RESEND BLOCK
7F04 39                 0082 EXIT    RTS
7F05 F6   FF69          0083 SEND    LDB     $FF69   *CHECK STATUS OF PAK
7F08 C4   10            0084         ANDB    #$10    *IS PACK READY TO SEND?
7F0A 27   F9            0085         BEQ     SEND    *NOPE, TRY AGAIN
7F0C B7   FF68          0086         STA     $FF68   *YES, SEND IT.
7F0F 39                 0087         RTS
7F10 B6   FF69          0088 RECEV1  LDA     $FF69   *CHECK STATUS OF PAK
7F13 84   20            0089         ANDA    #$20    *CARRIER??
7F15 26   28            0090         BNE     NOC     *NOPE? GO TELL BASIC AND EXIT
7F17 B6   FF69          0091         LDA     $FF69   *SEE IF PACK HAS A CHR?
7F1A 84   08            0092         ANDA    #$8
7F1C 27   F2            0093         BEQ     RECEV1  *NOPE, TRY AGAIN
7F1E B6   FF68          0094         LDA     $FF68   *YES, GET IT
7F21 39                 0095         RTS
7F22 B6   FF69          0096 RECEV   LDA     $FF69   *CHECK STATUS OF PAK
7F25 84   08            0097         ANDA    #$08
7F27 27   04            0098         BEQ     CARIER  *NOPE? GO CHECK CARRIER
7F29 B6   FF68          0099         LDA     $FF68   *LOAD IT
7F2C 39                 0100         RTS
7F2D B6   FF69          0101 CARIER  LDA     $FF69   *CHECK STATUS OF PAK
7F30 84   20            0102         ANDA    #$20    *CHECK CARRIER
7F32 26   0B            0103         BNE     NOC     *NOPE? GO TELL BASIC AND EXIT
7F34 86   00            0104         LDA     #0
7F36 33   41            0105 JUNK    LEAU    +1,U
7F38 1183 0050          0106         CMPU    #$50    *END OF BUFFER?
7F3C 26   E4            0107         BNE     RECEV   *NO? GET SOME MORE
7F3E 39                 0108         RTS
7F3F 86   18            0109 NOC     LDA     #24     * LOAD REGISTER THEN
7F41 B7   7FFE          0110         STA     $7FFE   *SEND IT TO BASIC PROGRAM
7F44 20   BE            0111         BRA     EXIT
7F46 32   7E            0112         LEAS    -2,S
7F48                    0113 TIMER   RMB     1
          0000          0114         END

00000 TOTAL ERRORS
```

**Figure 1**




Joystick modification for 1200 baud modem detection.
Modem must support Pin 12 high speed indication.

**Listing 2:** XMSEND.ASM

```
                    00005          TITLE   XMSEND/BIN (C) 1986 John Grubb
                    00010 ****************************************
                    00020 * XMSEND/BIN FOR THE CoBBS XMSEND/SYS *
                    00030 * XMODEM TRANSFERS. COPYRIGHT 1986 (C)*
                    00040 *                JOHN GRUBB            *
                    00050 *             RT 4, BOX 309            *
                    00060 *            GALLIPOLIS, OHIO          *
                    00070 *                  45631               *
                    00080 *          PHONE:(614)-446-7430        *
                    00090 ****************************************
                    00100 * YOU MAY USE THIS PROGRAM WITHOUT     *
                    00110 * CHARGE AS LONG AS ALL CREDITS       *
                    00120 * REMAIN INTACT.                      *
                    00130 ****************************************
                    00131 * YOU MUST USE THIS PROGRAM WITH THE  *
                    00132 * BASIC PROGRAM "XMSEND/SYS" AS THE   *
                    00133 * PROGRAMS EXPECT DATA FROM EACH      *
                    00134 * OTHER. THESE PROGRAMS ARE EASILY    *
                    00135 * MODIFIED FOR YOUR PERSONAL USE...   *
                    00136 ****************************************
7E00                00140          ORG     $7E00
                    00150 ******** GET INFO FROM BASIC ********
7E00 10EF 8D 011B   00160          STS     STACK,PCR       *STORE STACK POINTERS
7E05 BD   B3ED      00170          JSR     $B3ED           *GET PARAMETERS FROM BASIC
7E08 1F   02        00180          TFR     D,Y             *MOVE TO Y
7E0A E6   A4        00190          LDB     ,Y              *LENGTH OF STRING
7E0C AE   22        00200          LDX     2,Y             *GET STRING LOCATION
7E0E C1   80        00210          CMPB    #$80            *128 BYTES?
7E10 1026 00EB      00220          LBNE    ERR1            *NO? THEN GO REPORT
7E14 5F             00230          CLRB
7E15 6F   8D 0103   00240          CLR     TRIES,PCR       *CLEAR RETRIES
                    00250 ********** SETUP FOR BLOCK HEADER DATA ********
7E19 86   01        00260 SETUP    LDA     #$1             *<SOH>
7E1B 8D   5C        00270          BSR     SETSND          *SEND IT
7E1D A6   8D 00FA   00280          LDA     BLOCK,PCR       *GET BLOCK NUMBER
7E21 8D   56        00290          BSR     SETSND          *SEND IT
7E23 88   FF        00300          EORA    #$FF            *COMPLIMENT OF BLOCK NUMBER
7E25 8D   52        00310          BSR     SETSND          *SEND IT
7E27 5F             00320          CLRB
7E28 CE   0000      00330          LDU     #$0             *LOAD U TO
7E2B EF   8D 00EA   00340          STU     CHKSU,PCR       *CLEAR CHEKSUM
                    00350 ******** SEND THE BLOCK **********
7E2F A6   80        00360 SNDBLK   LDA     ,X+             *LOAD STRING BYTE
7E31 8D   46        00370          BSR     SETSND          *SEND IT
7E33 34   04        00380          PSHS    B
7E35 34   02        00390          PSHS    A
7E37 4F             00400          CLRA
7E38 34   02        00410          PSHS    A
7E3A EC   8D 00DB   00420          LDD     CHKSU,PCR       *GET CHECKSUM
7E3E E3   E1        00430          ADDD    ,S++            *ADD BYTE TO IT
7E40 ED   8D 00D5   00440          STD     CHKSU,PCR       *NOW SAVE IT
7E44 35   04        00450          PULS    B
7E46 5C             00460          INCB
7E47 C1   80        00470          CMPB    #$80            *IS IT 128 BYTES?
7E49 27   02        00480          BEQ     ENDBLK          *THEN GO SEND CHECKSUM
7E4B 20   E2        00490          BRA     SNDBLK          *GO SEND REST OF BLOCK
                    00500 ******** SEND THE CHECKSUM **********
7E4D A6   8D 00C9   00510 ENDBLK   LDA     SUM,PCR         *GET LAST 8 BYTES OF CHECKSUM
7E51 8D   26        00520          BSR     SETSND          *AND SEND IT
7E53 8D   69        00530          BSR     SETREC          *GO WAIT FOR ANSWER
7E55 81   06        00540          CMPA    #$6             *IS IT <ACK>?
7E57 26   09        00550          BNE     RESND           *NO? SEND LAST BLOCK AGAIN
7E59 6F   8D 00BF   00560          CLR     TRIES,PCR       *CLEAR TRIES, AND GO FOR NEXT BLO
```

entered by the user and adds COCO to the front and /DOW to the end of that number, you will need to make a text file called DOWNCOCO/MNU that lists a number, program name and a description of that program. If a user enters 1 for download, the system looks on all drives for a file named COCO1/DOW If the system locates that filename, it asks for the type of download (ASCII or XModem). From that point, the system prompts the user throughout the procedure.

XMSEND.ASM is the source code to the program XMSEND.BIN, which is used by XMSEND.SYS. Assemble it to your system disk as XMSEND.BIN. As with the other source code program, if you don't have an assembler, type in the program XMSNDPK.BAS. It will poke the routine in high RAM and then save it to disk.

### 1200-Baud Modification

In this article, I have included a schematic (Figure 1) describing the use of a transistor in determining the baud rate of a modem with a High Speed Indication Line (Pin 12 on the modem). This information is read by *CoBBS* through the left joystick port, and the entire circuit will fit inside the joystick plug. Cut Line 12 in the DB25 cable, which connects the modem to the RS-232 pack, and send it to the circuit. Next, change Line 40 in the USER.SYS program to read as follows:

```
40 CLS:EXEC&H10DA:POKE4657,0
:GOSUB10035
```

Add the following lines:

```
10035 IF JOYSTK(0)<30 THEN
POKE 65387,56:PRINT"CONNECTED
AT 1200 BAUD":FOR X=1 TO 900:
NEXTX:RETURN
10036          POKE65387,54:PRINT"
CONNECTED          AT     300
BAUD":FORX=1TO900:NEXTX:RETURN
10037 GOTO10035
```

You may have to play with the value returned by JOYSTK(0) to find the best value for your modem.

Enjoy these programs. If there are any problems, I can be reached on Delphi (username GRUBBY), or call my BBS at (614) 446-7430. I am online Friday through Sunday, from 6 p.m to 11:30 p.m., at 300/1200 baud 8-bit, 1 stop bit, no parity.

*(Questions or comments about the programs may also be directed to the author at Route 4, Box 309, Gallipolis, OH 45631. Please enclose an SASE when requesting a reply.)* □

*Hint . . .*

# What's in Memory?

Until you type the DOS command, the computer's memory is mostly concerned with Color Computer BASIC. Once the DOS command calls the OS-9 operating system into action, the computer memory locations take in all sorts of procedures. When you use the mdir (module directory) command, a screen display of all modules now in memory appears.

Some of the modules listed on your screen are identical to those you will find in the CMDS (commands) directory of your OS-9 system disk. For instance, such often-used commands as del (delete), list and load are in memory and also available on the disk in the CMDS directory. But an infrequently used command like backup is found only on the disk.

Other modules listed to the screen when you use the mdir command are not on your disk. Most such modules are not usually commands, and thus not executable. Most of them relate to OS-9 system functions.

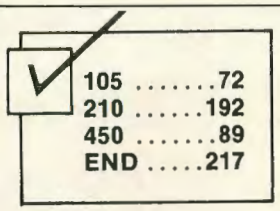
You can load commands into memory using the load command. For instance, if you type load backup, then the backup command enters memory as a module along with the other 50 or more modules. It stays there until you type unlink backup.

When you use the backup command without first loading it into memory, it is automatically loaded into memory, does its backup work, and then is automatically *unlinked* to remove itself from memory. If these things are done automatically, then why ever load backup into memory?

When you buy an OS-9-driven commercial program (say, a game), the backup command is not likely to be on the disk. You could then load backup into memory from your system disk, replace it with your new game disk, and then call for a backup, running it from memory. You should unlink backup once the job is finished.

*Del Turner, Kamloops, BC*

```
CK
7E5D 4F             00570         CLRA
7E5E 5F             00580         CLRB
7E5F 16   00A0      00590         LBRA    EXIT            *GO RETURN TO BASIC
                    00600 ******* NOT ACK, RESET BLOCK AND SEND IT
7E62 30   88 80     00610 RESND   LEAX    -$80,X          *RESET START OF BLOCK
7E65 6C   8D 00B3   00620         INC     TRIES,PCR       *ADD 1 TO TRIES
7E69 34   02        00630         PSHS    A
7E6B A6   8D 00AD   00640         LDA     TRIES,PCR
7E6F 81   06        00650         CMPA    #$6             *IS IT 6 RETRIES?
7E71 1020C 009F     00660         LBGE    ERR4            *IF SO, GO
7E75 35   02        00670         PULS    A
7E77 20   A0        00680         BRA     SETUP
                    00690 ****** SET UP TO SEND DATA ************
7E79 34   02        00700 SETSND  PSHS    A               *PUT ON STACK
7E7B 34   40        00710         PSHS    U
7E7D CE   0000      00720         LDU     #$0
7E80 EF   8D 009A   00730         STU     COUNT,PCR       *CLEAR COUNTER
7E84 6F   8D 0095   00740         CLR     TIMER,PCR       *CLEAR TIMER
7E88 35   40        00750         PULS    U
7E8A B6   FF69      00760 SEND    LDA     $FF69
7E8D 84   10        00770         ANDA    #$10            *IS PAK READY?
7E8F 27   06        00780         BEQ     CONT1           *NOPE
7E91 35   02        00790         PULS    A               *PULL FROM STACK
7E93 B7   FF68      00800         STA     $FF68           *AND SEND IT
7E96 39             00810         RTS
                    00820 ******* TIME OUT ROUTINE FOR SENDING BLOCK
7E97 34   10        00830 CONT1   PSHS    X
7E99 AE   8D 0081   00840         LDX     COUNT,PCR       *LOAD COUNTER
7E9D 30   01        00850         LEAX    1,X             *ADD 1 TO IT
7E9F AF   8D 007B   00860         STX     COUNT,PCR       *SAVE IT
7EA3 27   04        00870         BEQ     TIMER1          *IF OVER 255 THEN ADD TO TIMER
7EA5 35   10        00880         PULS    X
7EA7 20   E1        00890         BRA     SEND
7EA9 34   04        00900 TIMER1  PSHS    B
7EAB E6   8D 006E   00910         LDB     TIMER,PCR       *LOAD TIMER
7EAF 5C             00920         INCB                    *ADD 1 TO IT
7EB0 C1   03        00930         CMPB    #$3             *3 TIME OUTS?
7EB2 27   56        00940         BEQ     ERR2            *GO REPORT IT
7EB4 E7   8D 0065   00950         STB     TIMER,PCR       *SAVE IT
7EB8 35   04        00960         PULS    B
7EBA 35   10        00970         PULS    X
7EBC 20   CC        00980         BRA     SEND
                    00990 ******* SET UP TO RECV A BYTE *****
7EBE 34   40        01000 SETREC  PSHS    U
7EC0 CE   0000      01010         LDU     #$0
7EC3 EF   8D 0057   01020         STU     COUNT,PCR       *CLEAR COUNTER
7EC7 6F   8D 0052   01030         CLR     TIMER,PCR       *CLEAR TIMER
7ECB 35   40        01040         PULS    U
7ECD B6   FF69      01050 RECV    LDA     $FF69
7ED0 84   08        01060         ANDA    #$8             *ANYTHING IN PAK?
7ED2 27   04        01070         BEQ     CONT2           *NO, ADD TO TIMER
7ED4 B6   FF68      01080         LDA     $FF68           *LOAD IT
7ED7 39             01090         RTS
                    01100 ******* TIME OUT ROUTINE FOR RECEIVEING ACK
7ED8 34   10        01110 CONT2   PSHS    X
7EDA AE   8D 0040   01120         LDX     COUNT,PCR       *LOAD COUNTER
7EDE 30   01        01130         LEAX    1,X             *ADD 1 TO IT
7EE0 AF   8D 003A   01140         STX     COUNT,PCR       *SAVE IT
7EE4 27   04        01150         BEQ     TIMER2          *OVER 255, THEN ADD TO TIMER
7EE6 35   10        01160         PULS    X
7EE8 20   E3        01170         BRA     RECV
7EEA 34   04        01180 TIMER2  PSHS    B
7EEC E6   8D 002D   01190         LDB     TIMER,PCR       *LOAD TIMER
7EF0 5C             01200         INCB                    *ADD 1 TO IT
7EF1 C1   15        01210         CMPB    #$15            *IS IT OVER $15?
7EF3 2C   1A        01220         BGE     ERR3            *GO REPORT IT
7EF5 E7   8D 0024   01230         STB     TIMER,PCR       *ELSE SAVE IT
7EF9 35   04        01240         PULS    B
7EFB 35   10        01250         PULS    X
7EFD 20   CE        01260         BRA     RECV
                    01270 ******* SET UP FOR ERROR REPORTS
7EFF 4F             01280 ERR1    CLRA
7F00 C6   01        01290         LDB     #$1             *STRING ERROR
                    01300 **** NEXT STATEMENT SENDS DATA BACK TO BASIC'S VARPTR
7F02 10EE 8D 0019   01310 EXIT    LDS     STACK,PCR       *RESTORE POINTERS
7F07 7E   B4F4      01320         JMP     $B4F4           *PUT PARAM BACK TO BASIC
7F0A CC   0002      01330 ERR2    LDD     #$2             *COMMUNICATIONS FAILURE
7F0D 20   F3        01340         BRA     EXIT
7F0F CC   0003      01350 ERR3    LDD     #$3             *XMODEM TIME OUT
7F12 20   EE        01360         BRA     EXIT
7F14 CC   0004      01370 ERR4    LDD     #$4             *6 RETRIES ATTEMPTED
7F17 20   E9        01380         BRA     EXIT
                    01390 ******* PROGRAM VARIABLES **************
7F19                01400 CHKSU   RMB     1
7F1A                01410 SUM     RMB     1
7F1B                01420 BLOCK   RMB     1               *POKED IN BY BASIC PROGRAM
7F1C                01430 TRIES   RMB     1
7F1D                01440 TIMER   RMB     1
7F1E                01450 COUNT   RMB     2
7F20                01460 STACK   RMB     2
          0000      01470         END

00000 TOTAL ERRORS
```




**Listing 3:** XMRECV.SYS

```
Ø 'XMRECV.SYS V2.1
1 'COPYRIGHT 1986 BY JOHN GRUBB
2 'PROGRAM TO ALLOW UPLOADS TO T
HE
3 'COBBS BBS SYSTEM
4 'MUST USE XMRECV/BIN WITH THIS
 PROGRAM
1Ø ON ERR GOTO 44Ø
15 FS=PEEK(&H7EØØ)
2Ø CLEAR 15ØØØ,&H7BFE:EC=Ø:PRINT
CHR$(12):'CHANGE CLEAR TO CLEAR
15ØØ,&H7ØØØ FOR COCO II VERSION
25 DIM RC$(1ØØ)
3Ø PRINT"CoBBS Xmodem Uploader V
2.1":PRINT"By John Grubb":PRINT"
Copyright 1986":PRINT:PRINT:PRIN
T"Please press RETURN to continu
e...";:PRINTCHR$(7)
4Ø PW$="PASSWORD"
5Ø LINEINPUTP$:IF P$<>PW$ THEN G
OTO 14Ø
6Ø FT$="":EX$="":D$=""
7Ø LINEINPUT"File to U/L: ";FT$:
IFLEN(FT$)>8THENPRINTCHR$(7):GOT
O7Ø
8Ø LINEINPUT"         EXT: ";EX$:
IFLEN(EX$)>3THENPRINTCHR$(7):GOT
O8Ø
9Ø LINEINPUT"    DRIVE #: ";D$:D
=VAL(D$):IF D<Ø OR D>3 THENPRINT
CHR$(7):GOTO9Ø
1ØØ IF LEFT$(FT$,3)="DIR" OR LEF
T$(FT$,3)="dir" THEN11ØELSEIFFT$
=""THEN44Ø
1Ø5 F$=FT$+"/"+EX$+":"+D$:GOTO21
Ø
11Ø IF D=1 THEN DIR1:GOTO13ØELSE
IFD=2 THEN DIR2:GOTO13Ø
12Ø IF D=Ø THEN DIRØELSEDIR3
13Ø PRINT"Free Grans: ";:PRINTFR
EE(D):GOTO6Ø
14Ø ON ERR GOTO6ØØ:PRINT"Checkin
g free disk space. Please wait..
."
15Ø X=FREE(FS):IF X<5 THENPRINT"
Sorry, Disk is FULL!...":PRINTCH
R$(7):GOTO44Ø
16Ø PRINT X;" Grans Free"
17Ø ON ERR GOTO 6ØØ
18Ø PRINT"Filename (8 Chars or l
ess). Do not use ";CHR$(34);"/";
CHR$(34);")":PRINT"Enter nothing
 to ABORT"
19Ø LINEINPUT"FILENAME >>";F$:IF
 F$="" THEN PRINT"Aborted":GOTO4
4Ø
195 IF INSTR(F$,"/")>Ø THEN 6ØØ
ELSE IFINSTR(F$,".")>Ø THEN 6ØØ
2ØØ F$=F$+"/XUP:"+RIGHT$(STR$(FS
),1):ON ERR GOTO21Ø:OPEN"I",#1,F
$:CLOSE:PRINT"I have that....":G
OTO14Ø
21Ø ON ERR GOTO 44Ø:A$=" ":POKEV
ARPTR(A$),&H8Ø:POKEVARPTR(A$)+2,
&H7E:POKEVARPTR(A$)+3,Ø
22Ø POKE&H7FFE,Ø:POKE&H7E96,21
23Ø CLS
24Ø OPEN"O",#1,F$:BL=Ø:ON ERR GO
TO 42Ø
25Ø PT=PEEK(&HFF22)AND1:IFPT=1TH
EN26ØELSEPRINT#-2,"Uploaded ";F$
26Ø LOADM"XMRECV/BIN":POKE&H7E96
,21
27Ø PRINT"Begin file transmissio
n.":PRINT"On MIKEY TERM press <D
OWNARROW> <3>."
28Ø CLS2:FORX=1TO8ØØØ:NEXTX:GOSU
B875
29Ø RD=Ø:T=Ø
3ØØ GOSUB 54Ø
31Ø FORX=1TO2ØØØ:NEXTX
32Ø EXEC&H7E84
33Ø A=PEEK(&H7FFE)
34Ø IF A=24 OR A=13 THEN 38Ø
35Ø IF A=4 THEN 49Ø
36Ø GOSUB 45Ø
37Ø POKE &H7E96,6:GOTO 32Ø
38Ø GOSUB 57Ø
39Ø IF BL=Ø THEN 41Ø
4ØØ FOR X=1 TO BL:PRINT#1,RC$(X)
;:NEXT X
41Ø CLOSE#1:CLEAR 2ØØ,&H7FFE:GOS
UB885
42Ø FOR X=1 TO 5:PRINTCHR$(7);:N
EXT X
43Ø GOSUB7ØØ:LINEINPUT"Upload an
other (Y/N)";Q$:IF LEFT$(Q$,1)="
Y" OR LEFT$(Q$,1)="y" THENGOTO 3
Ø
44Ø CLEAR 2ØØ,&H7FFF:PRINT"Loadi
ng Main System... Please wait...
":CLOSE:UNLOAD:RUN"COBBS.STM"
45Ø A$=" ":POKEVARPTR(A$),&H8Ø:P
OKEVARPTR(A$)+2,&H7E:POKEVARPTR(
A$)+3,Ø
46Ø BL=BL+1:RC$(BL)=A$:POKE 1Ø24
,BL AND 255
461 LOCATE1Ø,1Ø:PRINT"Blocks Rec
eived ";BL;:'USE THIS FOR COCO I
II
462 REM PRINT @33,"BLOCKS RECEIV
ED ";BL;:'USE THIS FOR COCO II
47Ø IF BL<1ØØ THEN RETURN
48Ø FOR X=1 TO 1ØØ:PRINT#1,RC$(X
);:NEXT X:BL=Ø:RETURN
49Ø '
```

```
5ØØ T=Ø
51Ø E=PEEK(&HFF69):F=E AND 16
52Ø IF F THEN POKE&HFF68,6:GOTO
38Ø
53Ø T=T+1:IF T<1ØØØ THEN 51Ø ELS
E PRINT"PAK NOT READY!":GOSUB57Ø
:GOTO44Ø
54Ø POKE&HFF6A,PEEK(&HFF6A) AND
&H9F
55Ø POKE&HFF6B,PEEK(&HFF6B) AND
&H9F
56Ø RETURN
57Ø POKE&HFF6A,PEEK(&HFF6A) OR &
H6Ø
58Ø POKE&HFF6B,PEEK(&HFF6B) OR &
H2Ø
59Ø RETURN
6ØØ EC=EC+1:IF EC=5 THEN44ØELSE1
8Ø
7ØØ IFPEEK(4658)=ØTHEN71ØELSE CD
=PEEK(65385):CD=CD AND 32:IF CD<
>Ø OR PEEK(4657)<>Ø THEN44ØELSE7
1Ø
71Ø RETURN
875 POKE&HØ168,PEEK(4681):POKE&H
Ø169,PEEK(4682):RETURN
885 POKE&HØ168,&H1Ø:POKE&HØ169,&
HE6:RETURN
```

**Listing 4:** XMRECPK.BAS

```
Ø 'XMRECPK.BAS V2.1
1 'COPYRIGHT 1986 BY JOHN GRUBB
2 'THIS ROUTINE POKES THE
3 'MACHINE CODE FOR THE
4 'XMRECV/BIN ROUTINE
1Ø DATA  134, Ø, 95, 111, 14Ø, 2
46, 48, 141, 255, 114, 167, 128,
 92, 193, 128, 38, 249, 134, 21,
 23, Ø, 1Ø7, 134, Ø, 167, 2865
2Ø DATA  141, Ø, 168, 2Ø6, Ø, Ø,
 23, Ø, 124, 129, 1, 39, 25, 183
, 127, 254, 129, 24, 39, 83, 129
, 4, 39, 79, 1Ø8, 2Ø54
3Ø DATA  141, Ø, 143, 166, 141,
Ø, 139, 129, 255, 38, 223, 32, 2
1Ø, 23, Ø, 74, 167, 14Ø, 184, 23
, Ø, 68, 167, 14Ø, 179, 2782
4Ø DATA  48, 141, 255, 45, 23, Ø
, 58, 167, 128, 1Ø8, 14Ø, 165, 1
66, 14Ø, 162, 129, 128, 38, 241,
 23, Ø, 43, 167, 14Ø, 155, 281Ø
5Ø DATA  48, 141, 255, 2Ø, 95, 1
66, 128, 92, 193, 128, 39, 4, 17
1, 128, 32, 247, 161, 14Ø, 136,
39, 7, 134, 21, 183, 126, 2834
6Ø DATA  15Ø, 32, 128, 57, 246,
255, 1Ø5, 196, 16, 39, 249, 183,
 255, 1Ø4, 57, 182, 255, 1Ø5, 13
2, 32, 38, 4Ø, 182, 255, 1Ø5, 33
98
7Ø DATA  132, 8, 39, 242, 182, 2
55, 1Ø4, 57, 182, 255, 1Ø5, 132,
 8, 39, 4, 182, 255, 1Ø4, 57, 18
2, 255, 1Ø5, 132, 32, 38, 3Ø86
8Ø DATA  11, 134, Ø, 51, 65, 17,
 131, Ø, 255, 38, 228, 57, 134,
24, 183, 127, 254, 32, 19Ø, 5Ø,
126, Ø, 21Ø7
14Ø CLS:PRINT@2ØØ,"NOW POKING CO
DE"
15Ø CLEAR2Ø,&H7BFE:ST=&H7E84:C=Ø
16Ø FOR Y=1 TO 7
17Ø FOR X=1 TO 25
18Ø GOSUB 4ØØ
19Ø NEXT X
2ØØ GOSUB 5ØØ
21Ø NEXT Y
22Ø Y=8:FOR X=1 TO 22
23Ø GOSUB 4ØØ
24Ø NEXT X
25Ø GOSUB 5ØØ
26Ø CLS
27Ø PRINT"INSERT DISK TO RECEIVE
 FILE IN"
28Ø INPUT"DRIVE Ø AND PRESS ENTE
R";A$
29Ø SAVEM"XMRECV/BIN",&H7E84,&H7
F48,&H7EØØ
3ØØ PRINT"FILE HAS NOW BEEN SAVE
D"
31Ø END
32Ø STOP
4ØØ READ N:POKE ST,N
41Ø C=C+N:ST=ST+1
42Ø PRINT @Ø,N
43Ø RETURN
5ØØ READ N
51Ø IF N<>C THEN PRINT "ERROR IN
 LINE #";(Y*1Ø):STOP
52Ø C=Ø:RETURN
```

```
30 .....128   1250 .....250   1530 .....166
112 .....165  1320 .....102   9210 .....123
610 .....236  1380 .....108   9620 .....148
1005 .....233 1460 .....67    END .....131
1217 .....119
```

**Listing 5:** XMSEND.SYS

```
Ø 'XMSEND.SYS V2.1
1 'COPYRIGHT 1986 BY JOHN GRUBB
2 'PROGRAM TO ALLOW XMODEM DOWNL
OADS
3 'FROM THE COBBS BBS SYSTEM.
4 'MUST USE XMSEND/BIN WITH THIS
 PROGRAM.
5 ON ERR GOTO 3Ø
1Ø CLEAR15ØØØ,&H7DFF
11 DIM BC$(21),L$(8Ø),TY$(21),TX
$(21),D$(21),B$(1ØØ),KY$(21):NU$
=CHR$(Ø):DR$(Ø)="Ø":DR$(1)="1":D
```

```
R$(2)="2":DR$(3)="3"
12 DEFUSRØ=&HØEDØ:DEFUSR1=&HØED3
:DEFUSR2=&HØE81:DEFUSR3=&H7EØØ:O
N ERR GOTO3Ø:GOSUB95ØØ:GOSUB25:G
OTO9ØØ
25 '
26 IFPEEK(4658)=ØTHEN28 ELSE CD=
PEEK(65385):CD=CD AND 32:IF CD <
>Ø OR PEEK(4657)<>Ø THEN 27 ELSE
 28
27 CLOSE:POKE65387,54:POKE65386,
1Ø7:FORT=1TO1ØØ:NEXTT:TR$=TR$+"L
OC":GOSUB9615:CLEAR2ØØ,&H7FFF:LO
AD"USER.STM",R
28 II$=INKEY$:IFII$=""THEN29ELSE
CH$=II$:K=INSTR("^_ ]",II$):IFK=
ØTHEN29ELSE ON K GOSUB 8ØØ,31,71
3Ø,98ØØ
29 RETURN
3Ø PRINT:PRINT"Unable to ACCESS.
 Returning to Main System..":GOT
O1ØØØØ
31 RETURN
1ØØ '
1Ø1 DC=VAL(HEX$(PEEK(&HØEFD))):H
R=VAL(HEX$(PEEK(&HØEFE))):MN=VAL
(HEX$(PEEK(&HØEFF))):SS=VAL(HEX$
(PEEK(&HØFØØ))):HR$=RIGHT$(STR$(
HR),2):IFHR<1ØTHEN MID$(HR$,1,1)
="Ø"
1Ø4 MN$=RIGHT$(STR$(MN),2):IFMN<
1ØTHEN MID$(MN$,1,1)="Ø"
1Ø5 TI$=HR$+":"+MN$:IF SS<54ORMN
>58THEN1Ø8
1Ø6 MN=MN+1:IFMN>59 THENMN=Ø:HR=
HR+1:IF HR>23 THENHR=Ø
1Ø7 X=USR1(HR*256+MN)
1Ø8 X=PEEK(4611):IFX<>DC THEN111
1Ø9 DA$=RIGHT$(STR$(PEEK(46Ø8)),
2)+"/"+RIGHT$(STR$(PEEK(46Ø9)),2
)+"/"+RIGHT$(STR$(PEEK(461Ø)),2)
11Ø GOTO118
111 MM=PEEK(46Ø8):DA=PEEK(46Ø9):
YY=PEEK(461Ø):DA=DA+1:IFDA>31THE
NDA=1:MM=MM+1:IF MM>12 THEN MM=1
:YY=YY+1
112 POKE46Ø8,MM:POKE46Ø9,DA:POKE
461Ø,YY:POKE4611,DC:GOTO1Ø9
118 AX=PEEK(4615)*6Ø+PEEK(4616):
PT=HR*6Ø+MN:IFF3=1THEN124ELSEUO=
PEEK(4619):IFPT-AX<(UO*5)-5 OR U
O=255 THEN121
119 TØ=PEEK(4619)*5:T1=TØ-(PT-AX
):IFT1<1THEN T1=Ø:GOTO12Ø ELSE P
RINT"You only have";T1;"Minutes
left!":GOTO121
12Ø PRINT"No time left!":TR$=TR$
+"TIMED OUT "+TI$:GOSUB9615:GOTO
982Ø
121 '
124 RETURN
15Ø '
152 F=ASC(F$):E=128:F$=""
154 FOR Q=1 TO 8
156 J=INT(F/E)
158 IF J=Ø THEN F$=F$+"Ø"ELSEF$=
F$+"1"
16Ø F=F-(E*J):E=E/2
162 NEXT Q
166 RETURN
6ØØ '
6Ø3 TIMER=Ø
6Ø4 GOSUB25:ON ERR GOTO 117Ø
6Ø5 EXEC&H1ØDA:CH$=CHR$(PEEK(448
1)):IC$=INKEY$:IFIC$<>""THEN CH$
=IC$:GOTO615
6Ø9 IF TIMER>4ØØØTHEN PRINT:PRIN
T:PRINT"You timed out!!":TR$=TR$
+"KTO":GOSUB9615:GOTO982Ø
61Ø IFCH$=CHR$(Ø)THEN6Ø4
615 RETURN
655 GOSUB25:ON ERR GOTO 117Ø:LIN
EINPUTCH$:GOSUB25:RETURN
675 GOSUB655:G1$="":IFCH$=""THEN
RETURN
68Ø FOR G=1 TO LEN(CH$)
685 G1=ASC(MID$(CH$,G,1)):IFG1>9
6ANDG1<123THEN G1=G1-32
69Ø G1$=G1$+CHR$(G1):NEXTG:CH$=G
1$:RETURN
8ØØ RETURN
85Ø '
855 POKE&HØ16B,197:POKE&HØ16C,PE
EK(4684):RETURN
875 POKE&HØ168,PEEK(4681):POKE&H
Ø169,PEEK(4682):RETURN
885 POKE&HØ168,&H1Ø:POKE&HØ169,&
HE6:RETURN
9ØØ B=PEEK(&H7EØØ):TD=PEEK(&H7EØ
1):ZK=PEEK(&H7EØ2):ZD=PEEK(&H7EØ
3)
9Ø5 D$="":A$="":FORX=&HØ TO &H3:
D=PEEK(&H7EØ4+X):A$=CHR$(D):D$=D
$+A$:NEXT X
1ØØØ '
1ØØ5 GOSUB25:ON ERR GOTO 1175
1Ø1Ø '
1Ø15 '
1Ø2Ø GOTO12ØØ
117Ø '
1175 PRINT"System Error!, Wait..
.";:PRINTCHR$(7);
118Ø ER=PEEK(&HFD):EL=PEEK(&HFE)
*&H1ØØ+PEEK(&HFF)
1181 IF ER=>54 THEN EA=&HC242+ER
:GOTO1185
1182 IF ER=>5Ø THEN EA=&H88D9+ER
:GOTO1185
```

```
1183 EA=&HABAF+ER
1185 ER$=CHR$(13)+"***ERROR TYPE
 "+CHR$(PEEK(EA))+CHR$(PEEK(EA+1
))+" IN LINE"+STR$(EL)+"***":PRI
NTER$:GOTO12ØØ
12ØØ ON ERR GOTO 1229:GOSUB885:P
RINTCHR$(7):IFTD>2THENPRINT:PRIN
T"File to D/L: ";:GOTO1215
12Ø6 IF D9=Ø THEN D9=1:CH$="M":G
OTO1225
121Ø PRINT:GOSUB1ØØ:PRINT"[M]enu
,<CR> to Exit or":PRINT"# to Dow
nload: ";:FT$="":F$=""
1215 GOSUB675:ONERR GOTO1229:IFC
H$=""THEN D9=Ø:GOTO1ØØØØELSEFT$=
CH$:IFTD<3THENIFLEN(CH$)>4THEN12
ØØELSE122Ø
1216 IFLEFT$(CH$,3)<>"DIR"THENF$
=CH$:GOTO1226ELSE D=VAL(RIGHT$(C
H$,1)):IF TD<4 THEN D=ZD
1217 IFD=1THEN DIR1:GOTO1219ELSE
IFD=2THENDIR2:GOTO1219
1218 IF D=ØTHEN DIRØ ELSE DIR3
1219 PRINT"Free: ";FREE(D):GOTO1
2ØØ
122Ø GOSUB25:IFCH$<>"M"THEN123Ø
1225 FT$="DOWN"+D$+"/MNU:":D=-1:
GOSUB1245:GOTO121Ø
1226 IFTD=3THEN D=ZD ELSEPRINT"D
RIVE: ";:GOSUB6ØØ:ON ERR GOTO12Ø
Ø:D=VAL(CH$):IFD>3THEN1226ELSEPR
INTD
1227 IFZK>Ø THEN X$=RIGHT$(F$,4)
:IFX$="/SYS"ORX$="/BIN"THEN12ØØ
1228 F$=F$+":"+DR$(D):ONERR GOTO
129Ø:GOTO123Ø
1229 GOTO1175
123Ø CLS:PRINT"1 - ASCII, No Buf
fer":PRINT"2 - ASCII, With Buffe
r":PRINT"3 - Xmodem D/L":PRINT"P
ress <CR> to exit"
1235 GOSUB6ØØ:ONERR GOTO12ØØ:X=V
AL(CH$):B=X-1:IFX=ØTHENRETURNELS
EIFX>ØORX<4THENPRINTTAB(3)CH$ELS
E1235
1237 IFTD>3THEN1255
124Ø FT$=D$+FT$+"/DOW:":D=-1
1245 ON ERR GOTO1245
125Ø IFTD=3THEN129ØELSED=D+1:IFD
>3THEN129ØELSE F$=FT$+DR$(D)
1255 CLOSE:UNLOAD:ONERR GOTO125Ø
:OPEN"I",#1,F$:ONERR GOTO129Ø:PR
INTCHR$(12):CLS:IFCH$="M"THEN127
Ø
1257 IFX=3THEN 13ØØ
126Ø IF B=Ø THENPRINT"Open Buffe
r.....":PRINTCHR$(7):FOR O =1 TO
 15ØØ:NEXTO
1265 IF B=1 THENPRINTCHR$(18);
127Ø IFEOF(1)THEN1275ELSEGOSUB25
:LINEINPUT#1,A$:PRINTA$:EXEC4314
:CH=PEEK(4481):IFCH=83ORCH=115OR
INKEY$="S"THEN1275ELSE127Ø
1275 ONERRGOTO12ØØ:IFCH$="M" THE
N 128ØELSEIF B=1 THENPRINTCHR$(2
Ø)ELSEFORO=1TO15ØØ:NEXTO
128Ø CLOSE:TR$=TR$+CHR$(13)+"DOW
: "+F$+CHR$(13):GOSUB961Ø:GOTO12
ØØ
129Ø ON ERR GOTO12ØØ:PRINTCHR$(7
);:PRINT"Unable to access.":PRIN
T:GOTO12ØØ
13ØØ LOADM"XMSEND/BIN":ON ERR GO
TO 1625
131Ø CLS:PRINTCHR$(12):PRINT"CoB
BS Xmodem Downloader V2.1":PRINT
"By John Grubb":PRINT"Copyright
1986"
1315 PRINT:PRINT"1. Continue wit
h Download"
132Ø PRINT"2. Return to CoBBS"
1325 PRINT"Comand>>";
133Ø GOSUB6ØØ
1335 IF CH$<"1"ORCH$>"2"THEN133Ø
ELSEPRINTCH$
134Ø IF CH$="2" THEN CLOSE:UNLOA
D:GOTO1ØØØØ
1345 ON ERR GOTO 12ØØ
135Ø CLOSE:OPEN"D",#1,F$,128:FIE
LD#1,128 AS R$:PF=Ø:RD=Ø:BL=Ø:BC
=Ø
1355 PRINT"Loading program for b
lock count.."
136Ø GOSUB154Ø:PRINT TB;"Blocks
to send."
1365 PRINT:PRINT"Continue with d
ownload? (Y/N)";
137Ø ON ERR GOTO 1175: GOSUB6ØØ:
IFCH$=""THEN137ØELSEIFCH$="Y"OR
CH$="y"THEN PRINT"YES!":GOTO1375
 ELSE PRINT"NO":CLOSE:GOTO12ØØ
1375 ONERRGOTO1625:PRINTCHR$(12)
:PRINT"Ready to transmit.":PRINT
"On MIKEY TERM press":PRINT" <DO
WNARROW><4>.":PRINT"Begin XMODEM
 TRANSMISSION":GOSUB25:GOSUB16Ø5
:GOSUB1415:IF RD THEN GOSUB144Ø:
PRINT"<NAK> not recived!":GOTO13
1Ø ELSE1385
138Ø GOSUB154Ø
1385 GOSUB875:CLS2:FOR BV=1TOBL
1386 LOCATE1Ø,1Ø:PRINT"Blocks le
ft to send";(TB-BC);:'FOR COCO I
II USE THIS
1387 REM PRINT@33,"BLOCKS LEFT T
O SEND";(TB-BC);:'FOR COCO II US
E THIS
1388 GOSUB 1445
139Ø POKE 1Ø24,BC:LPOKE&H6ØØØØ,B
C:NEXTBV:'FOR COCO II, DELETE TH
E LPOKE STATEMENT.
1395 BL=Ø:IFLB=Ø THEN138Ø
14ØØ GOSUB1485
14Ø5 GOSUB144Ø
```

```
141Ø CLOSE:UNLOAD:GOSUB885:FORX=
1TO5:PRINTCHR$(7);:NEXT X:GOTO12
ØØ
1415 GOSUB25:X=Ø:RD=Ø
142Ø E=PEEK(65385):F=E AND 8
1425 IF F=Ø THEN 1435
143Ø IF PEEK(65384)<>21 THEN1435
 ELSERETURN
1435 X=X+1:IF X<1ØØØ THEN 142Ø
144Ø POKE&HFF6B,PEEK(&HFF6B)OR&H
2Ø:POKE&HFF6A,PEEK(&HFF6A) OR &H
6Ø:RD=1:RETURN
1445 GOSUB25:BC=BC+1:POKE&H7F1B,
BC
145Ø A=USR3(VARPTR(B$(BV)))
1455 IF A=1 THEN TR$=TR$+"XMODEM
 STRING ERROR":GOSUB9615:GOSUB16
2Ø:GOTO141Ø
146Ø IF A=2 THEN TR$=TR$+"COMMUN
ICATIONS FAILURE! - MODEM OR RS2
32 PAK":GOSUB9615:GOSUB162Ø:GOTO
141Ø
1465 IF A=3 THEN TR$=TR$+"XMODEM
 TIME OUT.":GOSUB9615:GOSUB162Ø:
GOTO141Ø
147Ø IF A=4 THEN TR$=TR$+"DOWNLO
AD - 6 RETRIES ATTEMPTED":GOSUB9
615:GOSUB162Ø:GOTO141Ø
1475 IF A<>Ø THEN TR$=TR$+"FATAL
 ERROR":GOSUB9615:GOSUB162Ø:GOTO
12ØØ
148Ø RETURN
1485 D=4:GOSUB1495:T=Ø
149Ø GOSUB1525:T=T+1:IF D=6 THEN
GOTO144ØELSEIFT<2ØØ THEN 149ØELS
E144Ø
1495 T=Ø
15ØØ E=PEEK(65385)
15Ø5 E=E AND 16
151Ø IF E THEN POKE 65384,D:RETU
RN ELSET=T+1
1515 IF T<1ØØØ THEN 15ØØ
152Ø GOTO 144Ø
1525 E=PEEK(65385):F=E AND 8
153Ø IF F THEN D=PEEK(65384): EL
SE D=Ø
1535 RETURN
154Ø TB=LOF(1)+1:LB=Ø
1545 PF=PF+1
155Ø IF PF>LOF(1) THEN 1575
1555 BL=BL+1:GET#1,PF
156Ø B$(BL)=R$
1565 IF BL=1ØØ THEN RETURN
157Ø GOTO1545
1575 MF=(PF-1)*128:LB=1
158Ø CLOSE:OPEN"D",#1,F$,1:FIELD
#1,1 AS R$
1585 BL=BL+1:B$(BL)=""
159Ø MF=MF+1:IF MF<=LOF(1) THEN
GET#1,MF:B$(BL)=B$(BL)+R$:GOTO15
9Ø
1595 IF LEN(B$(BL))<128 THENB$(B
L)=B$(BL)+" ":GOTO1595
16ØØ CLOSE:RETURN
16Ø5 POKE&HFF6B,PEEK(&HFF6B) AND
 &H9F:POKE&HFF6A,PEEK(&HFF6A) AN
D &H9F
161Ø RETURN
162Ø GOSUB144Ø:PRINT"XMODEM ERRO
R":RETURN
1625 GOSUB144Ø:GOTO12ØØ
713Ø RETURN
92ØØ '
92Ø5 F$="USERL.SYS:"+DR$(PEEK(46
72))
921Ø OPEN"D",#1,F$,96
9215 FIELD#1,5Ø AS UN$,8 AS UP$,
1 AS UR$,1 AS UA$,1 AS U1$,1 AS
U2$,1 AS UU$,1 AS UE$,5 AS U5$,5
 AS UM$,5 AS UD$,1 AS U3$,1 AS U
4$,1 AS UO$,1 AS UL$,4 AS US$,9
AS SP$
922Ø K1=LOF(1):RETURN
95ØØ '
951Ø GOSUB92ØØ:GET#1,1
952Ø K=INSTR(UN$,CHR$(Ø)):NA$=LE
FT$(UN$,K-1):PR=ASC(UA$):F$=U1$:
GOSUB15Ø:P1$=F$:F$=U2$:GOSUB15Ø:
P2$=F$:UL=ASC(UL$):IF UL<1 OR UL
>4 THENUL=1
955Ø BC=ASC(UE$):LM=CVN(UM$):POK
E4619,ASC(UO$):POKE4628,UL:POKE4
618,BC:POKE462Ø,PR:POKE4621,ASC(
U1$):POKE4622,ASC(U2$):CLOSE:RET
URN
961Ø IFLEN(TR$)<64THENRETURN
9615 FR=PEEK(4669):ONERR GOTO 96
7Ø:IFFR=ØTHEN9635ELSEIFFR=1THEN9
64ØELSEIFFR=3THEN966ØELSECLOSE:F
$="TRACER.SYS:"+DR$(PEEK(4675)):
OPEN"D",#1,F$,128
9616 FR=FREE(PEEK(4675)):IFFR<3T
HENCLOSE:RETURN
962Ø FIELD#1,128 AS X$:K1=LOF(1)
:K1=K1+1:LSET X$=TR$+CHR$(Ø):PUT
#1,K1
9635 CLOSE:TR$="":RETURN
964Ø OPEN"O",-1,"TRACER/SYS":PRI
NT#-1,TR$:GOTO9635
966Ø PT=PEEK(&HFF22)AND1:IFPT=1T
HEN9635ELSEPRINT#-2,TR$:GOTO9635
967Ø POKE4669,Ø:GOTO1ØØØ
982Ø CLS:PRINT:PRINT"Thanks for
calling":PRINT"The Gallipolis Co
BBS..."
9825 PRINT:CLEAR2ØØ,&H7FFF
983Ø POKE4615,HR:POKE4616,MN:POK
E4617,SS
984Ø PRINT"Please hang up now.":
POKE65386,1Ø6:LOAD"USER.STM",R
1ØØØØ CLEAR2ØØ,&H7FFF:PRINTCHR$(
12):PRINT:PRINT:PRINT:PRINT"Load
ing Main System... Please Wait":
LOAD"COBBS.STM",R
```

**Listing 6:** XMSNDPK.BAS

```
Ø 'XMSNDPK.BAS V2.1
1 'COPYRIGHT 1986 BY JOHN GRUBB
2 'THIS ROUTINE POKES THE
3 'MACHINE CODE FOR THE
4 'XMSEND/BIN ROUTINE.
1Ø DATA  16, 239, 141, 1, 27, 18
9, 179, 237, 31, 2, 23Ø, 164, 17
4, 34, 193, 128, 16, 38, Ø, 235,
 95, 111, 141, 1, 3, 2625
2Ø DATA  134, 1, 141, 92, 166, 1
41, Ø, 25Ø, 141, 86, 136, 255, 1
41, 82, 95, 2Ø6, Ø, Ø, 239, 141,
 Ø, 234, 166, 128, 141, 3116
3Ø DATA  7Ø, 52, 4, 52, 2, 79, 5
2, 2, 236, 141, Ø, 219, 227, 225
, 237, 141, Ø, 213, 53, 4, 92, 1
93, 128, 39, 2, 2463
4Ø DATA  32, 226, 166, 141, Ø, 2
Ø1, 141, 38, 141, 1Ø5, 129, 6, 3
8, 9, 111, 141, Ø, 191, 79, 95,
22, Ø, 16Ø, 48, 136, 2356
5Ø DATA  128, 1Ø8, 141, Ø, 179,
52, 2, 166, 141, Ø, 173, 129, 6,
 16, 44, Ø, 159, 53, 2, 32, 16Ø,
 52, 2, 52, 64, 1861
6Ø DATA  2Ø6, Ø, Ø, 239, 141, Ø,
 154, 111, 141, Ø, 149, 53, 64,
182, 255, 1Ø5, 132, 16, 39, 6, 5
3, 2, 183, 255, 1Ø4, 259Ø
7Ø DATA  57, 52, 16, 174, 141, Ø
, 129, 48, 1, 175, 141, Ø, 123,
39, 4, 53, 16, 32, 225, 52, 4, 2
3Ø, 141, Ø, 11Ø, 1963
8Ø DATA  92, 193, 3, 39, 86, 231
, 141, Ø, 1Ø1, 53, 4, 53, 16, 32
, 2Ø4, 52, 64, 2Ø6, Ø, Ø, 239, 1
41, Ø, 87, 111, 2148
9Ø DATA  141, Ø, 82, 53, 64, 182
, 255, 1Ø5, 132, 8, 39, 4, 182,
255, 1Ø4, 57, 52, 16, 174, 141,
Ø, 64, 48, 1, 175, 2334
1ØØ DATA  141, Ø, 58, 39, 4, 53,
 16, 32, 227, 52, 4, 23Ø, 141, Ø
, 45, 92, 193, 21, 44, 26, 231,
141, Ø, 36, 53, 1879
11Ø DATA  4, 53, 16, 32, 2Ø6, 79
, 198, 1, 16, 238, 141, Ø, 25, 1
26, 18Ø, 244, 2Ø4, Ø, 2, 32, 243
, 2Ø4, Ø, 3, 32, 2279
12Ø DATA  238, 2Ø4, Ø, 4, 32, 23
3, Ø, Ø, Ø, Ø, Ø, Ø, Ø, Ø, Ø, 711
13Ø CLS:PRINT @2ØØ,"NOW POKING C
ODE"
14Ø CLEAR2Ø,&H7DFF:ST=&H7EØØ:C=Ø
15Ø FOR Y=1 TO 11
16Ø FOR X=1 TO 25
17Ø GOSUB 4ØØ
18Ø NEXT X
19Ø GOSUB 5ØØ
2ØØ NEXT Y
21Ø Y=12:FOR X=1 TO 14
22Ø GOSUB 4ØØ
23Ø NEXT X
24Ø GOSUB 5ØØ
25Ø CLS
26Ø PRINT"INSERT DISK TO RECEIVE
 FILE IN"
27Ø INPUT"DRIVE Ø AND PRESS ENTE
R";A$
28Ø SAVEM "XMSEND/BIN",&H7EØØ,&H
7F2Ø,&H7EØØ
29Ø PRINT"FILE HAS NOW BEEN SAVE
D"
3ØØ END
31Ø STOP
4ØØ READ N:POKE ST,N
41Ø C=C+N:ST=ST+1
42Ø PRINT @Ø,N
43Ø RETURN
5ØØ READ N
51Ø IF N<>C THEN PRINT "ERROR IN
 LINE #";(Y*1Ø):STOP
52Ø C=Ø:RETURN
```

**Listing 7:** FCONV.BAS

```
1Ø CLEAR 1ØØØ
2Ø CLS:PRINT"CHANGE DISK FILETYP
E"
3Ø PRINT"INSTRUCTIONS? (Y/N) ";:
LINEINPUT Z$:IF Z$="Y" THEN GOSU
B 46Ø
4Ø LINEINPUT"FILENAME :";F1$
5Ø LINEINPUT"     EXT :";F2$
6Ø LINEINPUT"     DRV :";DRV$:X=
VAL(DRV$)
7Ø IF F1$="" AND F2$="" AND DRV$
="" THEN 45Ø
8Ø IF F1$="" THEN DIR X:GOTO4Ø
9Ø FORZ=3 TO 11
1ØØ DSKI$X,17,Z,A$,B$
11Ø A$=A$+LEFT$(B$,127)
12Ø FORK=Ø TO 7
13Ø PT=K*32
14Ø NA$=MID$(A$,PT+1,13)
15Ø IF LEFT$(NA$,1)=CHR$(Ø) THEN
```

```
 2ØØ
16Ø IF LEFT$(NA$,1)=CHR$(&HFF) T
HEN PRINT"FILE NOT FOUND!":GOTO4
Ø
17Ø EXT$=MID$(NA$,9,3)
18Ø X$=RIGHT$(NA$,2):B1=ASC(LEFT
$(X$,1)):B2=ASC(RIGHT$(X$,1))
19Ø IF F1$=LEFT$(NA$,LEN(F1$)) A
ND F2$=EXT$ THEN GOTO22Ø
2ØØ NEXTK
21Ø NEXTZ
22Ø CLS:PRINTCHR$(12):PRINT:PRIN
TLEFT$(NA$,11)
23Ø PRINT"THIS IS A ";
24Ø IF B1=1 AND B2=255 THEN PRIN
T"ASCII DATA FILE"
25Ø IF B1=Ø AND B2=Ø THEN PRINT"
BINARY BASIC FILE"
26Ø IF B1=Ø AND B2=255 THEN PRIN
T"ASCII BASIC FILE"
27Ø IF B1=2 AND B2=Ø THEN PRINT"
MACHINE LANG. FILE"
28Ø PRINT:PRINT"CONVERT THIS TO.
.."
29Ø PRINT"1. ASCII DATA"
3ØØ PRINT"2. BINARY BASIC"
31Ø PRINT"3. ASCII BASIC"
32Ø PRINT"4. MACHINE LANG."
33Ø PRINT:LINEINPUT">";Z$
34Ø IF Z$<"1" OR Z$>"4" THEN 28Ø
35Ø IF Z$="1" THEN X$=CHR$(1)+CH
R$(&HFF)
36Ø IF Z$="2" THEN X$=CHR$(Ø)+CH
R$(Ø)
37Ø IF Z$="3" THEN X$=CHR$(Ø)+CH
R$(&HFF)
38Ø IF Z$="4" THEN X$=CHR$(2)+CH
R$(Ø)
39Ø LINEINPUT"SURE? (Y/N)";Z$:IF
 Z$<>"Y" THEN 45Ø
4ØØ N1$=LEFT$(NA$,11)+X$
41Ø MID$(A$,PT+1,13)=N1$
42Ø C$=LEFT$(A$,128):D$=RIGHT$(A
$,127)+CHR$(Ø)
43Ø DSKO$X,17,Z,C$,D$
44Ø GOTO 4Ø
45Ø PRINT"1. EXIT TO DOS":PRINT"
2. RESTART":LINEINPUT">";Z$:IF Z
$="1" THEN END ELSE GOTO1Ø
46Ø PRINT:PRINT"THIS PROGRAM WIL
L ALLOW YOU TO"
47Ø PRINT"CHANGE THE DIRECTORY T
YPE OF"
48Ø PRINT"XMODEM FILES THAT HAVE
 BEEN UP-"
49Ø PRINT"LOADED TO COBBS! WHEN
THIS PRO-"
5ØØ PRINT"GRAM ASKS FOR THE FILE
NAME GIVE"
51Ø PRINT"ONLY THE FILENAME! YOU
 WILL BE"
52Ø PRINT"PROMPTED FOR THE EXTEN
SION AND"
53Ø PRINT"DRIVE #. TO EXIT THIS
PROGRAM"
54Ø PRINT"JUST PRESS <ENTER> AT
THE FILE-"
55Ø PRINT"NAME, EXT, AND DRV PRO
MPTS"
56Ø PRINT:PRINT
57Ø LINEINPUT"PRESS <ENTER>...";
ZZ$
58Ø CLS
59Ø PRINT"TO TAKE A DIR ON A DRI
VE, PRESS"
6ØØ PRINT"THE ENTER KEY IN RESPO
NSE TO "
61Ø PRINT"THE FILENAME AND THE E
XT"
62Ø PRINT"PROMPTS. THEN PRESS TH
E # OF"
63Ø PRINT"THE DRIVE ON WHICH YOU
 WISH TO"
64Ø PRINT"SEE A DIRECTORY."
65Ø PRINT:PRINT
66Ø RETURN
```


HAWKSoft HAWKSoft HAWKSoft HAWKSoft HAWKSoft

DOMINATION.....$18.00
MULTI-PLAYER STRATEGY GAME!
Try to take over the planet of YCNAN. Battle other players armies to take control of their provinces and defend yours. Play on a Hi-res map of the planet. Take the "RISK" and be a planet-lord today!!! Requires Coco 3 1 disk and joystick or mouse. See Rainbow Review JULY 88

MYDOS.....$15.00
CUSTOMIZABLE! EPROMABLE!!
The commands Tandy left out!
MYDOS is an enhancement to Disk Extended Basic 2.1 on the CoCo 3. One command loadm and execute for M/L programs. Lowercase command entry and display on ALL screens. Screen echo and SAY command for RS Speech Pak. Point and click mouse directory.
NEW FEATURES!!!!!
Supports double-sided and 40 track drives. Set any palettes you want on power-up (RGB or CMP). Power-up in any screen width and colors (or monochrome) you wish! More options than you can shake a joystick at!!! See Rainbow Review JUNE 87

HAWKSoft KEYBOARD CABLE.....$25.00
UNCHAIN YOUR KEYBOARD!
Five foot extender cable for Coco II and 3. Move your keyboard where you want it! Installation instructions and tips included! Custom lengths availiable.

HAWKSoft P.O. Box 7112
Elgin, Il. 60121-7112
312-742-3084

S&H always included. Il. orders add 7% sales tax. Checks Money-orders or COD No credit cards.

# <<< GIMMESOFT >>>

A new generation of Color Computer products

## MAXSOUND

### A High Quality Digital Audio Sampler and Sequencer

**Turn your CoCo III into a REAL digital audio sampler with HIGH quality audio reproduction. Easily add exotic effects, ECHO, stuttering, speed shifting, sequencing, and reverse audio to BASIC or ML programs or GRAPHICS! Now includes Data Compression. Imagine recording any Voice, Music, or Sound effect and being able to use these DIGITAL recordings in your own programs! 3 disk sides includes: INTERFACT/BIN - ML driver for sound effects. G&M/BAS - Adds sound effects to Graphics. SHOWTIME and DEMO disks. SCOPE/BAS - Turns CRT into a Digital Oscilloscope to look at MAXSOUND waveforms. Version 3.0 upgrade ..... $6.95 + Shipping & Handling**

***"Maxsound...bringing a new era to the CoCo Community"***
**-Cray Augsburg, June '88 Rainbow Review**

**CALL TO HEAR 'OVER THE PHONE' DEMO (128k or 512k CoCo III only) ..... $59.95**

NEW

## Maxsound Soundtracks & Graphics

**These exciting disks are samples of what can be created with MAXSOUND and CoCo Max III! Some work on 128k, some work without the MAXSOUND program and some are 512k 4 disk sides of unbelievable sounds and graphics! Just some of the titles are: Airwolf, Star Trek, Knight Rider, Warrior King Demo, Probe, and more are in the making! Prices range from just $5.95 to $9.95 Call or write for a complete catalog of titles available!**

## V-Term Terminal Emulator

### Communicate with VAX, UNIX, Mainframe, and BBS Systems!

**FEATURES:**

- **-VT-100, VT-52, Vidtex (includes RLE graphics display), and standard CRT emulations.**
- **-Developed and tested on a UNIX system using the EMACS and VI full-screen editors.**
- **-All 128 ASCII characters accessible from the keyboard.**
- **-Uses a high-resolution graphics screen to implement a highly readable 80-column screen.**
- **-Menus can be operated concurrently with other terminal functions. (Disk Basic!)**
- **-Full 28 line by 80 column screen, with 3 bottom lines protected for menus.**
- **-Serial port up to 2400 baud, RS-232 Pak up to 9600 baud, DCModem Pak at 300 baud.**
- **-XModem, XModem-CRC, Y-Modem, and ASCII file transfers directly to disk or memory.**
- **-Prints disk or buffer files with settable margins, baud rate and word wrap.**
- **-Full 128k or 512k support with a RAMDISK like buffer. Monochrome monitor support.**
- **-Capture buffer, Snapshot, Conference mode, 35/40/80 Tracks, and over 56 pages of docs!**

**Version 02.00.00 upgrade ..... $6.95 + S&H Disk (128k or 512k CoCo III only) ..... $39.95**

## Toll Free 1-800-441-GIME Order Line

**Technical assistance: 7pm to 9pm**
**Orders: 9am to 9pm Eastern time**
**On-line orders and up to date information: Delphi's CoCo Sig**

**GIMMESOFT**
**P.O. Box 421**
**Perry Hall, MD 21128**
**301-256-7558 or 301-256-2953**

**Add $3.00 for shipping and handling**
**Add $2.50 for COD (USA only)**
**MD residents add 5% sales tax**
**VISA/MC/Check/Money Order/COD**

VISA

# <<< GIMMESOFT >>>

MasterCard

A new generation of Color Computer products

**GRAPHICS-25** (512k CoCo III only) **Great with MAXSOUND and/or CoCo Max III!**
Utilize the FULL 512k memory range of your CoCo III from BASIC for graphics! Create up to 25 ONBOARD HIRES SCREENS! Six new BASIC commands allow instant display switching while secretly drawing other screens. Save and load screens to and from disk. Copy one screen to another. Fast Graphics action, Smooth animation, and 100% Machine Language code. Requires DECB 1.0, DECB 1.1, or FKEYS III. Complete with documentation. Disk ..... $24.95

NEW **MAX-10** (CoCo III only) The dazzling Word Processor and document creator for the CoCo III! MAX-10 is the perfect partner for CoCo MAX III! Mix graphics and text to get great looking newsletters, flyers, ect... Includes Spelling checker! Requires Joystick. (CoCo Max III owners deduct $10) SALE .... $74.95

**CoCo Max III** (CoCo III only) See April '88 review. Built in Animation! / Amazing Color Sequencing!!! Comes with Hi-Res Interface, MINILOAD/BAS, Demo Disk, CoCo Show Pgm. Requires Joystick or mouse. SALE .... $74.95

**MULTI-LABEL III** (CoCo III only) See July '87 review. An easy to use, versatile label creating program including many new CoCo III features. Print multiple fonts on each label! This one's a MUST for the CoCo III!! Disk .... $16.95

**FKEYS III** (CoCo I/II/III) See April '87 review. A user friendly, programmable function key utility that creates up to 20 function keys. EDITOR, DOS mods, Single or Double sided, 35/40 tracks, DISABLE, and it's EPROMable!. Disk .. $19.95

**SIXDRIVE** (CoCo I/II/III) This machine language utility modifies DECB 1.0, 1.1, FKEYS III, or ADOS to allow the use of 3 double-sided drives (or 2 D/S drives and **J&R's RAMDISKS**) as 6 S/S drives. Disk ..... $16.95

**AUTO DIM** (CoCo III only) See Jan. '88 review. This hardware device protects your monitor, or TV from IMAGE BURN after a few minutes of inactivity from your keyboard. Illustrated and easy to install. Hardware ..... $29.95

**MPI-CoCo Locking Plate** (CoCo III only) See Sept '88 review. Protects your CoCo III and Multi Pak Interface from destroying each other! Please specify MPI number 26-3024 or 26-3124 when ordering! SALE ..... $7.95

NEW **Warrior King** (CoCo III only) Become Rastann, Warrior King, on the quest to regain his rightful crown hidden deep within a sinister land. Battle monsters, gain magic & weapons, and travel thru harsh wilderness & dark castle dungeons in this medieval realm. From the creator of Kung-Fu Dude comes this awesome arcade game for the CoCo III! Uses the most detailed 320 x 200 16 color graphics & high speed ML code to vault you into a world of fantasy! Dare ye challange the many perils ahead to become Warrior King? Requires 128k CoCo III, Disk drive, and Joystick .... $29.95

**HALL OF THE KING TRILOGY** (CoCo I/II/III) See June '86 & Nov '87 reviews. The epic adventure is back! The largest adventure campaign ever seen for the CoCo is again available. A total of 6 DISK SIDES of intense graphics adventure will have you playing for weeks! Each section is a 2 disk stand alone adventure, but all 3 together form an epic saga! Quest for the legendary Earthstone in the ancient dwelling of the dwarves while you enjoy the classic graphics that made this trilogy famous! Each adventure can be purchased separately for only $29.95, the lowest price ever, or you can SAVE and purchase the entire set for only $74.95. Requires 64k, Disk drive, (and composite monitor for the CoCo III). Please specify HALL of the King I, II, or III ..... $29.95 each or the entire 6 DISK Trilogy for only ..... $74.95

***In Quest of the Star Lord*** (CoCo III only) See Aug '88 review. This is **THE** graphics adventure for the CoCo III! Unparalleled 320 x 200 animated graphics will leave you gasping for more! You quest for the Phoenix Crossbow in this post-holocaust world of science and fantasy. Full **4 Disk sides** of mind-numbing adventure! Requires 128k CoCo III and Disk drive. **HINT SHEET** ..... $3.95 (+ $1.00 S&H by itself) Disk ..... $34.95

**KUNG-FU DUDE** (CoCo I/II/III) See Feb. '88 review. An exciting arcade game. The **BEST** karate game ever for the CoCo! Destroy opponents and evade obstacles as you grow ever closer to your ultimate objective! Spectacular graphics, sound effects, and animation! Requires 64k, Disk drive, and Joystick. Now displays color on CM8. Disk ..... $24.95

**PYRAMIX** (CoCo III only) See Dec. '87 review. Brilliant colors, sharp graphics, and hot action in this 100% ML arcade game. You'll enjoy hopping Kubix around the pyramid, avoiding Kaderf, Smack, Smuck, & the Death Square! Disk .. $19.95

NEW **AD&D Character's Companion** (CoCo I/II/III) This great timesaving utility helps create compatible AD&D characters. Includes dice rolling routine, pick ability, race & class. Buy from the Players Handbook, magic items & spell materials. Save, load, and print character info. 3 Disk sides .... $24.95

**White Fire of Eternity** (CoCo I/II/III) See Dec '86 review. Enter the era of monsters & magic. Search for the legendary power of White Fire throughout the Forbidden Wood & Dark Caverns in this 64k animated adventure! Disk..$19.95

**Champion** (CoCo I/II/III) See May '87 review. Become a superhero in this action adventure! Disk..$19.95

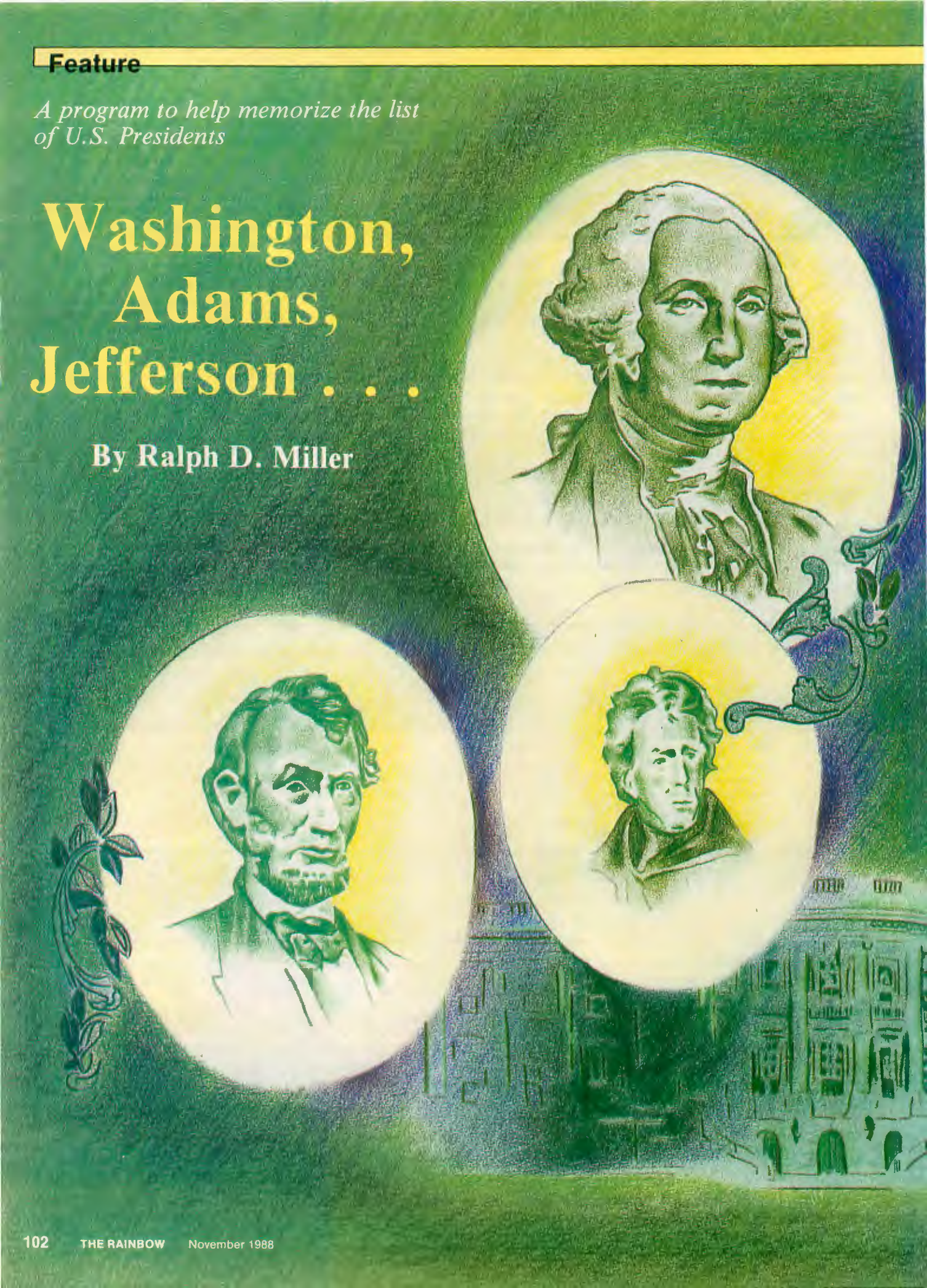
**Dragon Blade** (CoCo I/II/III) See Nov '86 review. Slay evil dragon in this 64k animated adventure! Disk..$19.95

Feature

*A program to help memorize the list of U.S. Presidents*

# Washington, Adams, Jefferson . . .

By Ralph D. Miller



When my eldest daughter was assigned the learning of the list of presidents of the United States, I wrote *Presidents* to help her. It has been tested by members of her fifth grade class and found to be effective. The techniques used are quite simple, so it is a good choice for beginning programmers to use in experimenting with modifications.

As written, *Presidents* runs in 16K Extended Disk BASIC. Instructions follow to modify the program for cassette-based systems. It can also be made usable on non-extended machines by deleting lines 710, 720 and 730, and by changing GOTO 710 in Line 172 to GOTO 740.

The printer baud rate is set in Line 740 and as written, is set for 2400 on my IDS-460 printer. For use at 600 baud, change POKE150,17 in Line 740 to POKE150,87. For 1200 baud, use POKE150,41. Some systems prefer POKE150,15 for 2400 baud operation. The only other printer code in the program is in Line 794 (CHR$(12)) for form feed.

*Presidents* is designed to run a directory program when you exit. The one that I use is *Hello* by Doug Heyza (August 1985, Page 69). If you don't want to use such a program, change Line 160 to IF Z$="R" THEN CLS:DIR.

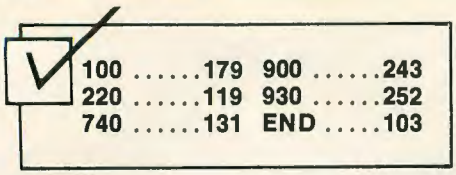
To modify the program for cassette use, take RETURN (TO DISK MENU) out of Line 110, and delete the spaces after MENU until the 'q' in QUIT is directly under the 'h' in HARD. Next delete Line 160. Finally, in Line 130, delete AND Z$<>"R".

That's about it! *Presidents* is neither long nor complex, so type it in and give the children a bit more perspective on history. I'm sure the comments on progress section (lines 915 through 935) could be much more creative, so add your own, perhaps personalized for your child.

*(Questions or comments concerning this program may be directed to the author at P.O. Box 13322, Tallahassee, FL 32317. Please enclose an SASE when requesting a reply.)* □

---

*Ralph Miller is a broadcast engineer on the systems staff at John H. Phipps Broadcasting. He lives in Tallahassee, Florida.*




**The Listing:** PRESDENT

```
5 CLS
1Ø REM THIS PROGRAM (C) 1985 BY
RALPH D. MILLER, POB 13322, TALL
AHASSEE, FL 32317 (9Ø4) 386-3618
---ALL RIGHTS RESERVED---
22 PRINT
24 PRINT"            presdent"
26 PRINT
28 PRINT" ***********************
********"
29 PRINT" ***** MEMORIZATION HEL
PER ****"
3Ø PRINT" ************ FOR *****
********"
31 PRINT" ****** U.S. PRESIDENTS
 *******"
32 PRINT" ***********************
********"
33 PRINT" * (C)1985 BY RALPH D.
MILLER *"
34 PRINT" ******* (9Ø4) 386-3618
 *******"
35 PRINT" ***********************
********"
36 PRINT" **** ALL RIGHTS  RESER
VED ****"
37 PRINT" ***********************
********"
4Ø FOR T=1 TO 5ØØØ:NEXT T
1ØØ DIM A$(4Ø),B$(4Ø),C$(4Ø)
1Ø5 CLS:V=Ø
11Ø PRINT:PRINT:PRINT"      eASY
(LAST NAME ONLY)            hARD
(ENTIRE NAME)               rETUR
N (TO DISK MENU)            qUIT
(RETURN TO BASIC)           pRINT
 (HARDCOPY LIST)"
12Ø Z$=INKEY$:IF Z$="" THEN 12Ø
13Ø IF Z$<>"E" AND Z$<>"H" AND Z
$<>"R" AND Z$<>"Q" AND Z$<>"P" T
HEN 1Ø5
14Ø IF Z$="E" THEN E$="LAST"
15Ø IF Z$="H" THEN E$="ENTIRE"
16Ø IF Z$="R" THEN RUN "DIRECTRY
"
17Ø IF Z$="Q" THEN POKE&H71,Ø:EX
EC&HAØ27
172 IF Z$="P" THEN GOTO 71Ø
175 RESTORE
18Ø CLS
19Ø PRINT"BEGINNING WITH THE FIR
ST, INPUT EACH PRESIDENT'S "E$"
NAME,"
2ØØ LINEINPUT"IN CHRONOLOGICAL O
RDER OF THEIR PRESIDENCY: ";F$
21Ø IF F$="" THEN GOTO 1Ø5
22Ø X=1:W=Ø
23Ø GOSUB 63Ø
27Ø X=X+1
28Ø LINEINPUT"NEXT: ";F$
285 IF F$="" THEN GOTO 8ØØ
3ØØ GOTO 23Ø
63Ø READ A$(X),B$(X),C$(X)
635 IF C$(X)="REAGAN" THEN GOTO
9ØØ
637 IF Z$="E" THEN 672
64Ø IF B$(X)="N" THEN B$(X)="":D
$=A$(X)+" "+C$(X):GOTO 69Ø
65Ø IF B$(X)<>"N" THEN D$=A$(X)+
" "+B$(X)+" "+C$(X)
66Ø IF LEN(B$(X))>1 THEN 69Ø
67Ø D$=A$(X)+" "+B$(X)+"."+" "+C
$(X)
672 IF Z$="E" THEN D$=C$(X)
69Ø IF F$<>D$ THEN PRINT "SORRY.
 YOU SHOULD HAVE ENTERED: "D$:W=
W+1:GOTO 695
695 RETURN
71Ø V=PEEK(65314):IF V=4 OR V=6
THEN 74Ø
72Ø CLS:PRINT@2ØØ,"printer off l
ine":V$=INKEY$:IF V$="" THEN 72Ø
73Ø V=PEEK(65314):IF V=4 OR V=6
THEN 74Ø
735 GOTO 1Ø5
74Ø POKE149,Ø:POKE15Ø,17
742 CLS:PRINT@2ØØ,"now printing
list"
75Ø RESTORE
755 FOR Y=1 TO 4Ø
76Ø READ A$(Y),B$(Y),C$(Y)
765 IF B$(Y)="N" THEN B$(Y)="":D
$=A$(Y)+" "+C$(Y):GOTO 79Ø
77Ø IF B$(Y)<>"N" THEN D$=A$(Y)+
" "+B$(Y)+" "+C$(Y)
772 IF LEN(B$(Y))>1 THEN 79Ø
774 D$=A$(Y)+" "+B$(Y)+"."+" "+C
$(Y)
79Ø PRINT#-2,D$
792 NEXT Y
794 PRINT#-2,CHR$(12)
795 GOTO 1Ø5
8ØØ PRINT:PRINT"YOU HAVE GOTTEN
```

```
THROUGH"X-1
81Ø PRINT"PRESIDENTS."
82Ø PRINT"YOU GAVE"W"WRONG ANSWE
R(S)."
83Ø PRINT:PRINT:PRINT"        str
ike any key"
84Ø M$=INKEY$:IF M$="" THEN 84Ø
845 GOTO 1Ø5
9ØØ CLS
9Ø5 PRINT:PRINT"YOU HAVE GOTTEN
THROUGH ALL      FORTY PRESIDENTS
.":PRINT
91Ø PRINT"YOU GAVE"W"WRONG ANSWE
R(S).":PRINT
915 IF W=Ø THEN L$="INCREDIBLY S
TUPENDOUS,           MOVE OVER, E
INSTEIN!":GOTO 95Ø
92Ø IF W<6 THEN L$="OUTSTANDING!
                     YOU WILL VER
Y SOON               HAVE THEM AL
L MASTERED.":GOTO 95Ø
925 IF W<11 THEN L$="VERY GOOD!
                      IT'S ALL DO
WNHILL                FROM HERE."
:GOTO 95Ø
93Ø IF W<21 THEN L$="YOU'RE HALF
WAY THERE!":GOTO 95Ø
935 IF W<31 THEN L$="YOU'VE MAST
ER A QUARTER OF      THEM! PRACT
ICE MAKES PERFECT!"
95Ø PRINT L$:PRINT:PRINT:PRINT"
      strike any key"
96Ø M$=INKEY$:IF M$="" THEN 96Ø
97Ø GOTO 1Ø5
1ØØØ DATA GEORGE,N,WASHINGTON,JO
HN,N,ADAMS,THOMAS,N,JEFFERSON,JA
MES,N,MADISON,JAMES,N,MONROE,JOH
N,QUINCY,ADAMS,ANDREW,N,JACKSON,
MARTIN,VAN,BUREN,WILLIAM,HENRY,H
ARRISON,JOHN,N,TYLER
1ØØ1 DATA JAMES,N,POLK,ZACHARY,N
,TAYLOR,MILLARD,N,FILLMORE,FRANK
LIN,N,PIERCE,JAMES,N,BUCHANAN,AB
RAHAM,N,LINCOLN,ANDREW,N,JOHNSON
,ULYSSES,S,GRANT,RUTHERFORD,B,HA
YES,JAMES,N,GARFIELD
1ØØ2 DATA CHESTER,N,ARTHUR,GROVE
R,N,CLEVELAND,BENJAMIN,N,HARRISO
N,GROVER,N,CLEVELAND,WILLIAM,N,M
CKINLEY,THEODORE,N,ROOSEVELT,WIL
LIAM,H,TAFT,WOODROW,N,WILSON,WAR
REN,G,HARDING,CALVIN,N,COOLIDGE
1ØØ3 DATA HERBERT,N,HOOVER,FRANK
LIN,D,ROOSEVELT,HARRY,S,TRUMAN,D
WIGHT,D,EISENHOWER,JOHN,F,KENNED
Y,LYNDON,B,JOHNSON,RICHARD,M,NIX
ON,GERALD,N,FORD,JAMES,E,CARTER,
RONALD,N,REAGAN
```


"The Year Of The Hard Drive"

Hackers Holiday Special

Hard Drive Kits

(Drive, SASI controller, Power Supply & Cables)

5Meg.....$12Ø

8Meg.....$14Ø

10Meg.....$16Ø

*Disto Hard Drive Interface...$5Ø.ØØ

2ØMeg System. Complete. Ready to plug in and run.....$35Ø.ØØ

ARIZONA SMALL COMPUTER PERIPHERALS

93Ø W. 23rd St. Suite 26

Tempe, Az. 85282

Phone (6Ø2)-829-8Ø28

*When purchased with kit.

All drives formatted in CoCo OS9 format. Os9 SASI drivers included.

Burke & Burke HyperIO supported.

Add $6.ØØ S&H on all drive orders.



**JUBILEX**

A fast paced game that requires both skill and quick thinking. Pilot your ship over the planet Jubilex. Avoid shots from the ground while you destroy their aircraft. Complex weapon system. Requires joystick, CoCo III, and disk drive. $25

**GAT BACKUP**

A 128k CoCo III backup utility that gives you the options to backup only the granules used, a section, or the entire disk. Makes multiple copies. Copies 35 tracks in two passes. Formats and gives directories. Requires CoCo III and disk drive. $15

**DIASM**

A disassembler that loads a file and allows you to disassemble it as if it were in memory, no matter where the program is really located. Works with auto-executing programs. Many other features. Supports printer. CoCo I, II, or III. Disk only. $20

All programs are in machine language. Add $5 per program if you want the source file included. We pay shipping and sales tax. Write for more information, or send check or money order to:

**GSW Software**
**8345 Glenwood**
**Overland Park, KS 66212**

# The BBSs in North America

For our Telecommunications issue, we at THE RAINBOW have compiled a list of bulletin board systems running in the United States and Canada. Our list was compiled with the help of all SysOps who answered our request for information. We hope this list will make BBS users aware of the BBS systems in their area.

Our list arranges known BBSs by state and includes the BBS phone number, BBS name and the parameters. The systems are up 24 hours a day, seven days a week, unless otherwise noted by a superscript after the BBS name. Use this list to sample various BBSs, and enjoy the chance try a new system.

If you are running a BBS and would like to have it listed in a future issue of the THE RAINBOW, send us a letter, including the information listed here to: The Rainbow BBS List, P.O. Box 385, Prospect, KY 40059.

| State/City | BBS Name | Access Number | Parameters (Baud Rate-Parity-Word Bits-Stop Bits) | SysOp |
|---|---|---|---|---|
| **Alabama** | | | | |
| Mobile | The Color Computer Board of Mobile | (205) 341-4610 | 300-E-7-1 | Edward Jones |
| **Arizona** | | | | |
| Glendale | The Exchange[1] | (602) 848-9902 | 300/1200-E-8-1 | Charles Pippin |
| Phoenix | CoCo BBS-157 | (602) 246-2131 | 300/1200-N-8-1 | Curtiss Schuler |
| **California** | | | | |
| Santa Ana | Color Galaxy | (714) 545-5156 | 300/1200-O-7-1 | Tom Guzman |
| **Connecticut** | | | | |
| Groton | CoConut Manor | (203) 449-1792 | 300/1200/2400-N-8-1 | Ken Parsley |
| **Florida** | | | | |
| Miami | Dade CoCo South | (305) 266-1099 | 300 to 1200-E-7-1 | Robert Jones |
| Miami | The Matrix BBS | (305) 895-2312 | 300-N-8-1 | Criss Malcom |
| North Miami | Dade CoCo North | (305) 893-2894 | 300-E-7-1 | Alan Potter |
| St. Petersburg | The CCUG BBS | (813) 867-2284 | 300/1200-E-7-1 | Tim Jay |
| **Iowa** | | | | |
| Boone | The Tomb | (515) 432-7853 | 300/1200/2400-N-8-1 | Steve Kratz |
| **Illinois** | | | | |
| Chicago | The Mindmaster's Domain | (312) 463-8932 | 300/1200-N-8-1 | David Lucas |
| **Indiana** | | | | |
| Evansville | Disk Bank | (812) 422-4821 | 300/1200-E-7-1 | Dave Jenkins |
| Shelbyville | Duke's Shelbyville Colorama | (317) 392-2769 | 300/1200-E-7-1 | Duke Norris |
| **Kentucky** | | | | |
| Bulan | Hackers BBS[2] | (606) 439-1853 | 300 to 1200-N-8-1 | Kenny Napier |
| **Maine** | | | | |
| Sanford | TreeTops BBS | (207) 490-2870 | 300/1200/2400-N-8-1 | Michael Lescord |

| State/City | BBS Name | Access Number | Parameters (Baud Rate-Parity-Word Bits-Stop Bits) | SysOp |
|---|---|---|---|---|
| **Michigan** | | | | |
| Bay City | Warped Board | (517) 686-7598 | 300/1200/2400-N-8-1 | Dave Witucki |
| Bay City | Plastered Board | (517) 892-7885 | 300/1200/2400-N-8-1 | Mark Danak |
| Manton | The Manton Modem | (616) 824-6026 | 300-E-7-1 | Carl Johnson |
| **Mississippi** | | | | |
| Meridian | The Compute Rama BBS[3] | (601) 693-8092 | 300-N-7-1 | Kevin Sloan |
| **Missouri** | | | | |
| Kansas City | The Frisky CoCo | (816) 436-2904 | 300/1200/2400-N-8-1 | Jerry Oliver |
| **Nebraska** | | | | |
| Wayne | Hardsector BBS[4] | (402) 375-1513 | 300-E-7-1 | Nathan Tompkins |
| **New Hampshire** | | | | |
| Manchester | CoComaster's BBS[5] | (603)644-4867 | 300-baud | George Proulx |
| **New Jersey** | | | | |
| Hawthorne | DYM 399/ORA 18 | (201) 427-8418 | 300/1200/2400-N-8-1 | David Fischer |
| Mercerville | TAO BBS | (609) 587-2672 | 300/1200/2400-E-8-1 | Bob Watson |
| New Milford | The Rainbow Connection Info System | (201) 967-1061 | 300/1200-N-8-1 | Steve Rottinger |
| **North Carolina** | | | | |
| Concord | The Data-Link | (704) 788-7867 | 300/1200-N-8-1 | Jim Brock |
| Fayetteville | CoCo' nuts BBS | (919) 425-8242 | 300/1200-E-7-1 | Tom Taylor |
| Gastonia | The BBS of Belmont Abbey College | (704) 825-6201 | 300 to 2400-E-8-2 | Ron Millar |
| Newport | The Dungeon | (919) 726-9737 | 300/1200/2400-N-8-1 | Chuck Katsekes |
| **Ohio** | | | | |
| Bellaire | Harlock's Hideaway | (614) 676-2505 | 300/1200/2400-N-8-1 | Dave Roth |
| Gallipolis | The Rainbow's End[6] | (614) 446-7430 | 300/1200-N-8-1 | John Grubb |
| Sharonville | Omega | (513) 671-2049 | 300/1200/2400-N-8-1 | Thomas Altum |


# CODIS ENTERPRISES

2301-C CENTRAL DRIVE, SUITE 684, BEDFORD, TX 76021

ZOOMDUMP -- Versatile graphics dump for DMP-105, DMP-106 or other compatible. Print out "PMODE4" screen or any rectangular section thereof in custom height/width sizes, upright or sideways, and negative or positive image. Sample printouts available upon request if return postage provided.
16K ECB, tape or disk.....$14.00

SALE! REMUSIC 1.0 -- Powerful music synthesis software that compiles REM statements into up to 4 musical voices with amplitude envelopes. Requires TV or monitor w/ speaker! No other extra sound hardware needed. See May '88 RAINBOW review.
16K ECB, Disk only.....~~$25.00~~ $19.00 thru 12-31-88

BACH LOVERS, UNITE! -- 6 disks, each containing over 60 J.S. Bach four-part chorales in unique REMUSIC format, and another disk with Bach two-part inventions & other miscellaneous crud -- 7 disks in all! REMUSIC 1.0 purchase NOT required.
Each Bach disk.....$12.00
Any 4.....$44.00
All 7.....$70.00

CODIS COCO COMEDIAN -- This all-new MAGAZINE specializes in the humorous side of life with our illustrious CoCo -- from current world events to programs that mock them! from reader anecdotes to tongue-in-cheek product reviews! from "Nervous Novice" to "Technical Tickles" -- serving one objective from first page to last! Let-loose laughter! You won't want to miss this experience. Send for your subscription now.
12 hilarious monthly issues.....$24.00

* * * * * * *

Send check or money order made payable to: Codis Enterprises. Texas Residents add 7% sales tax. Feel free to write with any questions.



# COLOR RIBBONS & PAPER

## COLOR RIBBONS

RED • BLUE • GREEN • BROWN • PURPLE • YELLOW

| Ribbons | Price Each: | Black | Color | Heat Transfer |
|---|---|---|---|---|
| Radio Shack | — DMP 100 | 6.00 | 9.00 | — |
| | — DMP 110 | 4.15 | 4.75 | 5.75 |
| | — DMP 120 | 6.75 | 8.50 | — |
| | — DMP 130 | 5.25 | 6.50 | 7.95 |
| | — DMP 200 | 6.75 | 8.50 | — |
| | — DMP 230/520 | 4.00 | 5.25 | — |
| | — DMP 2100 | 5.75 | — | — |
| | — DMP 410/510 | 5.00 | 7.00 | — |
| | — DMP 430 | 12.00 | — | — |
| Apple Imagewriter I/II | | 3.75 | 4.50 | 6.50 |
| Citizen 120 D | | 5.00 | 6.00 | 7.95 |
| Epson MX80/LX800 | | 3.75 | 4.25 | 6.75 |
| Okidata 182/192 | | 6.50 | 7.50 | — |
| Panasonic K-XP 1090 | | 6.75 | 7.75 | — |
| Seikosha SP 800/1000 | | 5.25 | 6.50 | 7.95 |
| Star NX10/NL10 | | 5.00 | 6.00 | 7.95 |
| Star NX 1000 | | Call For Price | | |

## COLOR PAPER

BRIGHT PACK—200 Sheets/50 each color: Red, Blue, Green, Yellow. 9 1/2 × 11 — $10.90/pk.

PASTEL PACK—200 Sheets/50 each color: Pink, Yellow, Blue, Ivory. 9 1/2 × 11 — $10.90/pk.

**T-SHIRT RIBBONS** (Heat Transfer) — Call For Price.

## COLOR DISKETTES

5 1/4" DS/DD Rainbow Pack. 10/pack — $12.50

For ribbons & paper not listed above, call for price & avail. Price & spec. subject to change w/o notice. Min. order $25.00. Min. S & H $3.50. Add $2.25 C.O.D. add'l. IL res. add 6.25% tax. MC & Visa accepted.

***RENCO COMPUTER SUPPLIES***

P.O. Box 475, Manteno, IL 60950 U.S.A.

1-800-522-6922 • (IL) 1-800-356-9981 • 815-468-8081

| State/City | BBS Name | Access Number | Parameters (Baud Rate-Parity-Word Bits-Stop Bits) | SysOp |
|---|---|---|---|---|
| **Pennsylvania** | | | | |
| Easton | ASCII-=80=-BBS | (215) 252-1608 | 300-E-7-1 | Nevin Keller |
| Norristown | Graphics Pub BBS[7] | (215) 277-6951 | 300/1200/2400-N-8-1 | Bob Montowski |
| Reading | The Glass Menagerie | (215) 376-1819 | 300/1200/2400-N-8-1 | H. Allen Cravener |
| **Rhode Island** | | | | |
| Providence | Tempo BBS | (401) 456-9394 | 300 to 2400-N-8-1 | Arthur Mendoca |
| **Tennessee** | | | | |
| Memphis | MCCUG BBS | (901) 458-9584 | 300/1200-E-7-1 | B.J. Seaton |
| **Utah** | | | | |
| Salt Lake | Data Warehouse of Salt Lake | (801) 969-6051 | 1200-N-8-1 | |
| West Valley City | The CoCoshop BBS | (801) 250-1941 | 300/1200-N-8-1 | Dennis & Terry Gray |
| **Virginia** | | | | |
| Henry | Colorama 86 V4.0[8] | (703) 365-2018 | 1200-N-8-1 | Ricky Sutphin |
| **Washington** | | | | |
| Kennewick | The Time Machine | (509) 586-2559 or 586-2160 | 1200-E-7-1 | Paul Alger |
| Kent | The CoCo Connection | (206) 854-3744 | 300/1200/2400-N-8-1 | Corrie Bender |
| Spokane | Data Warehouse of Spokane | (509) 325-6787 | 300/1200-E-7-1 | Dennis Mott |
| **Wisconsin** | | | | |
| Gays Mills | CoCo BBS | (608) 735-4509 | 300/1200/2400-E-7-1 | Robert & Daven Howard |
| Marshall | Madison Area Tandy Users BBS | (608) 274-6922 or 655-3806 | 300/1200/2400-N-8-1 | |
| **Canada:** | | | | |
| **Alberta** | | | | |
| Letchbridge | Public BBS System of Letchbridge | (403) 329-6438 | 300/1200/2400-N-8-1 | Dieter Rossman |
| **Nova Scotia** | | | | |
| New Waterford | Chip to Chip BBS[9] | (902) 539-7743 | 300/1200-baud | Allan Jones |
| **Ontario** | | | | |
| Angus | ECCC BBS | (705) 424-7570 | 300/1200/2400-N-8-1 | Eldon Doucete |
| Scarborough | Remote Data Systems-09 (RDS-09) | (416) 283-7521 | 300/1200/2400-N-8-1 | Doug Wright |
| **Quebec** | | | | |
| La Tuque | Babillard du Club | (819) 523-4329 | 300-N-7-1 | Renald Martin |

Notes:

[1]The Exchange is up from 6 p.m. to 6 a.m. Monday through Friday, and 24 hours Saturday and Sunday.

[2]Hackers BBS is up from 9:30 p.m. to 10 a.m., 7 days.

[3]The Computer Rama BBS is up from 10 p.m. to 1 p.m., 7 days.

[4]Hardsector BBS is up from 10:30 p.m. to 5 p.m., 7 days.

[5]Additional parameter information unavailable for CoCo master's BBS.

[6]The Rainbow's End is up from 6 p.m. to 11:30 p.m., Friday, Saturday and Sunday.

[7]Graphics Pub BBS is up from 7 p.m. to 7 a.m., 7 days.

[8]Colorama 86 V4.0 is up from 11:30 p.m. to 11:30 a.m., 7 days.

[9]Additional parameter information unavailable for Chip to Chip BBS.

# The Professional Color Computer

## Enhancements for Productivity from HJL Products

For peak performance with any computer, you have to get information into and out of the system as easily as possible.

This is the purpose of the HJL family of professional enhancements for ALL MODELS of the Color Computer, including CoCo 3.

**The Self-contained ProCase-57 Keyboard · $79.95** NEW

It's the popular HJL keyboard perfectly fitted into its own sleek, low-profile case. Put your CoCo on a shelf or hang it on the side of your desk. ProCase-57 comes with 5-foot cable; installs in just a few minutes with no soldering.

**The HJL-57 Keyboard Kit · $59.95/69.95**

Overwhelming favorite of serious CoCo users worldwide, the HJL-57 keyboard provides the smooth consistent feel and reliability you need for maximum speed with minimum input errors. Installs in your color computer without soldering. Just $59.95 for Original or F-version. Kits for CoCo 2 and CoCo 3 are $69.95.

**The NumberJack Keypad · $59.95**

A self-contained numeric keypad for serious number-crunching. Besides the numbers, it has all the cursors, symbols and math keys, including autoshifted ADD and MULTIPLY. Includes cable and connectors for solderless installation.

**The Monitor Adapter · $25.95**

This universal driver works with all monochrome monitors. Easily installed without clips, jumpers or soldering (except some CoCo 2s with soldered-in video chips). Here's crisp, flicker-free monitor output with all the reliability you've come to expect from HJL Products.

**The Monitor · $99.95**

Our high-resolution amber monitor gives you the display preferred by most computer pros. Once you've used it, you'll never go back to the TV set. 12-inch CRT has etched non-glare face-plate. (Requires adapter sold above)

**Quick Basic Plus · $19.95**

High-performance programming aid works with any CoCo that has 4 function keys. 26 one-touch BASIC statements, 10 user-defined macros at a time (save as many sets of macros as you like), auto line-numbering, instant screen dump to printer, and global search, make this software ideal for any BASIC programmer. Specify disk or cassette.

**The SoftSwitch · $89.95**

Connect any two parallel printers to one computer; select printers manually or insert a simple printer code in the text to be printed for fully-automatic, all solid-state switching. Complete with three cables and operating instructions.

**The HJL Warranty**

Every HJL product comes with a full, one-year warranty and the exclusive HJL 15-day unconditional guarantee (except software).

**Pick a Pair and Save 15%**

Take 15% off the price of any two or more products shown here. Just mention this ad when you order.

## Call Now, Toll Free

## 1-800-828-6968

**In New York 1-800-462-4891**
**International calls: 716-235-8358**

HJL PRODUCTS

Div. of Touchstone Technology Inc.
955 Buffalo Road • P.O. Box 24954
Rochester, New York 14624

**Ordering Information:** Specify model (Original, F-version, or CoCo 2 Model Number). Payment by C.O.D., check, MasterCard, or Visa. Credit card customers include complete card number and expiration date. Add $2.00 for shipping, 3.50 to Canada; except monitors (call for shipping charges before ordering monitors). New York state residents add 7% sales tax. **Dealer inquiries invited**

*Modify an old favorite to use on the CoCo 3*

# A *Remote* Update

## By Paul Alger

I've been running my own BBS for a few years and have always used THE RAINBOW'S *Remote* (November '85, Page 106) and *Remot232* (November '86, Page 70) as my terminal drivers. When I purchased my new CoCo 3, however, I found that the *Remote* programs were not compatible with 40- and 80-column screens. To alleviate this problem, I modified *Remot232* to allow the use of 40- and 80-column screens *and* to provide scroll- and CLS-protected areas on all screens. For those of you who would like to use the *Remote* programs in a 40- or 80-column format, allow me to present *Remote 3*.

*Remote 3* will work on any CoCo that has at least 32K of memory. The program includes all of the *Remote* pro-

---

*Paul Alger, SysOp for the Time Machine BBS, holds a bachelor's degree in audio engineering. Paul currently works as a professional musician.*

**Table 1**

***Remote 3* Pokes**

| Location | Description |
|---|---|
| 7D00 | If 7D00 contains 1, the BREAK key is disabled from the remote user. If it contains 0, the remote user can use the BREAK key to break into BASIC. |
| 7D01 | If 7D01 contains 1, the incoming character is displayed in the right-hand corner of the scroll-protected area. If it contains 0, the feature is turned off. |
| 7D02 | If 7D02 contains 1, line feeds are sent with a carriage return. If it contains 0, no line feeds are sent. |
| 7D03 | If 7D03 contains 0, normal characters are sent to the remote terminal. Any other value echoes the character with that ASCII code to the remote terminal. POKE-&H7D03,65 will echo all A's to the remote terminal no matter what you see on your terminal screen. (Use this feature for password entry.) |
| 7D04 | If 7D04 contains 0, input from the remote terminal is not affected. A 1, however, converts the input from the remote terminal to all uppercase, and a 2 converts the input from the remote terminal to all lowercase. |
| 7D05 | This location works the same as 7D04 except that instead of the input, the output from the remote terminal is converted. |
| 7D06 | Cursor value (32-column screen only). |
| 7D07 & 7D08 | Used for scroll-protection in *Remote*. Poking here has no effect on *Remote 3*. |

**Clock Pokes**

| Location | Description |
|---|---|
| 7F00 to 7F14 | These locations contain a 20-byte CLS- and scroll-protected area. Poke the string to be protected into this area. |
| 7F1D | Each time the clock reaches 24:00 (midnight), this location increments by 1. Peek this location to roll over the date. |
| 7F1E | Location 7F1E contains a count-down timer. When a user logs on, poke the number of minutes you allow the user to remain online. Periodically peek this location. Time is up when the value is 0. |
| 7F20 | If 7F20 contains 1, the clock display is turned off. A 0 indicates that the display is on. |
| 7F21 | If 7F21 contains 0, the string display is turned off. A 1 indicates that the string is displayed. |
| 7F22 | If 7F22 contains 0, the "chat" flag is turned off. A 1 indicates that the flag is on. The "chat" flag flashes in the right-hand corner of the scroll-protected area. |
| 7F23 | This is the clock speed. The default value is 50. Poking any other value in this location changes the speed of the clock. The higher the number, the slower the clock. |
| 7FD5 | This location will invert the clock display on the 32-column screen only. If the location contains 48, the clock will appear green on a black background. If it is 112, the clock will appear black on a green background. Any other value will produce garbage in the clock display. |

**Listing 1:**

```
00100 **************************
00110 *  REMOTE 3 FOR 232 PAC *
00120 * A TERMINAL DRIVER FOR *
00130 * THE COCO 3 & RS232 PAC*
00140 * FROM THE ORIGINAL     *
00150 * REMOTE PROGRAM BY     *
00160 * DAN DOWNARD RAINBOW   *
00170 *       11/83           *
00180 * MODIFIED BY           *
00190 * SCOTT TAYLOR RAINBOW  *
00200 *       11/85           *
00210 * MODIFIED FOR RS 232 BY*
00220 * MARK CROSBY RAINBOW   *
00230 *       11/86           *
```

grams' original bells and whistles except scroll-protection. To remedy this loss, I have included a software clock that allows 20 characters of scroll- and CLS-protection.

Included with this article are four listings. The first is the assembly listing for the *Remote 3*. This version of the program is for use with the RS-232 pack, and the pack *must be installed* before the program will work properly. (I do have a serial-port version of *Remote 3* and would be glad to send it to anyone who wants it. To receive that listing, please send me an SASE, a blank disk and the necessary postage. The address appears at the end of the article.)

Listing 2 is a software clock, which uses interrupts to allow the clock to be updated during disk access. The clock program provides CLS- and scroll-protection as well as a few other features I wanted for my BBS operation.

Listing 3 is a BASIC loader that creates *Remote 3* and the software clock in memory. It then saves these two programs as one *workable* ML file on tape or disk.

Finally, I've included a short demonstration program, Listing 4. This demonstration offers a few examples of the program's various uses, including those for the new features. This demo program can only be used on a CoCo 3 and online at 300 baud.

All program features are listed with their corresponding memory locations in Table 1. The descriptions presented for each location include both the program feature and the values used to achieve these results.

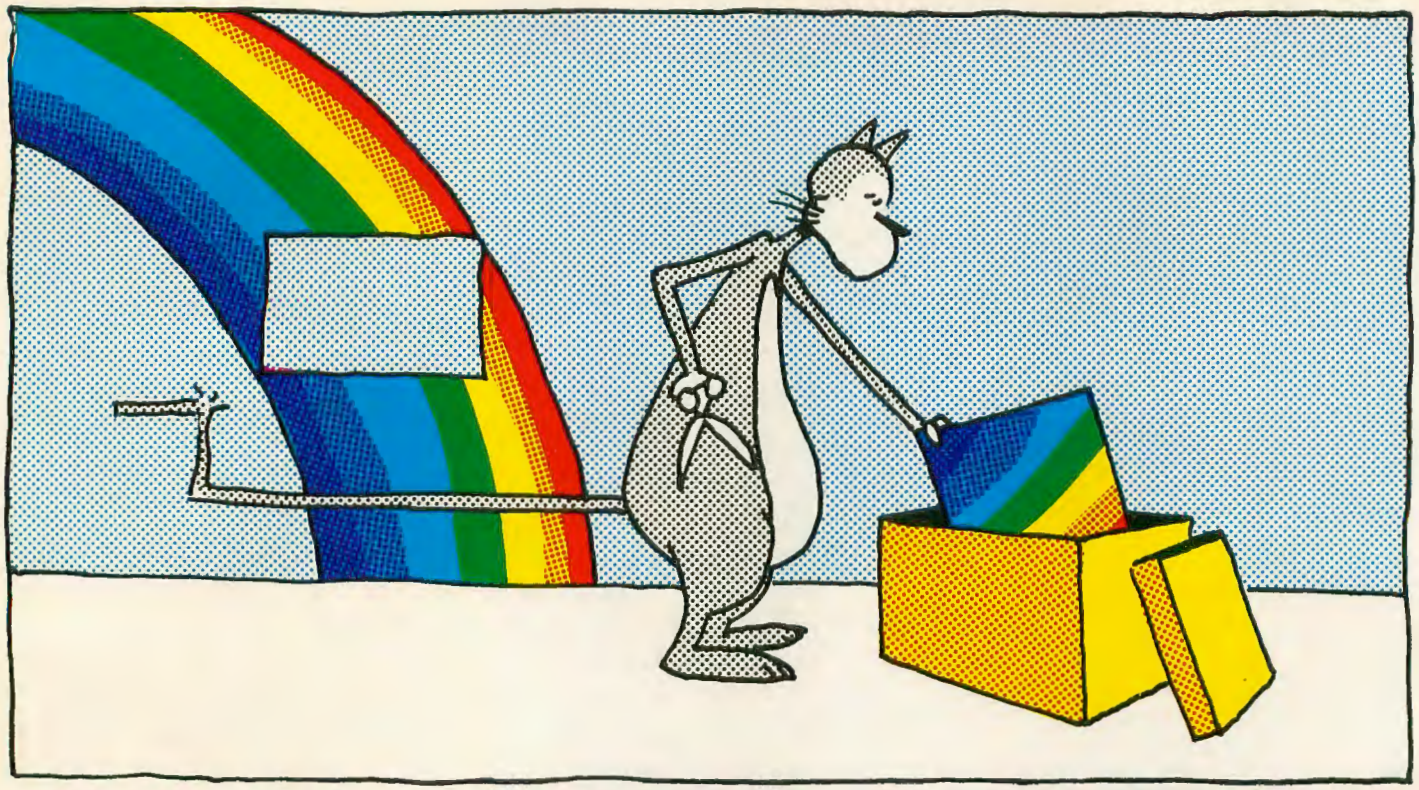
*Remote 3* does have one small annoyance. The cursor does not self-destruct when the backspace key is pressed. If that bothers you, type the following:

```
POKE&H7D06,96
```

The bug (and the cursor) will disappear.

If you would like to sample a BBS that uses this terminal driver, give my BBS — the Time Machine — a try. Call (509) 586-2559 or (509) 586-2160. The BBS runs at 7-bit, 1 stop bit, even parity, 300/1200 baud, 24 hours a day. The BBS features a multi-player D & D game, a multi-player *World War* game and an updated version of my *Galactic Conflict* game. Give me a call sometime.

*(Questions or comments concerning these programs may be directed to the author at 1303 West 26th, Kennewick, WA 99337. Please enclose an SASE when requesting a reply.)* □



# HOW DO YOU GIVE A RAINBOW?

**It's simple — Give a RAINBOW gift certificate . . .**

Let a *gift* subscription to THE RAINBOW carry the premier Color Computer magazine right to your friends' doorsteps. THE RAINBOW is *the* information source for the Tandy Color Computer.

Each month, your friends will enjoy the intelligent programs, reviews and articles written exclusively for their CoCo.

First, your gift will be announced in a handsome card. Then, all year 'round, they'll remember you and your thoughtfulness when they get each edition of THE RAINBOW — more than 200 pages loaded with as many as 24 programs, 15 regular columns and lots of helpful hints and tips.

Generosity benefits the giver, too. There'll be no more tracking down borrowed copies of THE RAINBOW. Your collection will be safe at home.

Give a RAINBOW gift certificate and let your friends in on the fun. THE RAINBOW is the perfect companion for the Color Computer!

**Get your order to us by November 25 *and we'll* begin your friends' subscriptions with the January issue of RAINBOW.**

**Please begin a one-year (12 issues) gift subscription to THE RAINBOW for:**

Name _____

Address _____

City _____ State _____ ZIP _____

**From:**

Name _____

Address _____

City _____ State _____ ZIP _____

☐ My payment is enclosed.

Bill to: ☐ VISA ☐ MasterCard ☐ American Express

Acct. # _____ Exp. date _____

Signature _____

Mail to:
**Rainbow Gift Certificate, The Falsoft Building, P.O. Box 385, Prospect, KY 40059**

For credit card orders call (800) 847-0309, 8 a.m. to 5 p.m. EST.
All other inquiries call (502) 228-4492.

Subscriptions to THE RAINBOW are $31 in the United States; U.S. $38 in Canada. The surface rate to other countries is U.S. $68; the air rate, U.S. $103. Kentucky residents add 5% sales tax. **U.S. currency *only*, please.** All subscriptions begin with the current issue. Please allow 6 to 8 weeks for delivery. In order to hold down non-editorial costs, we do not bill.

```
                        00240 * MODIFIED FOR COCO 3 BY*
                        00250 * PAUL ALGER            *
                        00252 *         6/88          *
                        00254 ********************************
7D00                    00260          ORG     $7D00
                        00270 *EQUATES FOR ROM AND RAM
            016A        00280 IHOOK    EQU     $016A
            0167        00290 OHOOK    EQU     $0167
            A000        00300 POLCAT   EQU     $A000
            006F        00310 DEV      EQU     $6F
            0070        00320 FLAG     EQU     $70
7D00        01          00330 BREAK    FCB     $01
7D01        01          00340 CORNER   FCB     $01
7D02        01          00350 LFFLG    FCB     $01
7D03        00          00360 PRTFLG   FCB     $00
7D04        00          00370 ICASE    FCB     $00
7D05        00          00380 OCASE    FCB     $00
7D06        9F          00390 CURSOR   FCB     $9F
7D07        0400        00400 NOSCRL   FDB     $400
7D09        00          00410 COUNTR   FCB     $00
7D0A                    00420 TABLE    RMB     $28
                        00430 *INITIALIZE RAM HOOKS
7D32 BE     0168        00440 START    LDX     1+OHOOK
7D35 AF     8D 008B     00450          STX     1+ORET2,PCR
7D39 BE     016B        00460          LDX     1+IHOOK
7D3C AF     8D 00F1     00470          STX     1+IRET2,PCR
7D40 86     7E          00480          LDA     #$7E
7D42 B7     0167        00490          STA     OHOOK
7D45 B7     016A        00500          STA     IHOOK
7D48 30     8D 0048     00510          LEAX    OUT,PCR
7D4C BF     0168        00520          STX     1+OHOOK
7D4F 30     8D 0073     00530          LEAX    IN,PCR
7D53 BF     016B        00540          STX     1+IHOOK
                        00550 * MOVE TABLE OF ROM ADDRESS
                        00560 *SET INKEY$ TO ROM BASED ROUTINE
7D56 8E     AA29        00570 MOVTBL   LDX     #$AA29
7D59 31     8C AE       00580          LEAY    TABLE,PCR
7D5C 10BF   0128        00590          STY     $128
7D60 EC     81          00600 GETADD   LDD     ,X++
7D62 ED     A1          00610          STD     ,Y++
7D64 8C     AA51        00620          CMPX    #$AA51
7D67 26     F7          00630          BNE     GETADD
7D69 30     8D 0005     00640          LEAX    INKEY,PCR
7D6D 31     3C          00650          LEAY    -4,Y
7D6F AF     A4          00660          STX     ,Y
7D71 39                 00670 RET      RTS
                        00680 *CHECK KEYBOARD AND
                        00690 *RS232 FOR INKEY$ 255
                        00700 *TIMES IF NOTHING IN $87
7D72 96     87          00710 INKEY    LDA     <$87
7D74 26     15          00720          BNE     YES
7D76 86     FF          00730          LDA     #$FF
7D78 B7     7D09        00740          STA     COUNTR
7D7B AD     9F A000     00750 INKEY2   JSR     [POLCAT]
7D7F 26     0A          00760          BNE     YES
7D81 BD     7DE6        00770          JSR     REMIN
7D84 26     05          00780          BNE     YES
7D86 7A     7D09        00790          DEC     COUNTR
7D89 26     F0          00800          BNE     INKEY2
                        00810 *CHARACTER IN A REGISTER
                        00820 *BRANCH IF BREAK (A=$03)
                        00830 *CONVERT TO STRING
7D8B 81     03          00840 YES      CMPA    #$03
```


PERRY COMPUTERS

The Ideal Buy

1-800-248-3823

**TANDY COMPUTERS**

| | |
|---|---|
| Tandy 1000-HX 256K 5 1/4"D. | 535.00 |
| Tandy 1000-SL 384K 5 1/4"D. | 675.00 |
| Tandy 1000-TL 640K 3 1/2"D. | 955.00 |
| Tandy 3000-NL 512K 3 1/2"D. | 1275.00 |
| Tandy 4000-LX 2 Meg 3 1/2"D. | 2999.00 |
| Tandy 4000 1 Meg 3 1/2" D. | 1890.00 |
| Tandy 5000MC 2 Meg 1 Drive | 3825.00 |
| Tandy 5000MC 2 Meg 40 Meg | 4955.00 |
| Tandy 5000MC 2 Meg 84 Meg | 5395.00 |
| Tandy 1400LT 768K 2 Drives | 1335.00 |
| Tandy 102 24K | 430.00 |
| Tandy Color 3 128K | 155.00 |

**MONITORS & BOARDS**

| | |
|---|---|
| VM-4 Monochrome Green | 95.00 |
| VM-5 Monochrome Green | 115.00 |
| CM-5 Color RGB | 220.00 |
| CM-11 Color RGB | 335.00 |
| EGM-1 Color RGB (EGA) | 510.00 |
| VGM-100 Monochrome Analog | 169.00 |
| VGM-200 Color Analog | 425.00 |
| VGM-300 Color Analog | 535.00 |
| Video 7 Vega Deluxe Card | 230.00 |
| Video 7 Vega Vga Card | 295.00 |
| Tandy EGA Card | 185.00 |
| Paradise Basic EGA Card | 160.00 |

**DRIVES**

| | |
|---|---|
| Color Computer Drive 0 | 225.00 |
| 5 1/4" External Drive 1000EX | 180.00 |
| 3 1/2" External Drive 1000EX | 200.00 |
| Tandy 20 Meg Hardcard | 450.00 |
| 5 1/4" External for Tandy 1400 | 215.00 |
| Zucker 30 Meg Hardcard | 395.00 |
| Seagate 20 Meg Hard Drive | 255.00 |
| Tandy 1000/SX/TX Controller | 69.00 |

**ZUCKER BOARDS**

| | |
|---|---|
| Zucker Serial Board | 45.00 |
| Zucker 0K Memory Board 1000 | 45.00 |
| Zucker MFB 0K for 1000 | 106.00 |
| Zucker 1200 Baud Modem Card | 75.00 |

**PRINTERS**

| | |
|---|---|
| DMP-106 Dot-Matrix | 165.00 |
| DMP-132 Dot-Matrix | 285.00 |
| DWP-230 Daisy Wheel | 345.00 |
| Epson LX-800 Dot-Matrix | 205.00 |
| Epson FX-850 Dot-Matrix | 375.00 |
| Epson FX-1050 Dot-Matrix | 540.00 |
| Epson LQ-500 Dot-Matrix | 375.00 |
| Epson LQ-850 Dot-Matrix | 579.00 |

Please write for complete price list.
We carry more items than listed here.

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. C.O.D. accepted add 2% (minimum charge $10.00). M.C., Visa add 2%. All non defective items require return merchandise authorization. Call for RMA Number before returning. Delivery is subject to product availability. Add 1½% for shipping and handling, $5.00 minimum charge.

TM - Registered Trademark of Tandy, Epson, and IBM

**Monday thru Friday 9am - 5pm EST.**

PERRY COMPUTERS

**124 South Main Street, Perry, MI 48872**
**CALL 1-517-625-4161 *or TOLL-FREE***
**1-800-248-3823**

## About The One-Liner Contest . . .

THE RAINBOW's One-Liner Contest has now been expanded to include programs of either one or two lines. This means a new dimension and new opportunity for those who have "really neat" programs that simply just won't fit in one line.

*Here are the guidelines:* The program must work in Extended BASIC, have only one or two line numbers and be entirely self-contained — no loading other programs, no calling ROM routines, no poked-in machine language code. The program has to run when typed in directly (since that's how our readers will use it). Make sure your line, or lines, aren't packed so tightly that the program won't list completely. Finally, any instructions needed should be *very* short.

Send your entry (preferably on cassette or disk) to:

**THE RAINBOW**
**One-Liner Contest**
**P.O. Box 385**
**Prospect, KY 40059**

```
7D8D 1Ø27 3Ø78     ØØ85Ø          LBEQ    $AEØ9
7D91 7E   A56B     ØØ86Ø          JMP     $A56B
                   ØØ87Ø *OUTPUT CHARACTER IF DEV=Ø
                   ØØ88Ø *INSERT LINE FEEDS IF NEEDED
                   ØØ89Ø *USE NEW PRINT ROUTINE
7D94 34   Ø6       ØØ9ØØ OUT      PSHS    A,B
7D96 ØD   6F       ØØ91Ø          TST     <DEV
7D98 26   27       ØØ92Ø          BNE     ORET1
7D9A 81   Ø8       ØØ93Ø          CMPA    #$Ø8
7D9C 27   1A       ØØ94Ø          BEQ     RMOUT2
7D9E 81   ØD       ØØ95Ø          CMPA    #$ØD
7DAØ 26   ØE       ØØ96Ø          BNE     REMOUT
                   ØØ97Ø *CHECK IF LINE FEEDS ARE
                   ØØ98Ø *TO BE SENT TO REMO TERM
7DA2 F6   7DØ2     ØØ99Ø          LDB     LFFLG
7DA5 27   11       Ø1ØØØ          BEQ     RMOUT2
7DA7 86   ØA       Ø1Ø1Ø          LDA     #$ØA
7DA9 BD   7E33     Ø1Ø2Ø          JSR     RSOUT
7DAC 86   ØD       Ø1Ø3Ø          LDA     #$ØD
7DAE 2Ø   Ø8       Ø1Ø4Ø          BRA     RMOUT2
                   Ø1Ø5Ø *ECHO CHARACTER IN PRTFLG
                   Ø1Ø6Ø *IF IT IS NOT = TO Ø
7DBØ F6   7DØ3     Ø1Ø7Ø REMOUT   LDB     PRTFLG
7DB3 27   Ø3       Ø1Ø8Ø          BEQ     RMOUT2
7DB5 B6   7DØ3     Ø1Ø9Ø          LDA     PRTFLG
                   Ø11ØØ *CHECK OUTPUT FOR UPPER-C
                   Ø111Ø *OR LOWER-C AND SEND IT
7DB8 F6   7DØ5     Ø112Ø RMOUT2   LDB     OCASE
7DBB BD   7EØA     Ø113Ø          JSR     CKCASE
7DBE BD   7E33     Ø114Ø          JSR     RSOUT
7DC1 35   Ø6       Ø115Ø ORET1    PULS    A,B
7DC3 7E   7D71     Ø116Ø ORET2    JMP     RET
                   Ø2ØØØ *INPUT FROM KEYBOARD OR
                   Ø2Ø1Ø *RS-232 IF DEV=Ø
                   Ø2Ø2Ø *USE RSIN FOR REMOTE INPUT
7DC6 B6   7DØ6     Ø2Ø3Ø IN       LDA     CURSOR
7DC9 A7   9F ØØ88  Ø2Ø4Ø          STA     [$88]
7DCD ØF   7Ø       Ø2Ø5Ø          CLR     <FLAG
7DCF ØD   6F       Ø2Ø6Ø          TST     <DEV
7DD1 26   5D       Ø2Ø7Ø          BNE     IRET2
7DD3 32   62       Ø2Ø8Ø          LEAS    2,S
7DD5 34   15       Ø2Ø9Ø          PSHS    B,CC,X
7DD7 AD   9F AØØØ  Ø21ØØ IN1      JSR     [POLCAT]
7DDB 27   Ø2       Ø211Ø          BEQ     RSCHK
7DDD 2Ø   4F       Ø212Ø          BRA     NOCHNG
7DDF BD   7DE6     Ø213Ø RSCHK    JSR     REMIN
7DE2 27   F3       Ø214Ø          BEQ     IN1
7DE4 2Ø   42       Ø215Ø          BRA     IRET1
7DE6 F6   FF69     Ø216Ø REMIN    LDB     $FF69
7DE9 C4   Ø8       Ø217Ø          ANDB    #$Ø8
7DEB 27   18       Ø218Ø          BEQ     ZEROA
                   Ø219Ø *RS-232 INPUT FROM CART
7DED C4   Ø7       Ø22ØØ RSAN     ANDB    #$Ø7
7DEF 26   14       Ø221Ø          BNE     ZEROA
7DF1 B6   FF68     Ø222Ø          LDA     $FF68
                   Ø223Ø *STORE CHAR IN UPPER RIGHT
                   Ø224Ø *CORNER OF 32 COL. SCREEN
7DF4 F6   7DØ1     Ø225Ø          LDB     CORNER
7DF7 27   Ø3       Ø226Ø          BEQ     CHKBRK
7DF9 B7   Ø41F     Ø227Ø          STA     $41F
                   Ø228Ø *CHECK FOR BREAK DISABLE
                   Ø229Ø *AND FOR BREAK SIGNAL
                   Ø23ØØ *FROM REMOTE TERMINAL
```

# The COCO hardware store

CRC COMPUTERS

## Fantastic Super Controller II

- **Radio Shack/Tandy controller compatible.**
- **Works on all COCOs - 1, 2 or 3 with or without Multi-Pak Interface.**
- **One 24/28 pin socket for 8K ROM, 2764, or 27128 EPROM.**
- **Internal MINI-EXPANSION-BUS connector for one DISTO Super Add-On.**
- **Low Power draw; within COCO's requirements.**
- **Gold Plated edge connectors.**
- **Under OS-9:**
  - Buffered Read/Write sector achieved without halting the CPU.
  - Continual use of keyboard even while reading or writing to disk.
  - System's clock no longer looses time during Read & Write.
  - NMI is blocked and transferred to IRQ in software for low CPU overhead.
  - Completely Interrupt driven for fast & smooth Multi-Tasking operations.
  - Drivers written by KEVIN DARLING

**$130.**

## DISTO Super Controller I

**$99.95**

A Superb Controller. Along with the included C-DOS, plug-in three more software selectable DOSes or 2764 or 27128 EPROMs burned to your liking.

The Internal Mini-Expansion-Bus lets you add some incredible features to the controller. Disto Super Add-Ons were designed to fit neatly inside the controller case.

## DISTO SUPER ADD-ONS

- **Real Time Clock & Printer Interface** — **$39.95**
  Have the Real Time, Date and Year displayed on your screen at a simple command.
- **Mini EPROM Programmer** — **$54.95**
  A LOW COST EPROM Programmer that attaches directly to any Disto Super Controller or MEB adapter to program those often used utilities.
- **Hard Disk Interface** — **$49.95**
  A Hard Disk Interface fully compatible with SASI controller. Fits inside the Super Controller, Ramdisk or MEB Adapter. OS-9 drivers included. Also available with RS-232 Serial Port.
- **Super RAM 3 ZeroK Board** — **$CALL**
  Now is the time to upgrade your COCO 3 to 512K of memory. Just add the memory chips and install in your COCO 3.
- **MEB Adapter** — **$24.95**
  A Stand-Alone Mini-Expansion-Bus in which you can plug any other Disto Adapter directly in a Multi-Pak without the need for a Super Controller or Ramdisk.

## NEW DISTO 3 in 1 Multi-Board Adapter

**$59.95**

This Muti-Board is an adapter that plugs in any Disto Super Controller, Ramdisk or MEB Adapter.

It includes a new and improved Printer Port (Centronics compatible), a faster Real Time Clock (works at 2MHz.) and a true RS-232 Serial Port (external 12 volt AC adapter required). DB25 cable included.

It fits neatly inside the metal case and is still within Tandy's power limits. It also works with or without a Multi-Pak.

## NEW DISTO RS-232 SuperPack

**$49.95**

- A Stand-Alone (Multi-Pak required) adapter that gives the user a true RS-232 Serial Port.
- Completely compatible with OS9's ACIA software.
- Compatible with software that requires the Tandy Deluxe RS-232 Pack.
- DB-25 cable included.

## 4 in 1 Super Board

**Coming this fall to a dealer near you**

**Real Time Clock, Printer Port, RS-232 & Hard Disk Interface all in one neat package**

CRC COMPUTERS INC.

**10802 Lajeunesse, Montreal, Quebec, Canada H3L 2E8**

**1-514-383-5293**

**We accept phone orders • Call for Canadian Prices**
**Include S&H of $4 or $8 if order exceeds $75**

**Master Card and Visa Accepted**

Sorry: No personal cheques

**See You At Princeton RAINBOWfest!**

# About Your Subscription

Your copy of THE RAINBOW is sent second class mail. You must notify us of a new address when you move. Notification should reach us no later than the 15th of the month prior to the month in which you change your address. Sorry, we cannot be responsible for sending another copy when you fail to notify us.

Your mailing label also shows an account number and the subscription expiration date. Please indicate this account number when renewing or corresponding with us. It will help us help you better and faster.

For Canadian and other non-U.S. subscribers, there may be a mailing address shown that is different from our editorial office address. Do not send any correspondence to that mailing address. Send it to our editorial offices at Falsoft, Inc., The Falsoft Building, P.O. Box 385, Prospect, KY 40059. This applies to everyone *except* those whose subscriptions are through our distributor in Australia.

```
7DFC F6   7DØØ     Ø231Ø CHKBRK  LDB     BREAK
7DFF 27   Ø6       Ø232Ø         BEQ     NOTBRK
7EØ1 81   Ø3       Ø233Ø         CMPA    #$Ø3
7EØ3 26   Ø2       Ø234Ø         BNE     NOTBRK
7EØ5 4F            Ø235Ø ZEROA   CLRA
7EØ6 39            Ø236Ø         RTS
7EØ7 F6   7DØ4     Ø237Ø NOTBRK  LDB     ICASE
                   Ø238Ø *CHECK IF CHAR SHOULD BE
                   Ø239Ø *UPPER OR LOWERCASE AND
                   Ø24ØØ *CHANGE IT ACCORDINGLY
7EØA C1   Ø1       Ø241Ø CKCASE  CMPB    #$Ø1
7EØC 26   ØB       Ø242Ø         BNE     CMPB2
7EØE 81   61       Ø243Ø         CMPA    #$61
7E1Ø 25   15       Ø244Ø         BLO     RET2
7E12 81   7A       Ø245Ø         CMPA    #$7A
7E14 22   11       Ø246Ø         BHI     RET2
7E16 8Ø   2Ø       Ø247Ø         SUBA    #$2Ø
7E18 39            Ø248Ø         RTS
7E19 C1   Ø2       Ø249Ø CMPB2   CMPB    #$Ø2
7E1B 26   ØA       Ø25ØØ         BNE     RET2
7E1D 81   41       Ø251Ø         CMPA    #$41
7E1F 25   Ø6       Ø252Ø         BLO     RET2
7E21 81   5A       Ø253Ø         CMPA    #$5A
7E23 22   Ø2       Ø254Ø         BHI     RET2
7E25 8B   2Ø       Ø255Ø         ADDA    #$2Ø
7E27 39            Ø256Ø RET2    RTS
7E28 C6   6Ø       Ø257Ø IRET1   LDB     #$6Ø
7E2A E7   9F ØØ88  Ø258Ø         STB     [$88]
7E2E 35   95       Ø259Ø NOCHNG  PULS    B,CC,X,PC
7E3Ø 7E   7D71     Ø26ØØ IRET2   JMP     RET
7E33 34   Ø4       Ø261Ø RSOUT   PSHS    B
7E35 F6   FF69     Ø262Ø RSOUT1  LDB     $FF69
7E38 C4   1Ø       Ø263Ø         ANDB    #$1Ø
7E3A 27   F9       Ø264Ø         BEQ     RSOUT1
7E3C B7   FF68     Ø265Ø         STA     $FF68
7E3F 35   Ø4       Ø266Ø         PULS    B
7E41 39            Ø267Ø         RTS
                   Ø268Ø *
7E42               Ø269Ø ZZZZ    *******
          7D32     Ø27ØØ         END     START

ØØØØØ TOTAL ERRORS
```

**Listing 2:**

```
                   ØØ1ØØ ****************************
                   ØØ11Ø *  CLOCK FOR REMOTE 3    *
                   ØØ12Ø *      BY PAUL ALGER     *
                   ØØ125 *WITH SPECIAL THANKS TO *
                   ØØ13Ø *    WAYNE LAFFARDY     *
                   ØØ17Ø ****************************
7EB4               ØØ18Ø          ORG     $7EB4
                   ØØ19Ø *SUBROUTINE FOR COCO3
                   ØØ2ØØ *CONVERTS 32 CHAR TO
                   ØØ21Ø *4Ø-8Ø COLM CHARACTERS.
7EB4 BE   EØØØ     ØØ22Ø COCO3    LDX     $EØØØ
7EB7 8C   ØØE6     ØØ23Ø          CMPX    #$ØØE6
7EBA 26   4Ø       ØØ24Ø          BNE     RETCO3
7EBC 96   E7       ØØ25Ø          LDA     $E7
7EBE 27   3C       ØØ26Ø          BEQ     RETCO3
7ECØ 8E   2F6Ø     ØØ27Ø          LDX     #$2F6Ø
7EC3 81   Ø2       ØØ28Ø          CMPA    #$Ø2
7EC5 27   Ø3       ØØ29Ø          BEQ     COL8Ø
7EC7 8E   279Ø     ØØ3ØØ          LDX     #$279Ø
```

# *Christmas Sale!*

# Tandy® Color Computer 3™

## Save $70 on a gift for the whole family.

## A powerful computer for personal productivity, education and family fun—now just $129.95.

Have a colorful Christmas with the advanced Color Computer 3. This powerful computer is perfect for all kinds of applications: word processing, education, entertainment, programming, graphics and more. It's a gift for the whole family.

**Start computing Christmas day.** Just attach the Color Computer 3 to your color TV, and you're ready to begin programming in BASIC. Or plug in a Program Pak™ for instant fun and games, personal finance and many other applications. The Color Computer 3 is compatible with software and accessories designed for our popular Color Computer 2.

**Add a monitor for advanced graphics.** For razor-sharp color graphics, add our CM-8 high-resolution monitor. With the CM-8, you can achieve up to 160 × 192 or 320 × 192 resolution graphics using 16 colors, or 640 × 192 with 4 colors.

**Save on a disk drive.** To make the Color Computer 3 even more powerful, add a disk drive, now on sale for just $199.95. You can store over 156,000 characters of programs and data on 5¼" diskettes.

**Come in today!** The Color Computer 3 offers uncompromising performance at an incredible sale price.

**Tandy Computers: Because there is no better *gift* value.™**

Sale ends 12/24/88. Reg. $199.95. FD-502 Color Disk #0 reg. $299.95. Prices apply at Radio Shack Computer Centers and participating stores and dealers. Monitor platform sold separately.

**Radio Shack®**
**The Technology Store™**
A DIVISION OF TANDY CORPORATION

**Products listed in the Holiday Shopper's Guide (Page 41) are available from the following companies:**

Arizona Small Computer Peripherals
930 W. 23rd St., Suite 26
Tempe, AZ 85282
(602) 829-8028

Burke & Burke
P.O. Box 1283
Palatine, IL 60078
(312) 397-2898

CRC/Disto
10802 Lajeunesse
Montreal, Quebec
Canada H3L 2E8
(514) 383-5293

Cer-Comp
5566 Ricochet Ave.
Las Vegas, NV 89110
(702) 452-0632

Colorware
242-W West Ave.
Darien, CT 06820
(203) 656-1806

Curtis/PCA
1891 Goodyear Ave., Suite 622
Ventura, CA 93303
(805) 650-8020

Datum Manufacturing
12028 Venice Blvd.
Los Angeles, CA 90066
(213) 313-0141

Diecom Products, Inc.
6715 Fifth Line
Milton, Ontario
Canada L9T 2X8
(416) 878-8358

Foto-Wear!, Inc.
77 Milltown Road
East Brunswick, NJ 08816
(201) 257-6549

Gimmesoft
P.O. Box 421
Perry Hall, MD 21128
(301) 256-7558

(continued on Page 120)

```
7ECA 1Ø8E Ø4ØØ     ØØ31Ø COL8Ø   LDY     #$4ØØ
7ECE 86   36        ØØ32Ø         LDA     #$36
7EDØ B7   FFA1      ØØ33Ø         STA     $FFA1
                    ØØ34Ø *TRANSFER DATA FROM 32
                    ØØ35Ø *COLUMN SCREEN TO 4Ø-8Ø
                    ØØ36Ø *COLUMN SCREEN.
7ED3 A6   AØ        ØØ37Ø COPY    LDA     ,Y+
7ED5 81   1B        ØØ38Ø         CMPA    #27
7ED7 25   Ø6        ØØ39Ø         BLO     ADD96
7ED9 81   5A        ØØ4ØØ         CMPA    #9Ø
7EDB 22   Ø6        ØØ41Ø         BHI     ADD64
7EDD 2Ø   Ø6        ØØ42Ø         BRA     STORE
7EDF 8B   6Ø        ØØ43Ø ADD96   ADDA    #96
7EE1 2Ø   Ø2        ØØ44Ø         BRA     STORE
7EE3 8B   4Ø        ØØ45Ø ADD64   ADDA    #64
7EE5 A7   81        ØØ46Ø STORE   STA     ,X++
7EE7 1Ø8C Ø42Ø      ØØ47Ø         CMPY    #$42Ø
7EEB 26   E6        ØØ48Ø         BNE     COPY
                    ØØ49Ø *CLEAR CHAT FLAG
7EED B6   7F22      ØØ5ØØ         LDA     CHAT
7EFØ 26   Ø5        ØØ51Ø         BNE     GIMME
7EF2 86   6Ø        ØØ52Ø         LDA     #96
7EF4 B7   Ø41E      ØØ53Ø         STA     $41E
7EF7 86   39        ØØ54Ø GIMME   LDA     #$39
7EF9 B7   FFA1      ØØ55Ø         STA     $FFA1
7EFC B6   FFØ3      ØØ56Ø RETCO3  LDA     $FFØ3
7EFF 39             ØØ57Ø         RTS
                    ØØ58Ø *SET UP STRING AREA AND
                    ØØ59Ø *VARIABLES
7FØØ                ØØ6ØØ STRING  RMB     $15
7F15      ØØ        ØØ61Ø HOUR1   FCB     $ØØ
7F16      ØØ        ØØ62Ø HOUR2   FCB     $ØØ
7F17      ØA        ØØ63Ø COLON1  FCB     $ØA
7F18      ØØ        ØØ64Ø MIN1    FCB     $ØØ
7F19      ØØ        ØØ65Ø MIN2    FCB     $ØØ
7F1A      ØA        ØØ66Ø COLON2  FCB     $ØA
7F1B      ØØ        ØØ67Ø SEC1    FCB     $ØØ
7F1C      ØØ        ØØ68Ø SEC2    FCB     $ØØ
7F1D      ØØ        ØØ69Ø DAY     FCB     $ØØ
7F1E      ØØ        ØØ7ØØ CLOCK2  FCB     $ØØ
7F1F      ØØ        ØØ71Ø HOUR    FCB     $ØØ
7F2Ø      ØØ        ØØ72Ø DSPLAY  FCB     $ØØ
7F21      ØØ        ØØ73Ø DISPLN  FCB     $ØØ
7F22      ØØ        ØØ74Ø CHAT    FCB     $ØØ
7F23      32        ØØ75Ø CLKSPD  FCB     $32
7F24      ØØ        ØØ76Ø COUNT   FCB     $ØØ
                    ØØ77Ø *SET UP HOOKS
7F25 8E   7F33      ØØ78Ø INIT    LDX     #START
7F28 BF   Ø1ØD      ØØ79Ø         STX     $Ø1ØD
7F2B 86   35        ØØ8ØØ         LDA     #$35
7F2D B7   FFØ3      ØØ81Ø         STA     $FFØ3
7F3Ø 1C   EF        ØØ82Ø         ANDCC   #$EF
7F32 39             ØØ83Ø         RTS
                    ØØ84Ø *SET UP CLOCK TICK AND
                    ØØ85Ø *INCREMENT CLOCK
7F33 7C   7F24      ØØ86Ø START   INC     COUNT
7F36 B6   7F24      ØØ87Ø         LDA     COUNT
7F39 B1   7F23      ØØ88Ø         CMPA    CLKSPD
7F3C 25   6A        ØØ89Ø         BCS     DSPLY
7F3E 7F   7F24      ØØ9ØØ         CLR     COUNT
7F41 7C   7F1C      ØØ91Ø         INC     SEC2
7F44 B6   7F1C      ØØ92Ø         LDA     SEC2
```

# COMPUTER AIDED INSTRUCTION

Educational Programs for Students Grade K-12 and Adult Self Studies

# NEW PROGRAMS FOR YOUR TANDY 1000 AND TRS-80 COLOR COMPUTER

Compatible with Apple - Atari - Commodore - TRS 80 I, III, 4 - IBM PC Jr.

***16 New Programs now available in Basic Spanish***

## Interactive Tutorial Programs for Home or Classroom Use

**Over 1000 programs for your selection with 32 now available on disk for the Color Computer and 500 now available for the Tandy 1000.**

### "We're Your Educational Software Source"

| Subject | No. of Programs |
|---|---|
| Reading Development | 256 (4 on disk) |
| Reading Comprehension | 48 (4 on disk) |
| Mathematics | 128 |
| Algebra | 16 (16 on disk) |
| History | 32 (4 on disk) |
| Spelling | 16 |
| Government | 16 |
| Physics | 16 (4 on disk) |

### 16 Programs in each of the following:

Children's Tales - Carpentry - Electronics Health Services - Office Skills - Statistics First Aid/Safety - Economics - Business Accounting - Psychology - MUCH MORE!

Send for our free catalog of over 1000 Dorsett educational programs for Atari, TRS 80, Apple, IBM PC Jr., Commodore, Tandy 1000, etc.

Apple II, TRS 80 I, III, & 4, and Commodore 64 computers require respective conversion kits (plug-in board and stereo cassette player), **$99.00**. Atari 400/600/800/1200 computers require the Atari cassette recorder and the Dorsett 4001 Educational Master Cartridge, **$9.95**. For the IBM PC Jr. a cassette adapter cable and a good cassette recorder are required. The Tandy 1000 requires the Dorsett M1001 speaker/PC board kit, **$69.00**, and a standard cassette recorder. A Radio Shack CCR-81 or CCR-82 is recommended.

**CASSETTES: $59.50** for an album containing a 16-program course (8 cassettes with 2 programs each); $9.95 for a 2-program cassette.

**DISKS: $14.95** for a one-program disk; **$28.95** for two disks; **$48.95** for four disks. All disks come in a vinyl album.

Dealer Inquiries Welcome

**Dorsett Educational Software features:**

- Interactive Learning
- User Friendly
- Multiple Choice and Typed
- Program Advance with Correct Response
- Full-time audio narration (Cassette Programs Only)
- Self-Paced Study
- High Resolution Graphics
- Easy Reading Text

For more information, or to order call:

**TOLL FREE 1-800-654-3871**
**IN OKLAHOMA CALL (405) 288-2301**

MasterCard VISA

**DORSETT**
**Educational Systems, Inc.**
**Box 1226, Norman, OK 73070**

(continued from Page 118)

Howard Medical Computers
1690 N. Elston
Chicago, IL 60622
(800) 443-1444

MichTron
576 S. Telegraph
Pontiac, MI 48053
(313) 334-5700

The Micro Works
P.O. Box 1110
Del Mar, CA 92014
(619) 942-2400

Microcom Software
2900 Monroe Ave.
Rochester, NY 14618
(716) 383-8830

Nick Bradbury
10500 Sandpiper Lane
Knoxville, TN 37922
(615) 966-0172

RTB Software
P.O. Box 777 W.
Acton, MA 01720
(508) 263-0563

Simon & Schuster
1 Gulf+Western Plaza
New York, NY 10023
(212) 373-8142

Sundog Systems
21 Edinburg Drive
Pittsburgh, PA 15235
(412) 372-5674

Vidicom Corp.
20 E. Main St., Suite 710
Mesa, AZ 85201
(602) 827-0107

Zebra Systems, Inc.
78-06 Jamaica Ave.
Woodhaven, NY 11421
(718) 296-2385

```
7F47 81   ØA       ØØ93Ø          CMPA    #$ØA
7F49 25   5D       ØØ94Ø          BCS     DSPLY
7F4B 7F   7F1C     ØØ95Ø          CLR     SEC2
7F4E 7C   7F1B     ØØ96Ø          INC     SEC1
7F51 B6   7F1B     ØØ97Ø          LDA     SEC1
7F54 81   Ø6       ØØ98Ø          CMPA    #$Ø6
7F56 25   5Ø       ØØ99Ø          BCS     DSPLY
7F58 7F   7F1B     Ø1ØØØ          CLR     SEC1
7F5B B6   7F1E     Ø1Ø1Ø          LDA     CLOCK2
7F5E 81   ØØ       Ø1Ø2Ø          CMPA    #$ØØ
7F6Ø 27   Ø4       Ø1Ø3Ø          BEQ     START1
7F62 4A            Ø1Ø4Ø          DECA
7F63 B7   7F1E     Ø1Ø5Ø          STA     CLOCK2
7F66 7C   7F19     Ø1Ø6Ø START1   INC     MIN2
7F69 B6   7F19     Ø1Ø7Ø          LDA     MIN2
7F6C 81   ØA       Ø1Ø8Ø          CMPA    #$ØA
7F6E 25   38       Ø1Ø9Ø          BCS     DSPLY
7F7Ø 7F   7F19     Ø11ØØ          CLR     MIN2
7F73 7C   7F18     Ø111Ø          INC     MIN1
7F76 B6   7F18     Ø112Ø          LDA     MIN1
7F79 81   Ø6       Ø113Ø          CMPA    #$Ø6
7F7B 25   2B       Ø114Ø          BCS     DSPLY
7F7D 7F   7F18     Ø115Ø          CLR     MIN1
7F8Ø 7C   7F1F     Ø116Ø          INC     HOUR
7F83 7C   7F16     Ø117Ø          INC     HOUR2
7F86 B6   7F1F     Ø118Ø          LDA     HOUR
7F89 81   18       Ø119Ø          CMPA    #24
7F8B 25   ØE       Ø12ØØ          BCS     GO
7F8D 7F   7F1F     Ø121Ø          CLR     HOUR
7F9Ø 7F   7F15     Ø122Ø          CLR     HOUR1
7F93 7F   7F16     Ø123Ø          CLR     HOUR2
                   Ø124Ø *INCREMENT DAY FLAG
7F96 7C   7F1D     Ø125Ø          INC     DAY
7F99 2Ø   ØD       Ø126Ø          BRA     DSPLY
7F9B B6   7F16     Ø127Ø GO       LDA     HOUR2
7F9E 81   ØA       Ø128Ø          CMPA    #$ØA
7FAØ 25   Ø6       Ø129Ø          BCS     DSPLY
7FA2 7F   7F16     Ø13ØØ          CLR     HOUR2
7FA5 7C   7F15     Ø131Ø          INC     HOUR1
                   Ø132Ø *CHECK IF DISPLAY IS ON OR
                   Ø133Ø *OFF
7FA8 B6   7F2Ø     Ø134Ø DSPLY    LDA     DSPLAY
7FAB 26   31       Ø135Ø          BNE     RETURN
                   Ø136Ø *INCREMENT CHAT FLAG IF SET
7FAD B6   7F22     Ø137Ø          LDA     CHAT
7FBØ 27   Ø3       Ø138Ø          BEQ     DSPLYØ
7FB2 7C   Ø41E     Ø139Ø          INC     $41E
                   Ø14ØØ *DISPLAY STRING IF DISPLN SET
7FB5 B6   7F21     Ø141Ø DSPLYØ   LDA     DISPLN
7FB8 27   11       Ø142Ø          BEQ     DSPLY2
7FBA 8E   Ø4ØØ     Ø143Ø          LDX     #$4ØØ
7FBD 1Ø8E 7FØØ     Ø144Ø          LDY     #$7FØØ
7FC1 A6   AØ       Ø145Ø DSPLY1   LDA     ,Y+
7FC3 A7   8Ø       Ø146Ø          STA     ,X+
7FC5 1Ø8C 7F15     Ø147Ø          CMPY    #$7F15
7FC9 25   F6       Ø148Ø          BCS     DSPLY1
                   Ø149Ø *PRINT CURRENT TIME IF DISPLY SET
7FCB 8E   Ø416     Ø15ØØ DSPLY2   LDX     #$416
7FCE 1Ø8E 7F15     Ø151Ø          LDY     #$7F15
7FD2 A6   AØ       Ø152Ø DSPLY3   LDA     ,Y+
7FD4 8B   3Ø       Ø153Ø          ADDA    #$3Ø
7FD6 A7   8Ø       Ø154Ø          STA     ,X+
```

# DIGISECTOR DS-69B

# NEW VIDEO DIGITIZER FOR THE COCO 3

**(AND ALL OTHER COCOS . . .)**

## SUPER RESOLUTION !!!

COCO 3 SCREEN

**USE YOUR COCO 3 TO ITS FULL POTENTIAL!**
Use The Micro Works' DIGISECTOR™ DS-69 or DS-69B and your COCO 3's high resolution graphics to capture and display television pictures from your VCR or video camera. The DIGISECTOR™ systems are the only COCO video digitizers available that accurately capture and reproduce the subtle shades of gray in TV pictures!

- **COLOR:** Add color to your screen for dramatic special effects.
- **HIGH RESOLUTION:** 256 by *256 spatial resolution.*
- **PRECISION:** 64 levels of grey scale.
- **SPEED!** 8 images per second on DS-69B, 2 images per second DS-69.
- **COMPACTNESS:** Self contained in a plug-in Rompack.
- **EASY TO USE:** Software on disk will get you up and running fast!
- **COMPATIBLE:** Use with a black and white or color camera, a VCR or tuner.
- **INEXPENSIVE:** Our low price puts this within everyone's reach.

**POWERFUL C-SEE 3.3 SOFTWARE**

This menu-driven software will provide 5 and 16 shades of gray to the screen and to the printer with simple joystick control of brightness and contrast. Pictures taken by the DIGISECTOR™ may be saved on disk by C-SEE 3.3 and then edited by our optional MAGIGRAPH, or by COCO MAX or GRAPHICOM. This versatile new software is included in both DIGISECTORS™

| | |
|---|---|
| **DS-69B and C-SEE 3.3** | **$149.95** |
| **DS-69 and C-SEE 3.3** | **$ 99.95** |

**TRADE IN YOUR OLD DIGISECTOR™**
If you already have one of The Micro Works' DS-69 or DS-69A DIGISECTORS™, you may return it to us and we will upgrade your unit to a DS-69B.

| | |
|---|---|
| **UPGRADE DS-69A to DS-69B** | **$49.95** |
| **UPGRADE DS-69 to DS-69B** | **$69.95** |

The DS-69B comes with a one year warranty. Cameras and other accessories are available from The Micro Works. DS-88 version available for IBM PC.

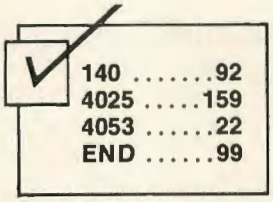
**NO RISK GUARANTEE**
If you are not completely satisfied with the performance of your new DS-69B, you may return it, undamaged, within ten days for a full refund of the purchase price. We'll even pay the return shipping. If you can get any of our competitors to give you the same guarantee, buy both and return the one you don't like. We know which one you'll keep.

Purveyors of Fine Video Digitizers Since 1977. THE MICRO WORKS

**Terms: Visa, Mastercard, Check or C.O.D.**

**P.O. Box 1110 Del Mar, CA 92014 (619) 942-2400**

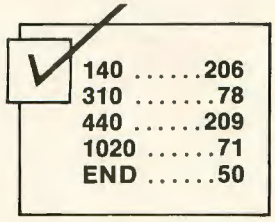
```
7FD8 1Ø8C 7F1D     Ø155Ø          CMPY    #$7F1D
7FDC 25   F4       Ø156Ø          BCS     DSPLY3
7FDE 17   FED3     Ø157Ø RETURN   LBSR    COCO3
7FE1 2A   1C       Ø158Ø          BPL     GO3
7FE3 B6   FFØ2     Ø159Ø          LDA     $FFØ2
7FE6 B6   Ø985     Ø16ØØ          LDA     $Ø985
7FE9 27   11       Ø161Ø          BEQ     GO4
7FEB 4A            Ø162Ø          DECA
7FEC B7   Ø985     Ø163Ø          STA     $Ø985
7FEF 26   ØB       Ø164Ø          BNE     GO4
7FF1 B6   Ø986     Ø165Ø          LDA     $Ø986
7FF4 84   BØ       Ø166Ø          ANDA    #$BØ
7FF6 B7   Ø986     Ø167Ø          STA     $Ø986
7FF9 B7   FF4Ø     Ø168Ø          STA     $FF4Ø
7FFC 7E   8955     Ø169Ø GO4      JMP     $8955
7FFF 3B            Ø17ØØ GO3      RTI
          ØØØØ     Ø171Ø          END

ØØØØØ TOTAL ERRORS
```




**Listing 3:** BASLOAD

```
1 'BASIC LOADER FOR REMOTE 3
5 CLEAR1ØØØ,&H7CFF
1Ø CLS(Ø):PRINT@171,"POKING M/L"
;
2Ø Z5=&H7DØØ:LN=3999:FORZ=1TO41:
READA$,B$:Z4=VAL("&H"+B$):LN=LN+
1
3Ø Z3=Ø:PRINT@228,"READING DATA
LINE"LN;:FORZ1=1TO LEN(A$) STEP2
4Ø Z2=VAL("&H"+MID$(A$,Z1,2)):Z3
=Z3+Z2:POKEZ5,Z2:Z5=Z5+1
5Ø NEXTZ1:IFZ3<>Z4 THENPRINT@416
,"DATA ERROR IN LINE"LN;:END
6Ø NEXTZ
7Ø Z5=&H7EB4:LN=4999:FORZ=1TO42:
READA$,B$:Z4=VAL("&H"+B$):LN=LN+
1
8Ø Z3=Ø:PRINT@228,"READING DATA
LINE"LN;:FORZ1=1TO LEN(A$) STEP2
9Ø Z2=VAL("&H"+MID$(A$,Z1,2)):Z3
=Z3+Z2:POKEZ5,Z2:Z5=Z5+1
1ØØ NEXTZ1:IFZ3<>Z4 THENPRINT@41
6,"DATA ERROR IN LINE"LN:END
11Ø NEXTZ
12Ø CLS(Ø)
13Ø SAVEM"REMOTE3.BIN",&H7DØØ,&H
7FFF,&H7D32
14Ø POKE65386,1Ø7:POKE65387,54'
CONFIGURE RS232 PAC FOR 7-E-1 @
3ØØ BAUD
15Ø CLS:EXEC&H7D32:PRINT"REMOTE
3 IS NOW INSTALLED AND   RUNNING
 AT 3ØØ BAUD!":END
4ØØØ DATA Ø1Ø1Ø1ØØØØØ9FØ4,A6
4ØØ1 DATA ØØØØFFFFFFFFFFFF,5FA
4ØØ2 DATA FFFFFFFFFFFFFFFF,7F8
4ØØ3 DATA FFFFFFFFFFFFFFFF,7F8
4ØØ4 DATA FFFFFFFFFFFFFFFF,7F8
4ØØ5 DATA FFFFFFFFFFFFFFFF,7F8
4ØØ6 DATA FFFFBEØ168AF8DØØ,461
4ØØ7 DATA 8BBEØ16BAF8DØØF1,3E2
4ØØ8 DATA 867EB7Ø167B7Ø16A,345
4ØØ9 DATA 3Ø8DØØ48BFØ1683Ø,25D
4Ø1Ø DATA 8DØØ73BFØ16B8EAA,363
4Ø11 DATA 29318CAE1ØBFØ128,28C
4Ø12 DATA EC81EDA18CAA5126,4A8
4Ø13 DATA F73Ø8DØØ5313CAF,2D5
4Ø14 DATA A4399687261586FF,3BA
4Ø15 DATA B77DØ9AD9FAØØ26,34F
4Ø16 DATA ØABD7DE626Ø57A7D,34C
4Ø17 DATA Ø926FØ81Ø31Ø273Ø,2ØA
4Ø18 DATA 787EA56B34Ø6ØD6F,2BC
4Ø19 DATA 262781Ø8271A81ØD,1A5
4Ø2Ø DATA 26ØEF67DØ2271186,267
4Ø21 DATA ØABD7E3386ØD2ØØ8,233
4Ø22 DATA F67DØ327Ø3B67DØ3,2D6
4Ø23 DATA F67DØ5BD7EØABD7E,3F8
4Ø24 DATA 3335Ø67E7D71B67D,3ØD
4Ø25 DATA Ø6A79FØØ88ØF7ØØD,26Ø
4Ø26 DATA 6F265D32623415AD,27C
4Ø27 DATA 9FAØØ27Ø22Ø4FBD,294
4Ø28 DATA 7DE627F32Ø42F6FF,4D4
4Ø29 DATA 69C4Ø82718C4Ø726,265
4Ø3Ø DATA 14B6FF68F67DØ127,3CC
4Ø31 DATA Ø3B7Ø41FF67DØØ27,277
4Ø32 DATA Ø681Ø326Ø24F39F6,23Ø
4Ø33 DATA 7DØ4C1Ø126ØB8161,256
4Ø34 DATA 2515817A22118Ø2Ø,2Ø8
4Ø35 DATA 39C1Ø226ØA814125,213
4Ø36 DATA Ø6815A22Ø28B2Ø39,1E9
```

```
4Ø37 DATA C66ØE79FØØ883595,3FE
4Ø38 DATA 7E7D7134Ø4F6FF69,4Ø2
4Ø39 DATA C41Ø27F9B7FF6835,447
4Ø4Ø DATA Ø439FF,13C
4Ø41 DATA BEEØØØ8CØØE6264Ø,376
4Ø42 DATA 96E7273C8E2F6Ø81,37E
4Ø43 DATA Ø227Ø38E279Ø1Ø8E,2ØF
4Ø44 DATA Ø4ØØ8636B7FFA1A6,3BD
4Ø45 DATA AØ811B25Ø6815A22,264
4Ø46 DATA Ø62ØØ68B6Ø2ØØ28B,1C4
4Ø47 DATA 4ØA7811Ø8CØ42Ø26,24E
4Ø48 DATA E6B67F2226Ø5866Ø,34E
4Ø49 DATA B7Ø41E8639B7FFA1,3EF
4Ø5Ø DATA B6FFØ3395254434C,326
4Ø51 DATA 4F434B2Ø42592Ø5Ø,2Ø8
4Ø52 DATA 41554C2Ø414C4745,21B
4Ø53 DATA 52ØØØØAØØØØAØØ,66
4Ø54 DATA ØØØØØØØØØØØØØ32,32
4Ø55 DATA ØØ8E7F33BFØ1ØD86,293
4Ø56 DATA 35B7FFØ31CEF397C,3AE
4Ø57 DATA 7F24B67F24B17F23,34F
4Ø58 DATA 256A7F7F247C7F1C,2C8
4Ø59 DATA B67F1C81ØA255D7F,2DD
4Ø6Ø DATA 7F1C7C7F1BB67F1B,3Ø1
4Ø61 DATA 81Ø6255Ø7F7F1BB6,2CB
4Ø62 DATA 7F1E81ØØ27Ø44AB7,24A
4Ø63 DATA 7F1E7C7F19B67F19,2FF
4Ø64 DATA 81ØA25387F7F197C,27B
4Ø65 DATA 7F18B67F1881Ø625,29Ø
4Ø66 DATA 2B7F7F187C7F1F7C,2D7
4Ø67 DATA 7F16B67F1F811825,2A7
4Ø68 DATA ØE7F7F1F7F7F157F,2BD
4Ø69 DATA 7F167C7F1D2ØØDB6,29Ø
4Ø7Ø DATA 7F1681ØA25Ø67F7F,249
4Ø71 DATA 167C7F15B67F2Ø26,2A1
4Ø72 DATA 31B67F2227Ø37CØ4,232
4Ø73 DATA 1EB67F2127118EØ4,23E
4Ø74 DATA ØØ1Ø8E7FØØA6AØA7,3ØA
4Ø75 DATA 8Ø1Ø8C7F1525F68E,359
4Ø76 DATA Ø4161Ø8E7F15A6AØ,292
4Ø77 DATA 8B3ØA78Ø1Ø8C7F1D,31A
4Ø78 DATA 25F417FED32A1CB6,3FD
4Ø79 DATA FFØ2B6Ø98527114A,2C7
4Ø8Ø DATA B7Ø98526ØBB6Ø986,2BB
4Ø81 DATA 84BØB7Ø986B7FF4Ø,47Ø
4Ø82 DATA 7E89553B,197
```




**Listing 4:** REMDEMO

```
1Ø CLEAR2ØØ,&H7CFF
2Ø DEFUSRØ=&H7F25'CLOCK PROGRAM
START
25 CLS:PRINT
```


The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE

# Back Issue Availability

For greater convenience, order RAINBOW Back Issues through the Rainbow Magazine Services area of our Delphi CoCo SIG.

**BACK ISSUES STILL AVAILABLE**

Have you explored the wealth of information in our past issues? From our very first, four-page issue to many with more than 300 pages of material, it's all just for CoCo users — a great way to expand your library!

**A WORLD OF INFO AT A BARGAIN PRICE**

All back issues sell for the single issue cover price. In addition, there is a $3.50 charge for the first issue, plus 50 cents for each additional issue for postage and handling if sent by United Parcel Service. There is a $5 charge for the first issue, plus a $1 charge for each additional issue on orders sent by U.S. Mail. UPS *will not* deliver to a post office box or to another country.

**MOST ISSUES STILL AVAILABLE**

Issues July 1981 through June 1982 are available on white paper in a reprint form. All others are in regular magazine form. VISA, MasterCard and American Express accepted. Kentucky residents please add 5 percent state sales tax. In order to hold down costs, we do not bill, and no C.O.D. orders are accepted.

Due to heavy demand, we suggest you order the back issues you want now while supplies last.

To check availability and order, review and fill out the form on the next page and mail it with your payment to:

**THE RAINBOW**
The Falsoft Building
P.O. Box 385
Prospect, KY 40059

## BACK ISSUE ORDER FORM

(See overleaf for instructions.)

Please send me the following back issues:

| MONTH/YEAR | | PRICE | |
|---|---|---|---|
| | **VOLUME 1** | | |
| JUL '81 | Premier Issue | $2.00 | ☐ |
| AUG '81 | | $2.00 | ☐ |
| SEP '81 | Education | $2.00 | ☐ |
| OCT '81 | Printer | $2.00 | ☐ |
| NOV '81 | | $2.00 | ☐ |
| DEC '81 | Holiday | $2.00 | ☐ |
| JAN '82 | | $2.00 | ☐ |
| FEB '82 | | $2.00 | ☐ |
| MAR '82 | | $2.50 | ☐ |
| APR '82 | | $2.50 | ☐ |
| JUN '82 | | $2.50 | ☐ |
| | **VOLUME 2** | | |
| JUN '83 | Printers | $2.95 | ☐ |
| JUL '83 | Anniversary | $2.95 | ☐ |
| | **VOLUME 3** | | |
| AUG '83 | Games | $2.95 | ☐ |
| SEP '83 | Education | $2.95 | ☐ |
| OCT '83 | Graphics | $3.95 | ☐ |
| DEC '83 | Holiday | $3.95 | ☐ |
| MAR '84 | Business | $3.95 | ☐ |
| APR '84 | Gaming | $3.95 | ☐ |
| MAY '84 | Printer | $3.95 | ☐ |
| JUN '84 | Music | $3.95 | ☐ |
| JUL '84 | Anniversary | $3.95 | ☐ |
| | **VOLUME 4** | | |
| AUG '84 | Games | $3.95 | ☐ |
| SEP '84 | Education | $3.95 | ☐ |
| OCT '84 | Graphics | $3.95 | ☐ |
| NOV '84 | Data Comm. | $3.95 | ☐ |
| DEC '84 | Holiday | $3.95 | ☐ |
| JAN '85 | Beginners | $3.95 | ☐ |
| FEB '85 | Utilities | $3.95 | ☐ |
| MAR '85 | Business | $3.95 | ☐ |
| APR '85 | Simulations | $3.95 | ☐ |
| MAY '85 | Printer | $3.95 | ☐ |
| JUN '85 | Music | $3.95 | ☐ |
| JUL '85 | Anniversary | $3.95 | ☐ |

| MONTH/YEAR | | PRICE | |
|---|---|---|---|
| | **VOLUME 5** | | |
| AUG '85 | Games | $3.95 | ☐ |
| SEP '85 | Education | $3.95 | ☐ |
| OCT '85 | Graphics | $3.95 | ☐ |
| NOV '85 | Data Comm. | $3.95 | ☐ |
| JAN '86 | Beginners | $3.95 | ☐ |
| FEB '86 | Utilities | $3.95 | ☐ |
| MAR '86 | Business | $3.95 | ☐ |
| APR '86 | Home Help | $3.95 | ☐ |
| MAY '86 | Printer | $3.95 | ☐ |
| JUN '86 | Music | $3.95 | ☐ |
| JUL '86 | Anniversary | $3.95 | ☐ |
| | **VOLUME 6** | | |
| AUG '86 | Games | $3.95 | ☐ |
| SEP '86 | Education | $3.95 | ☐ |
| OCT '86 | Graphics | $3.95 | ☐ |
| NOV '86 | Data Comm. | $3.95 | ☐ |
| DEC '86 | Holiday | $3.95 | ☐ |
| JAN '87 | Beginners | $3.95 | ☐ |
| FEB '87 | Utilities | $3.95 | ☐ |
| MAR '87 | Business | $3.95 | ☐ |
| APR '87 | Home Help | $3.95 | ☐ |
| MAY '87 | Printer | $3.95 | ☐ |
| JUN '87 | Music | $3.95 | ☐ |
| JUL '87 | Anniversary | $3.95 | ☐ |
| | **VOLUME 7** | | |
| AUG '87 | Games | $3.95 | ☐ |
| SEP '87 | Education | $3.95 | ☐ |
| OCT '87 | Graphics | $3.95 | ☐ |
| NOV '87 | Data Comm. | $3.95 | ☐ |
| DEC '87 | Holiday | $3.95 | ☐ |
| JAN '88 | Beginners | $3.95 | ☐ |
| FEB '88 | Utilities | $3.95 | ☐ |
| MAR '88 | Business | $3.95 | ☐ |
| APR '88 | Home Help | $3.95 | ☐ |
| MAY '88 | Printer | $3.95 | ☐ |
| JUN '88 | Music | $3.95 | ☐ |
| JUL '88 | Anniversary | $3.95 | ☐ |
| | **VOLUME 8** | | |
| AUG '88 | Games | $3.95 | ☐ |
| SEP '88 | Education | $3.95 | ☐ |
| OCT '88 | Graphics | $3.95 | ☐ |
| NOV '88 | Data Comm. | $3.95 | ☐ |

**RAINBOW INDEX** A complete index to the first three years, July 1981 through June 1984, is printed in the July 1984 issue. Separate copies are available for $2.50 ☐

The Fourth, Fifth and Sixth Year Indexes including RAINBOW ON TAPE are printed in the July 1985, 1986 and 1987 issues, respectively. The Seventh Year Index is printed in the July 1988 issue.

TOTAL _____

KY RESIDENTS ADD 5% _____

U.S. MAIL CHARGE _____
SHIPPING & HANDLING
U.P.S. CHARGE _____
**TOTAL AMOUNT ENCLOSED** _____

**Article Reprints**

In instances where a given issue is now out of print and not available for purchase, we do provide photocopies of specific articles. The cost for this service is $1.50 plus 50 cents S/H per article. This service is provided *only* in the case of out-of-stock issues.

Name _____

Address _____

City _____ State _____ ZIP _____

☐ Payment Enclosed, or
Charge to my: ☐ VISA ☐ MC ☐ AE

CARD # _____

EXPIRATION DATE _____ PHONE (  ) _____

SIGNATURE _____

**TO ORDER BY PHONE** (credit card orders only) call (800) 847-0309, 8 a.m. to 5 p.m. EST. All other inquiries call (502) 228-4492.

```
26 PRINT"IS REMOTE 3 INSTALLED?"
:LINEINPUTA$:IFLEFT$(A$,1)="Y"TH
EN4Ø
3Ø LINEINPUT"ENTER FILENAME OF R
EMOTE3       PROGRAM. ";FI$:LOAD
M FI$:FORZ=1TO1ØØØ:NEXT:EXEC
4Ø POKE65386,1Ø7:POKE65387,54'SE
T RS232 PAC AT 7-E-1, 3ØØ BAUD
6Ø A=USRØ(Ø)'START CLOCK
7Ø PRINT"ENTER CURRENT TIME AS 2
4 HOUR   MILITARY TIME.":PRINT"E
NTER HOUR ";:LINEINPUTH$:H=VAL(H
$):PRINT"ENTER MINUTES ";:LINEIN
PUTM$:M=VAL(M$)
8Ø '*** CHECK FOR PROPER INPUT *
**
9Ø IFH<Ø OR H>23 OR M<Ø OR M>59
THEN7Ø
1ØØ IF H>9 THENH1=VAL(LEFT$(H$,1
)) ELSEH1=Ø
11Ø H2=VAL(RIGHT$(H$,1))
12Ø IF M>9 THEN M1=VAL(LEFT$(M$,
1)) ELSE M1=Ø
13Ø M2=VAL(RIGHT$(M$,1))
14Ø '*** POKE CURRENT TIME TO CL
OCK ***
15Ø POKE&H7F15,H1:POKE&H7F16,H2:
POKE&H7F18,M1:POKE&H7F19,M2:POKE
&H7F1F,H:POKE&H7F1B,Ø:POKE&H7F1C
,Ø
16Ø INPUT"COCO 3";C$:IFLEFT$(C$,
1)="Y"THENGOSUB1ØØØ
2ØØ MOTORON:POKE65387,54:IFC$="Y
"THENCLS(2) ELSE CLS(Ø)
21Ø K=PEEK(65385) AND 32:IFK=ØTH
EN23Ø
22Ø IF PEEK(&H152)<>255 THENPOKE
B+253,1:MOTOROFF:POKE65387,63:X=
192ØØ:GOTO24Ø ELSE 21Ø
23Ø X=3ØØ
24Ø '**** SOMEONE IS LOGGING ON
****
245 POKE&H7F2Ø,Ø:POKE&H7F21,1'TU
RN ON NAME AND CLOCK DISPLAY
25Ø PRINT"CONNECTED AT"X:FORZ=1T
O8ØØ:NEXT
26Ø IFC$="Y"THEN WIDTH8Ø
3ØØ PRINTCHR$(12):CLS:PRINT"Remo
te 3 demo.":PRINT:PRINT"Who am I
 talking to? ";:LINEINPUTNA$
3Ø2 POKE&H7F1E,1Ø'SET 1Ø MINUTE
TIME LIMIT
3Ø5 '*** POKE NAME INTO CLOCK FO
R CLS AND SCROLL PROTECT ***
31Ø IF LEN(NA$)>21 THEN NA$=LEFT
$(NA$,21) ELSE NA$=NA$+STRING$(2
1-LEN(NA$),32)
32Ø FORZ=1TO LEN(NA$):Z1=ASC(MID
$(NA$,Z,1)):IFZ1>96 THEN Z1=Z1-9
```

```
6 ELSE IFZ1>31 AND Z1<64 THENZ1=
Z1+64
33Ø L=&H7EFF+Z:POKE L,Z1:NEXT
34Ø '*** MAIN MENU ***
35Ø PRINT:PRINT"MAIN MENU":PRINT
:PRINT"[1] Toggle Chat flag":PRI
NT"[2] Toggle Clock display":PRI
NT"[3] Toggle String display":PR
INT"[4] Toggle Inverse":PRINT"[5
] Change Clock speed"
351 PRINT"[6] Log off":PRINT
36Ø GOTO2ØØØ' CHECK TIME LEFT
4ØØ PRINT:PRINT"Enter choice>> "
;:LINEINPUTZ$:Z=VAL(Z$)
41Ø IFZ$="?"THEN35Ø
42Ø IFZ=1 AND PEEK(&H7F22)=Ø THE
N POKE&H7F22,1:PRINT"Chat flag o
n!":GOTO35Ø ELSE IFZ=1 THEN POKE
&H7F22,Ø:PRINT"Chat flag off!":G
OTO35Ø
43Ø IFZ=2 AND PEEK(&H7F2Ø)=Ø THE
NPOKE&H7F2Ø,1:GOSUB21ØØ:PRINT:PR
INT"CLOCK DISPLAY OFF":GOSUB22ØØ
:GOSUB215Ø:GOTO35Ø ELSE IF Z=2 A
ND PEEK(&H7F2Ø)=1THENPOKE&H7F2Ø,
Ø:GOSUB21ØØ:PRINT:PRINT"CLOCK DI
SPLAY ON":GOSUB22ØØ:GOSUB215Ø:GO
TO35Ø
44Ø IFZ=3 AND PEEK(&H7F21)=1THEN
POKE&H7F21,Ø:GOSUB21ØØ:PRINT:PRI
NT"STRING DISPLAY OFF":GOSUB22ØØ
:GOSUB215Ø:GOTO35Ø ELSE IFZ=3THE
NPOKE&H7F21,1:GOSUB21ØØ:PRINT:PR
INT"STRING DISPLAY ON":GOSUB22ØØ
:GOSUB215Ø:GOTO35Ø
45Ø IFZ=4THENGOSUB21ØØ:GOSUB3ØØØ
:GOSUB215Ø:GOTO35Ø
46Ø IFZ=5THENP=PEEK(&H7F23):PRIN
T"Current clock speed"P:PRINT"Th
e larger the number, the slower
the clock.":PRINT"Enter new cloc
k speed ";:LINEINPUTA$:P=VAL(A$)
:POKE&H7F23,P:PRINT"Clock now at
"P:GOTO35Ø
47Ø IFZ=6THENPRINT"BYE!!":MOTORO
FF:FORZ=1TO2ØØØ:NEXT:GOSUB31ØØ:G
OTO2ØØ
5ØØ PRINT"HUH??":GOTO35Ø
1ØØØ '*** SET UP 4Ø AND 8Ø COL S
CREENS IF COCO 3 ***
1Ø1Ø POKE&HEØ3D,PEEK(&HEØ3D) OR
&H2Ø:POKE&HEØ46,PEEK(&HEØ46) OR
&H2Ø:POKE&HF8F4,&H19'THESE POKES
 SET UP SCROLL AND CLS PROTECTED
 AREA ON 4Ø AND 8Ø COL SCREENS
1Ø2Ø WIDTH8Ø:PALETTE8,48:PALETTE
4,Ø:PALETTE1,Ø:CLS2'SET BLACK BA
CKGROUND WITH BUFF LETTERS
1Ø3Ø LOCATEØ,24:ATTRØ,2:PRINT:AT
TRØ,1'CLEAR SCROLL PROTECTED ARE
A ON 8Ø COLUMN SCREEN
1Ø4Ø POKE&H415,96'PUT A SPACE BE
TWEEN STRING AND CLOCK ON 32 COL
 SCREEN
1Ø5Ø WIDTH32:CLS(2):RETURN
2ØØØ ' *** CHECK TIME LEFT ***
2Ø1Ø T=PEEK(&H7F1E):IFT=Ø THENPR
INT"Time limit is up!":GOTO2ØØ
2Ø15 PRINTPEEK(&H7F1D)"day(s) ha
ve elapsed."
2Ø2Ø PRINTT"minutes left":GOTO4Ø
Ø
21ØØ '*** SEE IF COCO 3 ***
211Ø IFC$="Y"THENWIDTH32:RETURN
ELSE RETURN
215Ø IFC$="Y"THENWIDTH8Ø:RETURN
ELSE RETURN
22ØØ LINEINPUT"HIT ENTER TO CONT
INUE";A$:RETURN
3ØØØ PRINT:PRINT"Q TO QUIT OR AN
Y KEY TO TOGGLE"
3Ø1Ø Z$=INKEY$:IFZ$=""THEN3Ø1Ø
3Ø2Ø IFZ$="Q"THENRETURN
3Ø3Ø IF PEEK(&H7FD5)=48THENPOKE&
H7FD5,112 ELSE POKE&H7FD5,48
3Ø4Ø GOTO3Ø1Ø
31ØØ IFC$="Y"THENWIDTH32:CLS(2)
311Ø POKE&H7F2Ø,1:PRINT:RETURN
```


# BEST

**WE'VE CHOSEN THE BEST OF OVER 760 PROGRAMS (OVER 6 YEARS OF ACCUMULATING FINE SOFTWARE), AND PACKAGED THEM FOR YOU. 12 PROGRAMS EACH PACKAGE. COLOR COMPUTER I, II or III. SPECIFY TAPE OR DISK. ONLY $29.95 EACH PACKAGE! 5 NEW ONES!**

**#1 Home Mgmt I**
Budget
Checkbook Balancer
Cost of Living
Tinycalc Spreadsheet
Electronic Datebook
Account Manager
Stock Market
Word Processor
Lottery Analyst
Coco Database
Coco Terminal
Bartender

**#2 Education**
Flash Card
Spanish Lessons
Typing Tutor
Creativity Test
Arith. Football
Cost of Living
Math Tutors 1, 2
Trigonometry Tutor
Typing Game
Word Tests
Talking Alphabet
Clown Dunk Math

**#3 Adventures II**
Dungeon Master
Hired, Tired, Fired
Iceworld
Jungle
Keys
Amulet of Power
The Trip
Cookies
Barracks
Genesis Project
Rambo
Zigma Experiment
NEW

**#4 Business Helper**
Workmate
Word Processor
Spreadsheet
Calendar
Accounts Receivable
Accounts Payable
Income Property
Mail List
Small Business Helper
Stock Charting
Job Log
Asset Manager
DISK ONLY

**#5 Games III**
Sandy Rover
Gray Lady
Flippy The Seal
Abie Builders
Panzer
Mrs. Pac
Fire Runner
Cosmic Rays
Dig
Battle Tank
Kron
King Pede
NEW

**#6 Electronics Tutorial**
Electronics 1 + 2
Electronics 3 + 4
Electronics 5 + 6
Electronics 7 + 8
Electronics 9 + 10
Electronics 11 + 12
Electronics 13
Electronics 14
Electronics 15
Electronics 16
Electronics 17
Electronics 18
NEW

**#7 Machine Lang. Tut.**
Basic Compiler
ML Tutorial Pt. 1
ML Tutorial Pt. 2
ML Tutorial Pt. 3A, 3B
ML Tutorial Pt. 4
ML Tutorial Pt. 5
ML Tutorial Pt. 6
ML Tutorial Pt. 7
ML Tutorial Pt. 8
MLT Dictionary
Coco Technical Look
Coco Technical Look Pts. 1-3

**#8 Gamble Issue**
Horse Racing
Rack Track
Black Jack
Slot Machine
Lottery Analyst
Coco Keeno
Lucky Money
Betting Pool
Baccarat
Draw Poker
Turtle Races
Hi-Lo Craps
NEW

**#9 Coco 3 Only**
Paint Coco 3
Convert Coco 3
Demon's Castle
Function Keys
Bowling 3
Coco 3 ◗ Coco 2
Wizard
Coco 3 Drawer
H-Res Chess
FYR-Draca 3
Whammy 3
Coco 3 Screen Print
NEW

MasterCard VISA T&D

**29.95 EACH SET**
★ Special This Month ★
Buy 2 Packages and get 1 FREE

RAINBOW CLASSIFICATION

TURN TO PAGES 22 & 23 FOR A COMPLETE LISTING OF ALL OUR PROGRAMS.

T & D Subscription Software • 2490 Miles Standish Dr. • Holland, MI 49424 • (616) 399-9648

Software/Hardware

CoCo 1, 2 & 3

# *Vocal Freedom* — CoCo Claims the First Amendment!

Imagine coming home one day and calling out, "Hello, is anyone home?" as usual. Suddenly, your best friend's voice answers, "Hi, I am speaking to you from inside your Color Computer! I decided to do a little experimenting, and I must have done something wrong, because here I am inside!"

Then you hear your dog barking and your friend telling him to be quiet. You're beginning to be more than a little curious, because it really *does* sound like your friend's and your dog's voice coming from a machine. You go into the next room and see your beloved Color Computer on. Just as you clear the door it says, "I know this is a little hard to believe, but it's really my voice talking to you, and I'm getting kind of hungry, so I want to come out. You better not shut the computer off, or I might disappear forever!"

Well, the barely controlled giggling from the closet indicates that your friend is not *really* in the computer, and Fido's wagging tail reassures you that he's OK, too. But you *have* to know — what is this amazing new device that makes your CoCo sound exactly like your best friend? You don't have long to wait, for soon the numbers on the display stop moving, the screen flashes red and a stranger's voice says, "*Vocal Freedom* is ready!"

Imagine being able to write a program in BASIC and include sound effects like the whine of a jet fighter plane or the plunk of a piano. Or even a person talking and laughing or singing. Imagine the capability for a myriad of sound effects and human voices loaded into memory from file after file and played back at different speeds or in different orders, or all at once. And this is no cheap imitation — this is the real thing; whatever it is that the computer has heard, it will reproduce.

OK, you say, what is this amazing device, this *Vocal Freedom*? It's a software/hardware package from Dr. Preble's Programs that turns the Color Computer into a digital voice recorder (DVR). DVR is the same recording principle used in compact disc players.

*Vocal Freedom* runs on the CoCo 1, 2 or 3 with at least one disk drive. In

addition to the DVR program, you can also buy a companion program called *Vocal Freedom Hacker's Pac*, which consists of a "programmers toolkit" for special effects used in conjunction with two demonstration programs (one for a 64K CoCo and the other for a 512K CoCo 3).

In addition to the disk and documentation, you also receive a special cable that connects between the right joystick port and an amplifier. Amplifier, you ask? Yes, a small mini speaker/amplifier is required to run *Vocal Freedom*, along with any simple dynamic or electret microphone (like you'd find in a portable tape recorder). The amplifier and microphone are not included in the package, so you'll need to buy them separately. Both are available from Radio Shack. The amplifier (Cat. No. 277-1008), which costs $11.95, is a battery-operated audio amplifier with a built-in speaker.

The microphone can be any one of many different kinds. Radio Shack also sells these, starting at $18. As long as it will plug into the miniature phone jack on the speaker/amplifier, it will work. I recommend the Radio Shack 200-ohm dynamic microphone. It is inexpensive, but effective. If you are going to be getting serious with this product, naturally you are going to want a better amplifier and microphone. And if you have a CoCo 3 or a monitor driver on an older CoCo, you will be able to redirect the sound output to high-quality speakers instead of the TV or monitor speaker.

*Vocal Freedom* gives you many different options, which are presented in the form of a main menu. The program always returns to the main menu after it has completed a task for you. There are several allowances for using the CoCo 1 and 2 within the framework of this menu structure. One is an option that lets you use the CoCo 1 and 2 memory map. There is also an option that allows the use of the CoCo 3 extended memory map. Basically, the more memory you have, the more recording time you have.

Another option lets you use the high-speed or high-fidelity mode. This is not just a feature for CoCo 3 users, though, as one might expect; many of the older CoCos are capable of the high-speed mode. I tested an older CoCo 2, and it ran in high speed just fine. This feature makes the 6809 CPU chip run at twice normal speed. It is called "high-fidelity" because it allows the computer to sample input at a rate of 8,000 times a second instead of 4,000. This is an important feature, because it makes for a significant difference in quality on playback.

High-fidelity is a must for quality sound reproduction. While Dr. Preble notes in the manual that 4,000 ADC (analog-to-digital conversions) per second is adequate to recognize speech, anyone with the high-fidelity capability in the CoCo would very likely not want to use the low-speed mode. Remember that each sample uses a byte of memory, so memory will get eaten up twice as fast in high-speed mode. This still allows for several contiguous minutes of speech in memory at a time.

Another important thing to remember, however, is that if you fill up 512K of memory with sound and want to save it, you have to have 512K of disk space to put it on! Either that or you must create small files using the CoCo 1 and 2 memory map option. For programmers who might want to include speech or sound in their programs, the 64K files would be a must.

Besides the regular playback mode, there are two other important features of *Vocal Freedom* you should know about. First is the voice-activated playback option. If you select this mode, CoCo will instantly play back anything stored in memory when it hears a noise in the room. (Note the opening lines of this review as an example of this exciting feature.)

The second important feature is the option that lets you set the sound recording level. This option allows users to set the level of their amplifiers for optimum sound recording accuracy. This is accomplished by the computer requesting that you speak into the microphone repeatedly and then adjust the volume control.

After six adjustments or more the computer will inform you that the

## What is Digital Voice Recording?

*Vocal Freedom* and *Hacker's Pac* are more than just run-of-the-mill programs for the CoCo 1, 2 and 3. They comprise a sophisticated software package that includes a digital voice recording program and a set of machine language programs to utilize the power behind the system. What *is* digital voice recording?

Imagine if you will that the computer sees your voice as electrical charges after it is input from an amplified microphone. These charges are sampled or read by the computer either 4,000 times per second in slow mode or more than 8,000 times per second on a high-speed CoCo 3. That's an awful lot of reading to remember! This process has a name — analog-to-digital conversion.

In this process, an actual number value, such as the number of millivolts in a frequency, is converted into a number that the computer understands, a number composed of ones and zeros — a binary number. When data is presented in binary format, the computer can make sense of what it is seeing and hearing.

In order to reproduce what it has seen and heard in a human-understandable format, the computer must take all the numbers it has recorded and convert them back into the actual frequencies they represent, then send them to a speaker like the one in your monitor or TV set.

Dr. Preble suggests in his manual that you think of DVR as a series of snapshots the computer takes and arranges almost like a connect-the-dots picture. The more dots there are, the closer together, the more realistic the "vocal picture" will look when the computer recreates exactly what it has recorded.

This is the same principle at work with compact disc players. CD players sample a sound 40,000 times a second, though, which is 10 times faster than the average CoCo can, and which is why some CD players sound so realistic. They can play back a very accurate reproduction of the frequencies they have heard. □

# The Amazing Dr. Preble and his Programs

Like so many other companies in the Color Computer Community, Dr. Preble's Programs has some fascinating and humble roots indeed. The CoCo Community has been supported largely by America's "cottage industry," which is best characterized by hobbyists with entrepreneurial designs inventing something on the dining room table in hot pursuit of what no one else has done before.

Before they know it, there is interest in their breakthrough. Then they create a little company, buy a little advertising in a trade journal, and pretty soon — a star is born. Apple's famous Steve Jobs is a prime example of this. So is Dr. Preble's Programs, and here is that story . . . .

In 1969, there were very few computers around, and most of them filled up large rooms and were owned and operated by the military. Laurence Preble, then an aspiring hobbyist, built for himself a microcomputer from a kit sold by Southwest Tech.

The kit was a 6809-based computer with about 4K of memory, although it was soon upgraded to 24K. Its next upgrade was to 56K, and that is what it has right now — Dr. Preble is still using that computer, having it perform patient functions in his professional chiropractic office. It stores information on 8-inch Qume drives, also from a bygone era, and has a speech synthesizer attached to it.

Dr. Preble's Programs actually began in 1978 when he wrote a program in 6809 machine code and advertised it in the then fledgling *Computer Shopper* magazine. The program was called *Fast Sort*. Shortly thereafter, Dr. Preble became interested in speech synthesis and built his own hardware kit, programming speech phonemes (the actual elements of sound that go together to create speech) into the 6809 computer by hand. Two great and wonderful things occurred next. First, a company called Votrax developed a speech synthesis chip called the SC02, and second, Tandy invented the Color Computer.

Dr. Preble was a hardware hacker through-and-through and could not resist the temptation of this $600-plus machine with its wonderful graphics and exciting sound capabilities. He immediately purchased one and began to work diligently with it. His next hurdle was in 1983 when he wanted to obtain a disk drive; it, too, was in the $600-plus price range.

Instead, he determined to utilize the upper memory bank in his CoCo to work as a fast disk drive by storing programs there in a slightly compressed format. To that end, Dr. Preble wrote a program to utilize the unused areas of the CoCo's memory. The program was called *VDOS*, and it helped to boost Dr. Preble's Programs into the ranks of the dedicated contributors to a rapidly growing CoCo Community.

A veteran RAINBOWfest exhibitor, Dr. Preble continued developing programs for the Color Computer from his well-spring of a truly unique background. One of Dr. Preble's CoCos is now utilizing *Vocal Freedom*'s speech recognition capability and the program *Ears* from Speech Systems (along with a variety of other devices) to run his burglar alarm — and also to open doors, turn on lights and run the intercom system in his house!

As a chiropractor, Dr. Preble studied biofeedback. After completing some work with electrobiometers and galvanic skin response sensing, he took an eclectic approach toward curing patients who were suffering from back pain. He then wrote *Mental Freedom*, a fascinating video game program that reacts to a person's level of stress by using the computer to measure galvanic skin response.

In addition to his private practice as a chiropractor, Dr. Preble is a private pilot and uses his Tandy Model 100 computer for flight planning. He also has the distinct pleasure of having taught our beloved editor and publisher, Lonnie Falk, how to fly.

Dr. Preble said he is very committed to serving the CoCo Community in the months and years to come. He remains fascinated by the impressive and flexible Color Computer and is looking forward to developing ever newer and more innovative software for it. □

sound recording level is correctly set. This is important because if the recording level is set low, the computer will not hear you or will fade in and out and miss words. Conversely, if the volume is set too loud on the amplifier, you can overdrive the recording level and produce very distorted and garbled results. Careful attention to this feature is a necessity!

The documentation that accompanies *Vocal Freedom* is complete and easy to follow. It explains what the computer is doing to turn itself into a digital voice recorder in terms virtually anyone can understand. In fact, this sophisticated program could hardly be any easier to operate. The connections to the amplifier and microphone are very straightforward, and the main menu allows for simple operation. Very shortly after you turn it on for the first time, you will be using it like an expert.

**Hacker's Pac**

*Hacker's Pac* is a software package you can purchase as a separate add-on option to *Vocal Freedom*. It is written in machine language utilizing BASIC subroutines. The subroutines themselves are stored on the disk as separate files to make it easy to merge them into your own programs; they are designed to allow the user to load, save, change speed and memory location, and play DVR files created by *Vocal Freedom*.

*Hacker's Pac* is an excellent tool for extrapolating the uses of *Vocal Freedom* and pushing the product to its utmost capabilities. With this program and its built-in subroutines, recording after recording can be loaded from disk files and stored in memory or switched in and out of memory locations.

One of the best features of *Hacker's Pac* is that it is position code independent, which means that it can be placed anywhere in the computer's memory (as long as it does not interfere with something else already in memory). This is useful when you want to tuck the module out of the way and utilize every last bit of available RAM.

Although a little intimidating at first for the novice programmer, *Hacker's Pac* comes with two demonstration programs by way of an online tutorial. It is extremely easy to use, allowing you to merge *Hacker's Pac* subroutines into programs you write. These demonstration programs really help you learn quickly how to incorporate DVR files into your own programs for spectacular voice and sound effects. If you write programs for commercial applications that utilize *Hacker's Pac*, you must contact Dr. Preble's Programs for a commercial software license agreement.

The documentation that accompanies *Hacker's Pac* is complete and accurate, although a little rigorous for the uninitiated programmer. I recommend the "grabbing the bull by the horns" approach in this case; once you begin to use (and enjoy!) *Hacker's Pac*, you will see how versatile and easy to use it is.

If you are going to purchase or have already bought *Vocal Freedom*, *Hacker's Pac* is a must if you plan to go beyond simple recording and playback

into the sophisticated areas of memory bank switching, speed setting, multiple file loads and saves, etc. As a "programmers toolkit," this software is worth every penny and will stretch *Vocal Freedom* to the maximum.

**Hear Ye, Hear Ye!**

With *Vocal Freedom* you get an amazingly powerful package with few trouble spots. None of the problems I encountered were either substantial or show-stoppers — with one exception: The documentation does not specify filename format when the machine prompts you for loading or saving files.

The version I used worked when the filename was typed without quotes and without its .DVR extension, in most cases. However, unless I answered with a correct filename at this load or save prompt, the program would crash and have to be restarted. Also, there is no warning when you run out of disk space — you just get tossed back to the main screen with the fate of your file in limbo. Here also the documentation assumes that nothing will go wrong. If something *does* go wrong that you cannot handle on your own, you can call Dr. Preble's Programs for assistance. There is a 24-hour hotline.

*Vocal Freedom* and *Hacker's Pac*, while being a little expensive when you add in the cost of the amplifier and microphone, are well worth the investment. This is a real, working digital voice recording system that could have numerous applications from interactive education to entertainment to working with blind people who want to learn about computers. Its potential for special effects makes this an excellent value and an important volume in the CoCo software library.

*Vocal Freedom* is a full-featured and sophisticated program made even more powerful by its companion, *Hacker's Pac*. In spite of a few minor problems, the programs are really quite versatile and well-programmed. I can recommend this package to anyone without hesitation. If the idea of digital voice and sound recording intrigues you, *Vocal Freedom* could be the program you've been waiting for!

**(Dr. Preble's Programs, 6540 Outer Loop, Louisville, KY 40228, 502-969-1818; *Vocal Freedom*, $34.95; *Hacker's Pac*, $14.95; add $2.50 S/H)**

**— Jeffrey S. Parker**

**Software** CoCo 1, 2 & 3

# *BASIC Utility Diskette* — Utilities for the BASIC Programmer

The *BASIC Utility Diskette* from T.E.M. of California is a collection of five programs to assist the software developer in writing and debugging BASIC programs. The disk also includes a compiled version of two of the programs to increase the processing speed for large files. The utilities require a CoCo 1, 2 or 3 with at least 64K, one disk drive and a printer.

The five utilities consist of the following programs: COMPARE.BAS, CROSSREF.BAS, DUMPCRT.BAS, DUMPDIR.BAS and DUMPFILE.BAS. Patches are provided for each of the programs, so you may customize them for your particular hardware. This allows you to bypass the initial questions about which CoCo you are using and how many drives you may have.

The first utility, COMPARE.BAS, comes with a compiled version, which is loaded by a BASIC program called COMP.BAS. Both perform a line-by-line comparison of two BASIC programs, which may be saved in either ASCII or binary format as long as both files are in the same format. The lines that differ will be output to the printer (you can elect to have the entire line printed or just the line numbers).

The compiled version requires that you leave the disk in the drive, because it loads program code as required. Single-drive users are required to copy the utility programs onto the same disk as the programs being compared. This utility makes it very simple to locate minor changes between program versions. The manual includes instructions for handling versions with line numbering offset by the RENUM command.

The CROSSREF.BAS utility can be used only on BASIC programs saved in binary format. This utility provides a numerical listing of all jump instructions (i.e., GOTO, GOSUB, etc.) in a program. It requires the use of temporary storage space on your disk; therefore, there must be space available and no write-protect tab. The space is released upon normal completion of the program. Halting the program during execution will not release the disk space used: You must run the program again and allow it to complete normally to release the space. The output produced is a listing of line numbers called and from where they are called.

The DUMPCRT.BAS utility includes three versions. One is for standard 32-by-16 text displays, one is for 40-by-24, and the other is for 80-by-24. Of course, the last two are only for the CoCo 3. According to the instructions, the primary use of this program would be to print the screen display of the TRON (trace on) command. DUMPCRT may be executed directly from the keyboard or embedded within the program being traced using the TROFF (trace off) and RUN commands. Small sections of code may be traced and debugged in this manner. You must select the proper locations to embed the DUMPCRT command so your trace will not scroll off the screen before being printed.

The DUMPDIR.BAS program is mainly to assist in keeping track of the programs on your disks. It produces a printed listing of the files on a disk that may be trimmed to fit into a disk jacket for reference. The information includes a disk name and date, filename, extension, type, indication of binary or ASCII format, number of granules, number of sectors, and amount of free space remaining — a very handy program, indeed.

The last utility is DUMPFILE.BAS. This utility may be used with programs written in BASIC and saved in either ASCII or binary format, as well as with machine language programs. A printed copy of the disk file is produced in either decimal or hexadecimal form. The number of sectors in the file is determined, and you may dump any range of sectors. The listing contains 20 bytes per line and 256 bytes per sector.

Two of the demo programs provided on the disk are also useful utilities. One produces a sorted directory listing on the screen, and the other converts either a decimal or a hexadecimal number to binary.

All of the programs worked flawlessly and were accompanied by a 32-page manual. I tested several different BASIC programs and one machine language program as well as the demos provided. The CROSSREF program even found a syntax error (an extra quote mark) in something I had typed. Programmers who do much work in BASIC

would do well to include the *BASIC Utility Diskette* in their utility library.

**(T.E.M. of California, Box 4311, Fullerton, CA 92634, 714-871-8210; $19.95 plus $2 S/H)**

**— Larry Birkenfeld**

**Software** CoCo 3

# *Castle of Tharoggad* — To Slay an Evil Wizard

The good wizard who ruled the kingdom of Tharoggad has been abducted and imprisoned by his evil brother. You, the superhero of the land, must go into the castle and rescue him. But beware: There are traps to avoid and giant spiders, snakes, ghosts and bats that you must do battle with, using weapons found along the way.

*Castle of Tharoggad* is a maze Adventure game supplied on a ROM pack for the CoCo 3. The game has seven levels, and you start out on the ground floor carrying nothing but a backpack that contains a torch. You will need a joystick or mouse and either a TV or RGB monitor. The package includes an 11-page booklet that provides adequate instruction on game play.

*Castle of Tharoggad* is icon- and menu-driven. The lower half of the game screen consists of the icons, which represent your options. In the center of the collection of icons is a beating heart — yours. The speed with which the heart beats is determined by how much you exert yourself moving around and battling creatures. The slower the heart beats, the healthier you are and the more likely you will defeat the creatures. On the other hand, the faster it beats the more likely you will lose the battle.

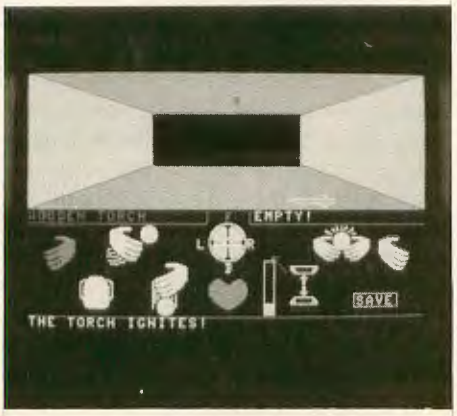
Just above the heart is a compass you point and click to move around the maze. There is also a game save icon — this feature is a must! The game save consists of four codes of nine letters and numbers. Other icons include left and right hands, a backpack in which to store inventory, "grab" and "drop" icons, an "incant" icon, and "trap door" icons to reach the levels above and below.

To pick up an object, you point to either the left or right hand and then to "grab." To pull something out of the backpack, you point to the backpack and then to a hand. To attack one of the verminous creatures that never leave you alone, you double-click on either the left or right hand icon. Castle inhabitants will also pick up objects — sometimes objects that you'll need later in the game. However, when you kill a creature it drops whatever it's carrying.

The graphics occupy the upper half of the screen — the maze with the creatures, weapons and traps. You'll see all this, that is, after you figure out how to make your torch work. The graphics, though animated, are not what you would expect from a CoCo 3 game. In fact, I have seen better graphics on CoCo 2 games. It's hard to feel heroic when you're slaying a blue spider that wears a silly grin on its face.

Also, the joystick response sometimes becomes very sluggish during battle, which can be frustrating. To be honest, the whole game is a little slow.

Until you collect a certain number of objects, which involves killing a number of creatures, you cannot find the doorway to the next level. At times the creatures would attack in twos or threes, regardless of whether I stayed still or moved around. Other times I could find no creatures, weapons or door to the next level for long periods of time.




I feel that if *Castle of Tharoggad* had better graphics and more action it would be more appealing. But if you're a video Adventurer who is persistent and does not mind if a game is a tad slow, *Castle of Tharoggad* could be a game for you.

**(Tandy Corporation, Fort Worth, TX; $29.95: Available in Radio Shack stores nationwide)**

**— Steve Griffith**

**Software** 512K & OS-9 Level II

# *OS-9 Level II BBS* — Put Your Own Board Online

One of the most entertaining aspects of the computer hobby is telecommunications. Many of us use our CoCos to communicate with Delphi and CompuServe as well as with friends both near and far. As you sit at the keyboard browsing through the myriad of databases on these systems, you might think it would be neat to operate such a system yourself, admittedly on a much-reduced scale.

There are programs in the Disk BASIC world that let you start and operate a BBS. *CoBBS* (THE RAINBOW, November 1985, Page 135) is one of them. Now those of us in the OS-9 realm have the same opportunities with the introduction of *OS-9 Level II BBS*.

*OS-9 Level II BBS* is not a single, large bulletin board program — in the spirit of OS-9, it is a set of utilities and commands used to create and run the board. In addition to the software, you will need an auto-answer modem and 512K of memory.

Rather than discuss all the components, I think the following will best illustrate the package:

| Command | Function |
|---|---|
| tsmon | autobaud terminal monitor |
| login | user log-in manager |
| monitor | carrier-detect monitor |
| menu | menu manager |
| BBS.build | simple file creator |
| BBS.chat | chat with SysOp |
| Answer | answers request to talk with SysOp |
| BBS.create | creates message base |
| BBS.post | posts a message to the board |
| BBS.delete | deletes a message |
| BBS.pack | packs messages after deletion (conserves disk space) |
| BBS.read | reads messages |
| BBS.forward | reads forward beginning with a specified message number |

| | |
|---|---|
| BBS.new | reads all new messages since last access |
| BBS.scan | lists headers of all messages in the message base |
| BBS.search | keyword search of message |
| BBS.mail.post | posts mail |
| BBS.mail.check | checks to see if previously sent mail has been received |
| BBS.mail.read | reads mail |
| BBS.mail.readd | deletes mail |
| BBS.upload | provides capability to upload files to the BBS using either standard Xmodem, CRC Xmodem and Ymodem |
| BBS.download | provides the same transfer options to download files |
| BBS.conf | enters conference with another user |
| BBS.conf.who | informs user who is on the system |

As you can see, all the basics of a bulletin board are present, including the standard functions for operating the usual message databases as well as three protocols for uploading and downloading files and programs. Not mentioned in this list are SysOp utilities and utilities for maintaining the download section of the board. The program provides a command that allows the SysOp to validate uploads and add a one-line description, a list of keywords and a paragraph description. This information is available to users wishing to download a file.

The *OS-9 Level II BBS* package also comes with the utilities TSMon, Login, Monitor and a menu program. TSMon is the time-share monitor, which is similar to TSMon provided by Tandy in its Development Package. This is an autobaud version in that it adjusts to the standard baud rates between 300 and 2400. Once TSMon opens communication, it runs Login and Monitor. Monitor simply monitors the carrier detect signal from the modem. When this signal is lost, Monitor kills all processes started by the user so that a new user can log in. Login provides just what you would expect — it requests the user's ID and password and then validates the user and runs the menu program. This is the standard and usual way of running the board; however, the SysOp can choose to give a particular user access to the shell.

***"Installing the bulletin board is quite easy since an installation shell script comes with the package."***

The menu program is quite useful in its own right, providing a way to add new options to the BBS. Two files are read by the menu command. The first file is the menu itself. The second file is the command file, which is a list of single-letter options and the command


★ ★ ★ NEW ★ ★ ★

**BASH** by Steve Bjork
Based on a popular arcade game which we can't mention (But sounds like "Art Gannoyed"). BASH challenges you to clear the screen by "BASHING" your ball through multiple brick layers. Of course you'll have help getting through this 20 level game by activating options like, Slow Ball, Expanded Paddle, Multi-Ball and more!
Reg $29.95 Introductory Special $24.95
Color Computer 3 only

★ ★ ★ NEW ★ ★ ★

**WARP FIGHTER 3-D** by Steve Bjork
Blast into Hyper-Drive with this fun-filled starship shoot-em-up! You'll have a captain's eye view out of your 3-D cockpit as you try to rid the galaxy of the evil enemy forces. Game includes 3-D glasses and works on any Color T. V., Composite or RGB monitor.
Reg $29.95 Introductory Special $24.95 EXTRA GLASSES $2.95
Color Computer 3 only

★ ★ ★ NEW ★ ★ ★

**MINE RESCUE** by Steve Bjork
A terrible mine disaster has just occurred and it will be up to you and your talents to enter the mine, jump the pits, avoid the spikes, fight off the bats and other creepy crawlers and get air to the needy victims. Mine rescue features over 2 megabytes of arcade-style graphics, real time music and multiple mine levels. Hours of fun!
Reg $29.95 Introductory Special $24.95
Color Computer 3 only

★ ★ ★ NEW ★ ★ ★

**SAMPLE DISK**
Tired of getting burned on games you haven't seen? Try our sample disk. We'll ship the above three games on a demo disk for you to see for yourself how good they are. If you decide to purchase the full versions, we will deduct the sample disk price from your order (3-D Glasses Not Included).
Demo Disk $4.95

**SUPER SPECIAL GET ALL THREE GAMES FOR $60.00!**

**ATTENTION PROGRAMMERS** – Game Point Software is looking for talented writers. Top royalties guaranteed.

**GAME POINT SOFTWARE**
**Send Check or Money Order to:** P.O. BOX 6906, BURBANK, CA 91510-6907
**Add $3.00 S/H** (818) 566-3571

to be executed for that option. The following should illustrate how Menu operates.

| Menu File | Command File |
|---|---|
| L List files | L Dirdownloads |
| U Upload file | U Uloadx |
| D Download file | D Dloadx |
| M Main menu | M Chd /dd/BBS |

All OS-9 commands and special characters are valid on the command lines of the file. The neat thing about the Menu command is that a change directory command will cause Menu to read the menu and command files in the new directory. This is accomplished by using the same filenames for these files in each directory, e.g., bbs.menu and bbs.cmds. These files are text files and can be created by your favorite editor.

Installing the bulletin board is quite easy since an installation shell script comes with the package; this consists of two disks that contain the various programs and a complete BBS ready to run. In other words, all of the menu and command files have been set up. Install creates all the necessary directories and copies the menus and files. This is very useful for those with hard disks or floppy drives other than the standard single-sided 35-track drive, which the software comes on.

A very nice feature of *OS-9 Level II BBS* is an option in the TSMon command that allows you to run the BBS in a window for debugging. It's really neat to have the board running in Window 1, *DynaStar* in Window 2 and utilities in Window 3 as you begin the process of customizing the board. In this way you can make changes and see the immediate result by flipping to the BBS window.

Although the primary purpose of the *OS-9 Level II BBS* is to run a bulletin board system, there are several other uses for the software. As I noted above, the board will run in a window — it could be set up as a family message center.

If you transfer public domain programs with others, you can eliminate the need for two people to have to set up terminal programs. Rather, set up the BBS — at least one person is free to go on and do other things with the CoCo. As you would expect for a multitasking system, you can perform other tasks while the BBS is running — even on a floppy system. *OS-9 Level II BBS* was tested on a floppy disk-based system and performed just fine. Obviously, a hard disk will greatly improve system performance.

The Menu program, which actually controls the BBS, is a very useful program in other ways. It can be used (especially on a hard disk) to better manage the use of the computer, i.e., make OS-9 more user-friendly by setting up menus and command files in each directory and letting Menu control the movement about the system.

Although I don't have the time to run and maintain a BBS, *OS-9 Level II BBS* is an excellent package for those who do. It is nicely done, especially with the operational BBS included. The ability to customize the BBS to your own liking is an added feature. And the additional use of some of the utilities beyond the BBS make this package especially attractive.

One precaution independent of the software is to make sure that the cable between computer and modem carries the DTR and carrier-detect lines. These lines are necessary and are sometimes not connected in some cables (I learned about this the hard way!).

**(Alpha Software Technologies, 2810 Buffon St., Chalmette, LA 70043, 504-279-1653; $19.95.)**

**— Donald Dollberg**

Book

# *DELPHI: The Official Guide* — Off-Line Help for Online Operations

Like the intrepid native guides that lead expeditions up the Amazon, *DELPHI: The Official Guide* will lead you through the vast jungle of information offered on the Delphi computer information network. If you, like me, find the service easy to use, but the quantity of information offered bewildering, then this book is for you.

Even though Delphi has a very complete online help library, the ultimate help utility is this book. Written with the new user in mind, *The Guide* will be of benefit to most Delphi subscribers — especially when trying something for the first time.

> ***"The reader is guided through virtually every menu the service offers and is provided detailed explanations of what each choice from every menu will yield."***

The book begins with a section called "Getting Started." In simple language, using a minimum of jargon, the section gives you instructions on how to set up your terminal software to communicate with Delphi, how to sign up on Delphi, and how to tell either Tymnet, Telenet or Datapac that you want to be connected to Delphi. From there you go into a discussion of important commands and how to answer questions in a way that the service understands.

The next few chapters are filled with descriptions of services and options available. Did you know that Delphi has a mortgage calculator online? That's just one of the services you can find out about in the book. I doubt most users would ever discover all the neat things on Delphi by themselves. With *The Guide*, it's all laid out in black-and-white for you to study off-line.

The reader is guided through virtually every menu the service offers and is provided detailed explanations of what each choice from every menu will yield. This alone justifies the price of the book. I have spent a great deal of time online searching through the various menus, looking for a particular service I'd seen somewhere but was unable to find again. Now I just look it up in *The Guide*'s index, and there I am — without having to press CTRL-Z even once.

The chapter covering online Workspace proved to be the most helpful to me. Workspace is a versatile feature with a very cryptic way of operating (at least to me). After reading *The Guide* I still find the Workspace to be cryptic, but now I can get around in it and do some tricks I had not even suspected were possible. *The Guide* gives concise instructions and clear examples on how to do most anything you can think of with the files in your Workspace.

*The Guide* contains more than 480 pages with almost 100 pages of references, indexes and appendices. There is also a three-page, front-and-back pull-out that lists all the commands and menu options.

*DELPHI: The Official Guide* seems to be as complete a reference as you will ever need. If you use Delphi often, *The Guide* will eventually pay for itself — you'll save on the connect fee usually spent reading through help screens. You can look up any information you need — off-line. Besides, reading *DELPHI: The Official Guide* will give you something to do while waiting for the evening hours when you can afford to get online.

**(Simon & Schuster, 1 Gulf+Western Plaza, New York, NY 10023, 212-373-8142; $21.95)**

**— David Horrar**

Color Super Gemprint

Print your Graphics Screens in Color on your NX-1000 Rainbow

Color Screen Dump Software

Use your favorite program to create a pmode or hi-res graphic image, but don't stop there! Run our color graphics software and print a color image using a pallette of 81+ colors on your NX-1000 Rainbow from a CoCo 1, 2, or 3. This system superimposes 4 graphic screen dumps (black, blue, yellow & red). The colors mix and add to give you your own color masterpiece.

System Requirements: 32k ECB Disk, Blue Streak 1 , 2, 3 or Ultima

$19.95

FREE with purchase of NX-1000 Rainbow Printer

Price, specifications subject to change without notice.

DAYTON ASSOCIATES of W.R. HALL, INC.
9644 QUAILWOOD TRAIL
SPRING VALLEY, OHIO 45370
OHIO RESIDENTS ADD 6% SALES TAX • C.O.D. ADD $2.00

PERSONAL SERVICE
(513) 885-5999
Visa & MasterCard
within the continental U.S.

# *Video Draw Poker* — Five-Card Simulation

According to its author, *Video Draw Poker* was developed to simulate the video poker machines found in casinos. (Depending on where you live, they may also be found in local clubs and bars.)

Usually for a minimum of a quarter, the machine deals you five cards. After the deal you may replace some or all of the cards. If your new poker hand then meets the requirements for one of the payoffs, you are either paid off or credited with additional plays.

Unlike real slot machines, winning and losing is not totally a random event — your choice of which cards you keep and which you discard does affect your likelihood of winning. (Unfortunately, however, even if you make the best possible move, the odds, like the odds on slot machines, are still stacked against you.)

*Video Draw Poker* works on two levels — you can play the game for nothing and, perhaps more importantly, you can test various playing strategies.

The simulation comes on tape or disk and requires a minimum of 32K. I tested the disk version. From a simple menu, your choices are playing, testing or quitting. If you choose to play, you will be asked how much money you want to start with. Once you are staked, you can bet from $1 to $5 on a hand as long as you have money.

Once you have made your bet, five cards are dealt. (The graphics are relatively simple — the purpose of this simple program is not to dazzle your friends.) You then choose your discards and the computer replaces them. If your hand meets a payoff level, your winnings are added to your stake. Play continues until you either run out of money, quit or decide to test a playing strategy.

I found the strategy-testing part of this simulation to be its most interesting and valuable feature. The program allows you to set up a hand — you decide which five cards you initially receive, which you will discard, what your initial stake is and how much each hand is worth.

When the simulation is set up, the computer will then randomly play this same hand as many times as you want it to — all the while keeping a running total of your stake. For example, suppose that you are dealt a four, five, seven, eight (each of different suits) and an ace of diamonds. Do you throw away the ace and hope to draw a six (completing your "inside straight") or do you discard everything but the ace, figuring that drawing four cards will give you more possible ways of winning?

***"What should I do if three of the cards, including the ace, are diamonds? If four of them are diamonds? With this simulation, I can find the best strategy."***

Figuring the odds of drawing the straight are fairly easy — there are four sixes in the remaining 47 cards. Therefore, I have four chances in 47 of drawing a straight that will give me back $4 for my dollar wagered. (Note that a six is the only card that will win for me.)

The second possibility is not as easy to figure. With four cards, I could match my ace, pair other cards, get a straight, flush, full house, or even a royal flush. The possibilities are measurable but not nearly as easy to figure.

Which is the better play? I could consult my old statistics textbook or I could allow the computer to play each hand perhaps 5,000 times. The answer would most likely be the same. The beauty of this simulation is that it allows us to check various strategies. What should I do if three of the cards, including the ace, are diamonds? If four of them are diamonds? With this simulation, I can find the best strategy.

In his easy-to-understand documentation, the author lists four uses for his program: fun, testing strategies, practice, and deciding "if you want to do real gambling on this type of machine." Interestingly, the conclusion for the final use comes after you've done the other three. The program is fun, and it allows you to practice all kinds of strategies. But it still wins even when you use the best of strategies. If you are interested in video poker, you should check into this program.

**(Prometheus Software, P.O. Box 15859, Long Beach, CA 90815; $17)**

**— John Matviko**



# *V-Term* — CoCo 3 Terminal Emulation

Whether you are going online for the first time or just looking for a terminal program that is a little more versatile than the one you are presently using, I don't think your search will be over until you have purchased a copy of *V-Term*. This is probably one of the most versatile and full-featured terminal emulators I have seen for the CoCo 3.

One of the first things I noticed upon opening the package was the well-written and professional-looking manual, which contains 56 pages of information that will have you online in no time. It even includes a section called "An Introduction to Data Communications," which should help even the novice to understand exactly how modems and terminal programs work together to allow communication with other systems.

I feel I should mention the quality of the manual because, in my opinion, even the best program is worthless if it is not supported by the proper documentation. Believe me, *V-Term*'s manual leaves few questions unanswered.

Another thing I am happy to report is that *V-Term* is supplied on an unprotected disk, so you can make a backup.

When I loaded *V-Term*, it auto-executed and I was greeted with the start-up screen. It was a 28-line screen of which the bottom three lines were reserved for the onscreen menu. Using the ALT and arrow keys I was able to select from the menu options, which usually presented me with a submenu.

The first choice I made was to select the option Parameter from the main menu. From here I was able to change the RS-232 rate, the transfer protocol I wanted for uploading/downloading files, printer settings, and even screen color. I was able to save these and other options to disk — every time I boot *V-Term* it's configured exactly the way I like it. Still not impressed?

Another option from the Parameter menu is Terminal, which allows you to choose from the four types of terminals *V-Term* can emulate: VT-100, VT-52, Vidtex and CRT. If you subscribe to CompuServe, something you may find of special interest is that *V-Term*'s

*If you are working on a BASIC program that has you stumped, write in to Bill for a fix. He can help solve your programming problems.*

### Merging Subroutines

*Dear Bill:*

*I've been computing for only about seven months, and this month I finally upgraded to a disk system. I've written several programs that use the same subroutine. Up until now when I wanted to start a new program, I deleted all the lines from the previous program except those of the subroutine I want to re-use. What do I do, short of re-entering those lines, if I've already started a program and decide I'd like my old subroutine added? Any help you can offer will be greatly appreciated.*

*Todd Barkley*
*Orange, CT*

That particular question was one I asked a few years ago myself. I've since gotten some extended use out of the procedure I'm about to explain. It's called MERGE, and it is really quite handy.

There are only a few things you have to remember when using the MERGE command. First, the program or portion of a program you'd like to add to the main program must first be saved in ASCII format. To do this, simply isolate your routine, deleting all line numbers you won't be using. What's left we'll call SUBX (SUBroutine X). We'll call the main program MAIN; it will be numbered starting with Line 10 and continuing through Line 300.

Personally, I like to renumber my subroutines before I save and merge them, but you don't have to. However, just humor me for now and do it this way. Later on, when you become familiar with the procedure, you can take all sorts of liberties.

All right, so now you have SUBX and nothing else in memory. Type RENUM 1000,10,10 and press ENTER. To see the results, type LIST. You'll notice that SUBX now starts at Line 1000 and continues listing in increments of 10. You can renumber starting with any number you like, as long as it's higher than the last line number of the program to which you want to merge it — at least for this example. Now that you have your renumbered SUBX in memory, save it in ASCII by typing SAVE "SUBX",A and pressing ENTER. Now if you type DIR and press ENTER, you'll see that your subroutine is saved on disk. Make sure that this ASCII-saved subroutine and the main program are both on the same disk.

Once both of these files are on the disk, type LOAD"MAIN" and press ENTER. At this point MAIN is now in memory and SUBX is only on the disk. Once you've loaded MAIN, type MERGE "SUBX" and press ENTER once again. You'll hear the disk drive churning. When it stops and the OK prompt appears, your two files will be merged into one. To make sure, type LIST, press ENTER and you'll see the program scroll by. You can halt the scrolling any time by pressing SHIFT and @ simultaneously.

You'll notice, as MAIN scrolls by, that when it gets to Line 300, the next line is 1000. This is where SUBX picks up. Now you're free to continue adding more lines to the main program between lines 300 and 1000. When you need to access your subroutine, add a line that says GOSUB 1000.

Now the two merged files are in memory, but you'll have to re-save them to disk again. Call the product of the merger MERGPROG, for example, type SAVE"MERGPROG" and press ENTER. That's about all there is to it. It'll save you a lot of extra typing and time.

**By Bill Bernico**
**Rainbow Contributing Editor**

*Bill Bernico, RAINBOW's newest columnist, is the author of more than 300 Color Computer programs. He founded Bill Bernico Software in 1987 and enjoys writing and recording his own music.*

### DATA Dilemma

*Dear Bill:*

*How does one understand and write* DATA *statements as part of a BASIC, pseudo machine language, program? I can understand the basic concept of a line like*

```
READ A:FOR I=&Hxxxx to &Hxxxx
:POKE I,A:NEXT I
```

*but from there on, my comprehension fails me. What are the numbers in the* DATA *statements? What do they stand for, and most of all, how do we (the programmers) know where to get them and how to put them in the proper order?*

*I would really appreciate being enlightened because some programs are written entirely in* DATA *statements. Thanks for your help.*

*Bernice Shoobs*
*Clifton, NJ*

It's funny that you'd ask me this question, Bernice. I wondered about it myself for a long time and finally asked someone more familiar with the procedure than myself about it.

I learned that the program is first written in assembly language using an editor/assembler. When the process is complete, you have a *binary* file. Since, on a scale of one to 100, my knowledge of ML programming is about .00001, I can't help you with the procedure of assembling the code.

However, from what I understand, once you have that binary file, you can convert it to BASIC by using a short program that changes the binary code to DATA statements. Kevin Davidson's utility, *MacData*, [RAINBOW, "The Demystification of ML On Disk," December '83, Page 181] would accomplish this task. I've tried the program and have converted several binary files to BASIC programs. These programs go a little slowly, but they work fine.

### From Text to Graphics

*Dear Bill:*

*I'd like to convert some of my favorite BASIC text programs to the graphics screen. Without doing a lot of guessing, is there a way to figure out where to draw so that the text will appear in about the same position on the graphics*

# Received and Certified

RAINBOW CERTIFICATION SEAL

*The following products have recently been received by THE RAINBOW, examined by our magazine staff and issued the* Rainbow Seal of Certification, *your assurance that we have seen the product and have ascertained that it is what it purports to be.*

**The Answer**, a program that allows you to communicate with your "inner self" via subliminal messages. For the CoCo 3. *Alpha-Biotechnologies, Inc., P.O. Box 2203, Richmond, IN 47375, (317) 962-6644; $29.95.*

**Armchair Admiral**, a Battleship-type game for up to eight players that places you at the helm of four ships — a sloop, caravel, brigantine and galleon. "Your orders are to stay afloat while trying to sink your enemy, who is in command of identical ships." For the CoCo 3. *Eversoft, P.O. Box 3354, Arlington, WA 98223, (206) 653-5263; $14.95 plus $2 S/H.*

**Bash!**, a one- or two-player machine language arcade game, similar to *Breakout*, that has players ping-ponging and blasting away "bricks" (the scenario involves construction). There are 20 screens of debris that must be cleared away. If you catch the special falling bricks, you will be rewarded with points. For the CoCo 3 and disk drive. Program written by SRB Software but available exclusively through Game Point Software. *Game Point Software, P.O. Box 6907, Burbank, CA 91510, (818) 566-3571; $24.95 plus $3 S/H introductory offer, regularly $29.95 plus $3 S/H (demo disk, $4.95).*

**Deluxe Icon Editor**, an AIF icon editor running under OS-9 Level II in the *Multi-Vue* environment on 512K CoCo 3s. Documentation is included on the disk. A mouse and a high resolution interface are recommended, but not required. Requires 512K CoCo 3, OS-9 Level II and *Multi-Vue*. *Puritas Springs Software, Ameritrust Building, 17140 Lorain Ave., Cleveland, OH 44111, (216) 251-8085; $10.95.*

**Horse Sense**, a horse race handicapping program that breaks the race down into three sections — call, second call and wire. The speed of the horse is computed in feet/second for each of these sections. For the CoCo 1, 2 and 3. *Western Hills Software, 6133 Glenway Ave., Cincinnati, OH 45211, (513) 662-3233; $24.95.*

**The KJV on Disk: Mark**, the Bible's book of Mark on disk in ASCII files for importation into a CoCo 1, 2 or 3 word processor. *BDS Software, P.O. Box 485, Glenview, IL 60025, (312) 998-1656; $3.*

**MacPlay**, a program that allows you to play Macintosh digitized sound files, which can be downloaded from CompuServe or Delphi. For the CoCo 3. *CoCoTech, Inc., 208 Cathy Ann Drive, Reading, PA 19606, (215) 779-7768; $19.95.*

**Mine Rescue**, an action ML game for one or two players. Your mission is to rescue trapped miners whose air is rapidly running out. You can pick up extra points on the way by gathering gold and gems while avoiding falling icicles and the banshee. Carrying tanks of fresh air, you will climb rocks and ladders and leap pitfalls. The game was written by SRB Software but is available solely through Game Point. Requires CoCo 3, disk drive, joystick and color/RGB monitor. *Game Point Software, P.O. Box 6907, Burbank, CA 91510, (818) 566-3571; $24.95 plus $3 S/H introductory offer, regularly $29.95 plus $3 S/H (demo disk, $4.95).*

**R.S.B.**, an adaptation of Disk Extended Color BASIC for OS-9 Level II. The command syntax is identical, and BASIC programs may be run in several windows simultaneously. Commands are accepted in both upper- and lowercase, and all I/O uses OS-9 system calls. For the CoCo 3 and OS-9 Level II; compatible with *Multi-Vue*. *Burke & Burke, P.O. Box 1283, Palatine, IL 60078, (312) 397-2898; $39.95.*

**Scenery Disk #7**, a scenery disk for *Flight Simulator II* that covers the eastern seaboard from Washington D.C. down to Miami. It includes the major airports, radio-nav. aids, cities, highways, rivers and lakes. A map is provided. For the CoCo 3, requires *Flight Simulator II*. *subLOGIC Corporation, Champaign, IL; available through subLOGIC's order line: (800) 637-4983; $24.95.*

**Security Projects for the TRS-80 Color Computer**, a book of hardware projects including a "vacation light," a temperature alarm, a sound-activated alarm and an intrusion alarm. *Brown's Enterprises, 119 Skyline Drive, RH, Granbury, TX 76048, (817) 573-0037; $7.50.*

**Tax Estimator**, a tax program, placed in the public domain, that helps users estimate their federal income tax liability in preparation of forms 1040, 2106 and 2441. It may be obtained for a $5 shipping and handling fee. For the CoCo 1, 2 and 3. *Try-O-Byte, 1008 Alton Circle, Florence, SC 29501, (803) 662-9500; $5.*

**TypeMate**, a menu-driven typing tutor that draws the CoCo keyboard onscreen; whenever a key is pressed, the screen's keyboard echoes it. The program instructs beginners in correct finger placement, charts a course of study, and provides typing exercises and the capability for users to create their own lessons. Requires a CoCo 1 with 32K, a CoCo 2 with 64K or a CoCo 3. Supports cassette recorders and a printer. *Tandy Corporation, 1700 One Tandy Center, Fort Worth, TX: Available in Radio Shack stores nationwide.*

**Warp Fighter 3-D**, a one-player, joystick-controlled 3-D space fighter Simulation in which you must shoot down the Akaira enemy from 25 sectors of space. To move quickly from one sector to another, your ship is equipped with the Federation's new warp drive. 3-D glasses are supplied (for $2.95). For the CoCo 3 and disk drive. Program written by SRB but available exclusively through Game Point Software. *Game Point Software, P.O. Box 6907, Burbank, CA 91510, (818) 566-3571; $24.95 plus $3 S/H introductory offer, regularly $29.95 plus $3 S/H (demo disk—without 3-D glasses—$4.95).*

**Western European Tour Scenery Disk**, a scenery disk for *Flight Simulator II* that covers southern West Germany, northern France and southern United Kingdom. It includes the major airports, cities, highways, rivers and lakes, and includes a map. For the CoCo 3 and *Flight Simulator II*. *subLOGIC Corporation, Champaign, IL; available through subLOGIC's order line: (800) 637-4983; $24.95.*

**ZoomDump**, an update to the PMODE 3 or 4 graphics screen dump for the DMP-105 and DMP-106. New features include horizontal paper positioning and the ability to print any rectangular section of the screen, along with upright or sideways images. For the CoCo 1, 2 and 3. *Codis Enterprises, 2301-C Central Drive, Suite 684, Bedford, TX 76021, (817) 283-8571; $14.*

**First product received from this company**

The *Seal of Certification* program is open to all manufacturers of products for the Tandy Color Computer, regardless of whether they advertise in THE RAINBOW.

By awarding a *Seal*, the magazine certifies the product does *exist* — that we have examined it and have a sample copy — but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW reviewers for evaluation.

**— Lauren Willoughby**

have edited at least one module. When you create a bootable disk for the first time using OS9Gen or Config, you are combining a number of modules into a program called OS9Boot. While Config is perfectly capable of creating OS9Boot, it is time-consuming at best.

*EZGen* comes into play when you want to alter, add to or delete from an existing program that consists of a set of modules. Using only the programs available with OS-9, these tasks are quite tedious. For example, when I bring my system to school with me I use a single drive instead of the two drives I use at home. I have been putting off deleting the d1 device descriptor module in the OS9Boot program for my school disk because it would take too long to generate a new OS9Boot using Config.

As a working test of *EZGen*, I removed d1 from OS9Boot in about 10 minutes, which included reading the manual. Patching the existing device descriptor for a 12-millisecond step rate was also a quick and painless job. Finally, I added the two RAM disk modules to OS9Boot. All of this was done with *EZGen* alone.

*EZGen* has several other capabilities that some people may find handy. It allows you to rename a module, patch a module using either Burke & Burke's Patch format or the Disk BASIC binary format, save a module to disk, extend a module and add a module header.

The last two abilities are quite interesting and powerful for the hard-core types like me who like to do things in unusual ways. For example, using a file transfer program I can move a machine language program from the Disk BASIC environment into OS-9. Then, using *EZGen*, I can add a module header so that the program can be loaded by OS-9. Once it's loaded, I can use one of the powerful OS-9 disassemblers on the program. Being able to extend a module easily can allow you to add a small subroutine to an existing module without having to disassemble the whole thing first. I did that once and it was very tricky. With *EZGen* it could be a snap.

There are a few things I wish *EZGen* could do, or at least could do better. First is an ability to locate modules and data blocks within programs. You must know the names of the modules you'll be working on in order to tell *EZGen* which module name to find. This problem isn't insurmountable; you can get module names with Ident before you start (or by forking a shell from within *EZGen*), but it would be easier if there were some way to call a list of module names from within *EZGen*.

Another wish is related to a problem I had with user mistakes. Any user mistake causes *EZGen* to quit and return to OS-9 unless the command is preceded by a hyphen. I have a nasty habit of pressing ENTER a couple of times when I'm working in this type of program just to be sure it's awake and operating. Every time I do this, *EZGen* quits and I have to start it again. This isn't a flaw or a bug, just a way of doing things that takes time to get used to.

Another problem I had was with disk space. Because *EZGen* has to create at least one copy of the module you are editing, you need sufficient disk space to use it. I suggest that any program with *EZGen*'s power should be used on a backup. And because of the disk space problem, I recommend placing the backup on a nearly empty disk — especially if the module you are working on is large.

I also have some problems with the manual. The style is that of standard UNIX "man" entries. This is OK for experienced users who know exactly what they want to do, but it can be intimidating to new or occasional users who aren't familiar with the terse style. The manual could also use more examples and a better explanation of what *EZGen* can be used for. With some experimentation, most OS-9 programmers who have a use for *EZGen* will be able to figure it out, so I guess the manual isn't a big handicap. I just think that it could be expanded some.

Included with *EZGen* are two other programs that work as a team or individually for very specific tasks. *TagTrack* corrupts the OS-9 file system in a controlled way that lets you determine which files reside at least in part on a particular track. Using *TagTrack* you can locate, edit or delete the OS-9 kernel, or you can find the files that need to be deleted to clear a particular track for some reason (creating a disk readable by OS-9 as well as Disk BASIC, for example).

*Zap* can undo the corruption caused by *TagTrack*. It does this by releasing the directory entry and file descriptor sector for a file without releasing the sectors in use. It can be used to make a sector or group of sectors unusable by OS-9. These things can be done using a patch program or disk editor, but they are very tedious that way. Burke & Burke has given us a way to perform several difficult tasks quickly and easily.

If you've ever done any of the jobs that *EZGen* can do, you already know how much you need this package. If you don't see a reason why anyone would want to do what I described, then maybe you should wait until you need it. Just remember to get *EZGen* before you start — it'll save you an awful lot of work.

**(Burke & Burke, P.O. Box 1283, Palatine, IL 60078, 312-397-2898; $19.95 plus $1.50 S/H)**

**— Donald McGarry**

## Corrections

**"Received and Certified" (October 1988, Page 130):** The *Hard Bodies* program was incorrectly listed as the first review product from Baron Products for review in THE RAINBOW. An earlier Baron Products program, *Track Events*, was reviewed in the February 1986 issue (Page 200).

**"Quick Fixes" (October 1988, Page 58):** An IC pin is incorrectly labelled in the schematic shown in Figure 2 (Page 62) of the article. On the right-hand side of the figure, the designation IC4 Pin 3 should be changed to IC4 Pin 5.

**For quicker reference, Corrections will be posted on Delphi as soon as they are available in the Info on Rainbow topic area of the database. Just type DATA at the CoCo SIG> prompt and INFO at the TOPIC> prompt.**

Your OS-9 programs can then be called up with a single keystroke. It can also change the data and execution directories of any OS-9 operating system.

With my 512K CoCo 3, I was capable of building the required "menu options" file quickly and easily. Building the required batch files that are to be executed in accordance with my selection was a piece of cake. Now the menus presented reflect the types of OS-9 files my hard drive contains. I press one key from the menu calling up BASIC09, and within seconds it pops up on my 80-column screen. Impressive.

I wondered how fast it would be to get a file buried within my hard drive. So I exited BASIC09, and *Hard Disk Organizer* automatically returned to my screen. It sorted through a huge pathlist that I normally type in by hand, and all I did was press one key. It operated quickly and flawlessly.

The program is compiled in C language for speed and portability. It fully supports OS-9 windows and remote terminal users. Many different terminal configurations are supported, including ANSI, ATS and Z19.

The disk is not copy-protected, so you are capable of making a backup copy for safekeeping. The documentation is well-written and takes you step-by-step through a lot of examples, so you can get your system up quickly and to your liking.

The documentation states that the software can be used successfully on a CoCo 2 in addition to a CoCo 3, with Level I and II OS-9 systems. No memory requirements are mentioned in the documentation. I found that the software operated flawlessly on my 512K CoCo 3 but would not operate on a 128K CoCo 3 because of insufficient memory.

I ran into the same memory problem when trying the CoCo 2 version on my 64K CoCo 2. It would not operate completely due to the procedure of "forking." (To fork a process means to create a process as a branch of another process — a subroutine.) It could not fork large application programs on the lower-memory machines, due to the available free memory. But, to be fair, the author does mention that he is developing a procedure to "chain" to the application program instead of fork.

Considering all that this software does, I feel it is reasonably priced and well worth the money for 512K users. You do not need to be an OS-9 expert, and in fact I feel this software will benefit those who are beginners, especially because new OS-9 users often have a hard time getting used to typing long pathlists.

**(Robert A. Hengstebeck, 408 Grandview Ave., Feasterville, PA 19047, 215-322-5455; $24.95)**

**— Brian R. Smith**

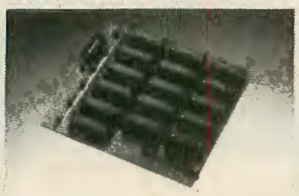
**Software** CoCo 1, 2 & 3

## *EZGen* — OS-9 Module Editor

*EZGen* from Burke & Burke is the kind of product that most OS-9 users will probably not need to use often — but when you need it, you really need it. As its name implies, *EZGen* is a module editor for the OS-9 Level I or II operating environments.

My initial reaction to the product was one of minor confusion. After all, why would anyone want to edit a module? It turns out that almost all OS-9 users


TURBO RAM BOARD



$39.95 ZERO K

$149.95 512K

- Fast 120 nsec RAM chips
- Easy-to-follow instructions
- No soldering
- Includes RAM Board Utilities

PYRAMIX Arcade Game $19.95

BACKUP LIGHTNING (disk duplicator) $14.95

RAM BOARD UTILITIES
- RAM Disk for RSDOS
- Print Spooler
- Sophisticated MEMORY TEST Program

$19.95

PAL UPGRADE $7.95 for grey or white MULTI-PACK (26-3024)

DUAL-MODE CONTROLLER

$99.95*

*ROM not included (RS DOS 1.1 ROM—$19.95). 32K SRAM—$16.95.

- 100% Compatible with existing H/W & S/W
- No MULTI-PACK required (low power draw)
- 8K Cache memory (expandable to 32K)
- Track Reads(programs load up to 2x faster)
- Two Switched Sockets (supports 8K ROM, 2764/27128/27256 EPROMs)
- Gold Contacts for reliability
- Easy Installation (no cutting, soldering, jumpers or external wires)
- Runs under OS-9 with:
  - no-halt read/write
  - interrupts and multi-tasking enabled
  - reliable clock and type-ahead

S&H: $3.50 U.S. and Canada ($15 foreign)
COD: $2.25 U.S. only
2ND Day Air: $1.50 (contiguous U.S. only)
Tax: inside California add 6%
VISA or MC accepted

30 DAY MONEY-BACK GUARANTEE PLUS FULL 1 YEAR WARRANTY ON ALL PRODUCTS!

Prices subject to change without notice

Send check or money-order to:
Performance Peripherals
11432 Pena Way
Mira Loma, CA 91752
Or Call (714) 681-3007

will destroy you and your ship. You get three misses before the game is over.

Frequently you will see the message "Press the Space Bar" displayed in the window. This is a warning that an alien vessel is about to materialize in front of your ship, and you must deploy your defense shields for protection. This is where I had trouble with the program.

As your ability to destroy the attacking meteors improves, you will move to the next level of difficulty. One such level concentrates on the "second" row of keyboard keys, or the one just above the home row. The different levels are intended to drill the user by requiring all of the keyboard keys to be depressed in various random character sequences. As levels are increased and progress is made, the user becomes a keyboard commander and earns a certificate available from the author.

Like most skills, typing requires a lot of practice. *Keyboard Commander* can provide some of the necessary practice in a manner that children will enjoy. The program provides the beginning typist with a clever, challenging way to learn the location of the various keys on the CoCo keyboard. Programs that use a "game" approach have proven to be effective learning tools. *Keyboard Commander* is such a program.

*Keyboard Commander* is supplied on a non-protected disk. The program utilizes artifact PMODE4 colors, and it looks best on a color composite monitor or a TV set. (If you use an RGB monitor with your CoCo 3, you will not be able to see the beautiful colors this program has to offer.)

**(E.Z. Friendly Software, 118 Corlies Ave., Poughkeepsie, NY 12601, 914-485-8150; $24.95 plus $1.50 S/H)**

**— Jerry Semones**

**Software** CoCo 1, 2 & 3

# *Spellbound* — Wizards, Warriors and Dungeons

Down in the lowest dungeon waits the Archwizard! Can your hardy band of Adventurers overcome monsters, avoid hazards and gain enough strength to defeat him? Can you guess his name and banish him forever? It will take many hours to find out in this Dungeons & Dragons-type text Adventure.

Visit the Adventurer's Guild to create your team, collect them at the Unicorn Tavern, then go on over to Elmo's Trading Post for equipment. Choose well, for in the vast dungeons below there are many monsters intent on destroying your team. Your characters may be human, dwarf, gnome or elf and function as paladin, fighter, thief, priest or wizard. CoCoists with a printer will be able to make a hard copy of both the roster and individual inventories. The latter come in very handy as the game progresses. I made an accordion-fold booklet that I consulted at every encounter and updated while in "camp."

***"The dungeons abound with secret passages, treasures, tricks, hazards and monsters. The deeper you go, the greater the hazards and the better the rewards."***

The game is easy to play — just press a key. In the dungeons, the screen is divided into two parts. To the right is a list of the characters and a move menu. To the left is a view of the dungeon, in perspective, as you see it looking forward two squares. Mapping is a bit tricky at first. Careful study will soon make it clear. If you really get lost, you can have your wizard use the "map" spell. You won't see a diagram, just coordinates of your location relative to the Bronze Door (entrance). I found this was adequate.

Camp is available any time there is no attack in progress. It is a place to view inventory, make changes, use spells (heal) or sleep (save). Each level of advancement adds a new spell; some protect or heal the Adventurers and others aid in defeating monsters. For proper updating of the disk, the Adventurers should retire to the Green Dragon Inn; however, camp may be more convenient at times.

The dungeons abound with secret passages, treasures, tricks, hazards and monsters. The deeper you go, the greater the hazards and the better the rewards. (Dungeon 6 is a zinger! Teleporting from Dungeon 5 to 7 would have real appeal.)

There are other places aboveground that are of interest: The Temple of Ymiro offers healing and advancement, and the library may hold some clues.

The documentation is very good. The author offers full technical support (but no clues!). Send a stamped, self-addressed envelope (SASE) for a reply to your questions. I used both CoCo 1 and CoCo 2 with no problems. The manual is very useful. The choices and spells are fully explained, so a novice can play the game as well as the more advanced.

This is a game more for Dungeons & Dragons fans than Adventure addicts. The action and the objects are average, but the dungeons (mazes) are excellent. *Spellbound* is written in BASIC, which makes for a brief delay when leaving camp. There is nothing wrong; in a short time, the screen clears and the game continues.

The biggest drawback is the lack of sound — no beeps to warn of attack or danger. The author is planning to remedy this. Some messages disappear too fast; however, the important ones wait for a key press.

There is enough room on the disk for 12 characters, which can be used six at a time. The extra characters should be developed for future use. Several backups are recommended for emergencies. It will take many hours, maybe months, to be ready for a confrontation with the Archwizard. I am neither a novice nor an expert (though I am good at mapping), and I enjoyed playing the game. *Spellbound* requires 32K, one disk drive and a CoCo 1, 2 or 3.

**(Thor Software, Suite 162, 9431 Westport Road, Louisville, KY 40241, 502-588-5969; $16.95: First product review for this company appearing in THE RAINBOW.)**

**— Audrey De Lisle**

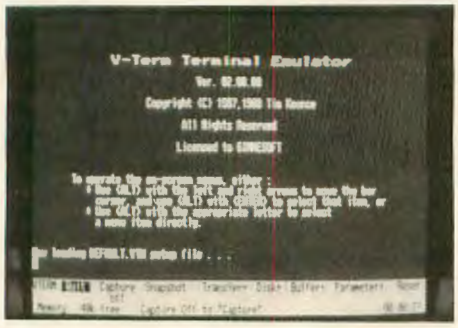
**Software** CoCo 3, OS-9

# *Hard Disk Organizer* — Type Around Long Pathlists

Don't let its name fool you — the *Hard Disk Organizer* will organize your OS-9 floppies, too.

In a hard drive system, the CMDS directory will invariably become unmanageable due to the number of executable programs found there. *Hard Disk Organizer* allows a user to develop menu-driven pathlists so that any application program can easily be accessed.

Vidtex emulation not only supports wide character display, but also medium and high resolution RLE graphics.




I was able to decide exactly how I wanted my screen to appear, including border color, background and foreground color of both the main screen and the menu display by cycling through the 64 possible colors available for each. If you spend a lot of time in front of your monitor as I do, I think you will find this very useful in finding a combination that is easy on the eyes.

Going from one BBS to another and searching for some of the excellent public domain programs that are out there is one of my favorite pastimes. If you've ever downloaded a file from a BBS I'm sure you know how annoying it can be having to stop, save the file to disk and then clear the buffer before you can either download or upload another file. *V-Term* can save you some time. *V-Term* uses a RAM disk type buffer that allows you to have several different files in the buffer at the same time.

You are limited only by the amount of buffer memory available, which in a 512K CoCo leaves about 456K available for buffer storage. A 128K CoCo would have a 72K buffer. This buffer could save you a lot of time and money if you do much in the way of long-distance file transfers. *V-Term* also gives you the option of saving your files to disk instead of memory. While I am on the subject of file transfers, I think I should point out that *V-Term* gives you the options of using either line-oriented ASCII, Xmodem, Xmodem CRC or Ymodem transfer protocols.

*V-Term* will work with just about any hardware configuration. This includes the back-panel serial port (up to 2400 baud), the DCModem pack, and even deluxe RS-232 packs that have been altered to be addressed at $FF6C to $FF6F. Not to mention 35-, 40- or even 80-track drives (providing the DOS you are using supports 40 or 80 tracks — but not *JDOS*). This should be a welcome feature to those of you using the popular *ADOS-3*.

I must admit the program lacks one feature — the ability to write to the buffer. I did not consider this to be a major problem, though, because it is possible to write to the buffer using the VT-100 mode and *V-Term*'s "snapshot" feature, which copies the current screen to the buffer. The author told me that he plans to include this option in future versions of *V-Term*. I was also told that anyone currently using Version 1.0 can upgrade to Version 2.0 for just $7 plus $3 postage and handling.

Overall, I found this program to be everything I could hope for in a terminal program and well worth the price. I would also like to add that the distributor was extremely courteous and helpful with the few questions I had and even went out of the way in helping me get in touch with the author, who was on vacation at the time. In my opinion, this kind of service is priceless.

**(Gimmesoft, P.O. Box 421, Perry Hall, MD 21128, 301-256-7558; $39.95 plus $3 S/H)**

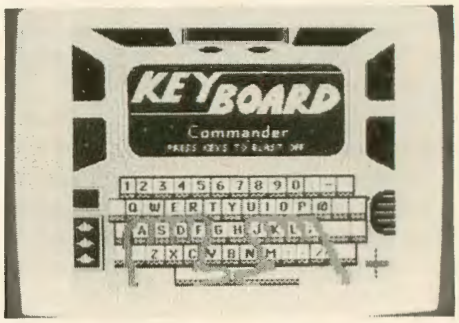
**— Bryan Gridley**

**Software** CoCo 1, 2 & 3

# *Keyboard Commander* — Learn To Type While Saving the Galaxy

*Keyboard Commander* is a typing tutor written for the 64K CoCo 1 or 2 (and CoCo 3) that teaches typing basics in a most unusual way: The student becomes a commander of a spaceship, and the keyboard keys are the controls. Interesting sound effects give the program an arcade flavor.

After the program loads and executes, you will see the inside of your spacecraft, the window and the controls (which just happen to be in the form of the CoCo keyboard). Transparent hands are shown in the "home position" and can be seen moving about the keyboard during flight.




The object of *Keyboard Commander* is to shoot down the "letter meteors" that randomly rush toward your ship. You destroy these meteors by pressing the letter on your keyboard control that represents the letter attacking your ship. If you fail to press the correct key, or if you take too long, the letter meteor


## NO MORE EXCUSES.

*Introducing*

## Start OS-9™

An Enjoyable, Hands-On Guide to OS-9 Level 2 On the Color Computer 3 By Paul K. Ward

**Ten step-by-step Tutorials teach how to:**
- Open and customize windows
- Patch your system for its highest efficiency
- Create custom boot disks
- Manage memory and disk storage

**Special Articles On:**
- Basic09, by Dale Puckett
- CoCo Hardware, by Marty Goodman
- Telecommunicating, by Bill Brady
- Hard disks and Ram disks, by Kevin Darling
- Music and OS-9, by the author

"Start OS-9" ($32.99 + s/h) is a product of Kenneth Leigh Enterprises. To reserve your copy of the book with accompanying software disk, write SMS-KLE, 2540 Potomac Hunt Lane, Suite 2A, Richmond, VA 23233 OS-9 is a trademark of Motorola and Microware Systems Corporation.

*screen as it did on the text screen? That is, if the original program had* PRINT@ 294, "TEST", *how would I know where to position the* DRAW *equivalent?*

*Allen Owens*
*Monticello, SC*

Good question, Allen. I've done a lot of what you are proposing, so I think I can help clarify it for you. At first, I did a lot of guessing. Then I stopped to think about it. To illustrate what I learned, let's use a PMODE 4 screen.

Keep in mind that on the PMODE 4 screen, you have 256 pixels across by 192 pixels down on which to position text. If you divide the 256 pixels by 32 (the number of characters across on the text screen), you get eight. This is the width of each character. Now divide 192 pixels by 16 (the number of characters down on the text screen). The characters are 12 pixels high.

There are three steps in placing text on the graphics screen. First, you must define each character and put it into A$(32) to A$(90). This will give you most characters, excluding lowercase. Second, you must define the DRAW area, and finally, you must GOSUB to the DRAW subroutine.

Suppose you want to put the message "Basically Speaking" on the text screen. Simply type the following:

```
PRINT @ 294, "BASICALLY SPEAKING"
```

You now have the message displayed on the standard 32-column screen.

On the Hi-Res graphics screen, you would type the following:

```
A$="BASICALLY SPEAKING:"DRAW
"BM48,108":GOSUBxxxx
```

(where *xxxx* is the line number at which your DRAW subroutine is located).

Why coordinates 48,108, you ask? Simple. PRINT @ Location Number 294 on the text screen is six spaces over and nine spaces down. Multiply 6 by 8 (the width of your graphics character) and you get 48. Multiply 9 by 12 (the height of each character) and you get 108.

If your message doesn't look centered, edit the message line to read PRINT @ 295 instead of 294, and the message will be centered. On the graphics screen, however, you change the first DRAW coordinate from 48 to 56, since you have to move eight more pixels to the right to equal one space on the text screen. Now your DRAW coordinates are 56,108.

The message is now centered *across*. To move closer to the center *up and down*, type PRINT @ 231 instead of 295. On the graphics screen, you will need to move up two spaces (24 pixels). To match the position on the text screen, your new DRAW coordinates should be 56,84.

Thinking logically is as essential as knowing how to program the computer. Everything *the computer does* relates to numbers in one way or another. I found out some of what I know purely by accident. The rest fell into place as I made changes and discovered that most of the changes in coordinates were divisible by 8. (Hmmmmm.)

**Questions about specific BASIC programming problems can be addressed to BASICally Speaking, THE RAINBOW, P.O. Box 385, Prospect KY 40059.**

**We reserve the right to publish only questions of general interest and to edit for brevity and clarity. We are unable to answer letters individually.**


ARK ROYAL GAMES

**ARK ROYAL GAMES** is drastically cutting prices and reducing our inventory on most of our CoCo products. Prices have been slashed on even our new programs. Send a SASE for complete price listing or $1.00 for catalog (refunded with first order).

Better hurry. When item is depleted it will not be restocked.

**EXAMPLES**

| | |
|---|---|
| ACES (64K Disk) WWI Flight/Combat simulator | $15 |
| DOUGHBOY (64K Disk) WWI Real Time Combat | $14 |
| COMPANY COMMANDER (32K) Tactical War Game | $15 |
| ALL MODULES FOR COMPANY COMMANDER | $10 |
| COMPANY COMMANDER SCENARIO CREATOR (32K) | $12 |
| OKINAWA (64K Disk) WWI Marine Invasion | $12 |
| LUFTFLOTTE (32K) Battle of Britain | $14 |
| FIRE ONE! (CoCo 3 Disk) Sub Warfare in WWII | $15 |
| PRO FOOTBALL (CoCo 3) 1 or 2 players | $12 |
| BATAAN (64K Disk] Two games in one | $10 |
| TUNIS (32K) Battle in North Africa | $ 8 |
| GUADALCANAL (32K) America Strikes Back | $ 7 |
| BOMBER COMMAND (32K) | $ 6 |

And more! Almost all prices have been cut. Call or write for price list.

**ARK ROYAL GAMES**
**Post Office Box 14806 • Jacksonville, FL 32238**
**(904) 221-5712**

Include 50 cents per program shipping and handling.
Florida residents add 6% sales tax.

**NEW, LOW PRICES!**
**SAVE 40% TO 33%**
MONEY-BACK GUARANTEE!
COMPATIBLE WITH COCO 3!

SCREENPRINTS ON ANY PRINTER!!

*Picture Perfect*

GRAPHIC SCREENPRINT PROGRAM
FULL-PAGE PRINTOUTS WITH-

RADIO SHACK: LPVII, LPVIII, DMP100, DMP105, DMP106, DMP110 DMP120, DMP130, DMP130A, DMP200, DMP430, CGP220.

EPSON/IBM: ALL COMPATIBLE PRINTERS - MX/RX/FX/EX/LX/LQ SERIES, STAR GEMINI 10X/15X, NX10/15, NX1000.

AND: ZENITH MPI99, NORTH ATLANTIC GANTEX, BROTHER DM-40, CANON INK-JET, PANASONIC, C-ITOH AND LEADING EDGE PROWRITER, OLIVETTI INK-JET, TOSHIBA, OKIDATA, GORILLA BANANA, AND MORE!!

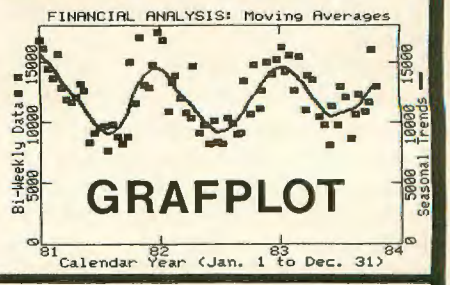
ONLY $15.00(US) ON DISK OR TAPE

TURN DATA INTO ARTWORK WITH-

LOADS SPREADSHEETS
AUTO SCALES & LABELS
SMOOTHS & INTEGRATES
291 GRAPHING SYMBOLS
UNLIMITED OVERLAYS
STORE COMPLETE GRAPHS
MANUAL & TUTORIAL

SPECIFY PRINTER WITH YOUR ORDER!

TAPE: $25.00 (US)
DISK: $30.00 (US)




GRAFPLOT

SEND CHECK OR MONEY ORDER TO:
HAWKES RESEARCH SERVICES: 859 STANFORD AVE, OAKLAND, CA 94608
FOR INFORMATION - (415) 547-7557. SHIPMENT WITHIN 48 HOURS!
ADD $3.00 SHIPPING ON ALL ORDERS. CA. RESIDENTS ADD SALES TAX

**Speaking of DRAM Prices . . .**

*In this time of high DRAM prices (which has forced most RAINBOW advertisers to either charge up to $200 for an upgrade or supply no chips with 512K boards), I am pleased to report that I recently bought Tandy's 512K CoCo 3 upgrade for under $140.*

*Marlin Lee Simmons*
*(LINLEE)*
*Bridgewater, VA*

The DRAM-chip price situation is unfortunate. Dealers and end users alike have been hurt by the part's price increase. I believe Tandy was able to order a large quantity of these chips at a "locked-in" price. However, soon (perhaps before readers see this printed) Tandy will be forced to raise its prices, too. The increases in the prices charged by RAINBOW advertisers for 512K CoCo 3 memory upgrades reflects the extreme increase in cost for the chips. Note, too, that the price of these chips varies from week to week (sometimes from day to day), so it is often impossible for dealers to post a price in the magazine, which is distributed a month or more after their ads are submitted.

**Increased Volume**

*When I hook a speaker to the audio output on my CoCo 3, the volume is very low. How can I use an amplifier with it?*

*Matt Hazard*
*Columbia Station, OH*

Feed the signal coming out of the audio output jack on the CoCo 3 into the auxiliary input on any high fidelity amplifier. Use that to drive a speaker. You could also hook the audio output of the CoCo 3 to the audio input of a Radio Shack speaker-amplifier (Cat. No. 277-1008) using Radio Shack cable 42-2444.

---

*Martin H. Goodman, M.D., a physician trained in anesthesiology, is a longtime electronics tinkerer and outspoken commentator — sort of the Howard Cosell of the CoCo world. On Delphi, Marty is the SIGop of RAINBOW's CoCo SIG and database manager of OS-9 Online. His non-computer passions include running, mountaineering and outdoor photography. Marty lives in San Pablo, California.*

**By Marty Goodman**
**Rainbow Contributing Editor**

**Memory Upgrades and a 3½-inch Drive 1**

*I'm considering increasing my CoCo 3's memory to 512K and getting one of the new word processors specifically designed for the CoCo 3. However, the buffer of some of those programs exceeds the storage capacity of my 5½-inch drives. Will a 3½-inch drive work as Drive 1? How would I hook one up? I have a standard Radio Shack controller and a FD 502 as Drive 0.*

*Paul R. Broshear*
*(GROUCHY)*
*Saddle Ridge Trail, TX*

Your major concern is how to best use one of the current generation CoCo 3 word processors, and 512K is not needed for such CoCo 3 word processors as *Telewriter 80*, *Word Power 3.1*, *Telewriter 128*, or *VIP Writer III*. The jump from 128K to 512K really does not add much in terms of actual function. At the current DRAM prices of $12 a chip, the 512K upgrade is hideously expensive.

512K *is* essential if you want to run programs under OS-9 Level II. But for most Disk BASIC word processor programs, 128K should be all you ever really need. As you noted, Disk BASIC is not set up to save files bigger than 153K of data (the capacity of a single-sided disk) even with double-sided drives. You can go to 3½-inch drives. They are electrically identical to 5¼-inch drives, and using ADOS (from Spectrosystems), you can store up to a 350K file on each side of the disk. Some of the hard drive systems for the CoCo (like Burke & Burke's or RGB System's) can also handle large files under Disk BASIC. (Of course, they cost a few hundred dollars.) I do recommend that you get ADOS, if only to access your FD 502 on both sides (as if it were two drives). This will not increase the size of the biggest file you can store, but it will allow you to store twice as much on a disk.

**Artifact Colors on the CM-8**

*Is it possible to build a TV tuner that hooks up to the CM-8 monitor or to add a composite video input to the CM-8 monitor with some adapter or hardware project? I bought a CM-8 and am unable to see the red and blue artifact colors in the many games that use the PMODE 4 screen.*

*Perry M. Dueck*
*Rosenort, Manitoba*

You *cannot* modify the CM-8 for RF or composite video input. While it is technically possible to do what you ask, there are no commercial devices on the market to do that and cost less than a brand new Magnavox monitor. Making such a device from scratch would involve considerable design effort, and no one who could make such a device would bother to make one for the CM-8. Those who have not yet bought an RGB monitor should note that the CM-8's lack of composite video input makes it *incapable* of displaying proper PMODE 4 artifact colors. The Magnavox monitor (sold by many RAINBOW advertisers) has composite video inputs (as well as other inputs) and has a sharper, higher resolution screen than the CM-8.

I suggest that those who have a CM-8 buy *RGB Patch* from Microcom. This program will allow the CoCo 3 to display some degree of "artifact color" on a CM-8 when used with most Disk BASIC games and other graphics programs. Sadly, *RGB Patch* will not help with programs running under OS-9 (including the newer Tandy OS-9 games like *Rocky's Boots* and *Robot Odyssey*).

Also, see Steven Ostrom's "Artifact

Colors on CoCo 3's RGB,"(February '88, Page 114).

### Specifying CoCos

*I have a CoCo 2 (Model 26-3127B). What sort of a CoCo is that? Also, where can I get the 256K/512K Super RAM cartridge?*

*Michael D.*
*Zanesville, OH*

The Model 26-3127B is the last 64K Extended BASIC Color Computer 2 that Tandy made before discontinuing production of the CoCo 2. Its circuit board was set up so that it could accept 64K of memory in any of three different ways: eight 64K-by-1-byte chips on the main board, eight 64K-by-1-byte chips on a plug-in satellite board, or two 64K-by-4-byte chips in two 20-pin sockets on the main board. This model also featured the T1 VDG chip that, with special software, supported lower-case characters in the 32-column video mode.

The 256K/512K Super RAM is sold by CRC in Canada. It is a RAM-disk card that plugs into the Multi-Pak Interface. It works quite well under OS-9 but has limited compatibility with Disk BASIC programs.

### Monitoring Questions Super VHS, 80-Columns and 3½-Inch 80-Track Drives

*I have three questions. First, will the Magnavox 8CM515 monitor support the new super VHS video format? Second, my television cuts off the last two or three characters on the left-hand side of the screen when I put my CoCo 3 in 80-column mode. What can I do about this? Finally, how can I use 3½-inch 80-track drives under Disk BASIC?*

*Bill Sanders*
*Chula Vista, CA*

First, the Magnavox 8CM515 does not offer the sort of chromanance/luminance video input used with the super VHS format video signals. However, if that format catches on, adapters that will convert a chromanance/luminance signal to a RGB signal should become available commercially. Such adapters, if and when they are available, will allow any RGB analog-capable monitor to be used with the super VHS format.

Second, your problem with missing characters is caused by the *overscan* setting for the horizontal-width control. This is common to most broadcast TV sets. The CoCo 3's 40- or 80-column mode was not really designed for use with broadcast televisions. In fact, programmers who write 40-column based software for CoCo 3s with television monitors know about this problem and don't use the extreme left columns. In theory you could open up your TV and adjust the horizontal width internally (usually there is a ferrite slug in a coil somewhere that controls this), but when watching TV shows you'd probably see a black border at the left.

Finally, Disk BASIC is poorly suited to use with 80-track drives, and I recommend that you do not try it. If you insist on trying, check with Burke & Burke about its *Hyper I/O*, or with Spectrosystems about ADOS. Those companies make patches that (to a certain extent) will allow you to use 80-track drives with Disk BASIC.

### Upgrading the Modemphone

*Is there any way to upgrade a Tandy Modemphone to run at 1200 or 2400 baud?*

*Keith H. March*
*(KEITHMARCH)*
*Continental, OH*

I'm afraid that 1200- and 2400-baud modems are different both from each other and from 300-baud modems (more expensive to make, too). There is no reasonable way to convert one to another. You *must* buy a new modem if you want higher baud-rate capability than your current modem supports.

### Major Circuitry Differences

*A circuit for the CoCo 1's color monitor driver appeared in* Hot CoCo, *August '83. I was unable to get this circuit to work on a CoCo 2. Can you help me?*

*Fulton Smith, Jr.*
*Southfield, MI*

Even though the circuits may appear similar at first glance, the color video circuitry of the CoCo 2 is quite different from that of the CoCo 1. Unlike the CoCo 1, the CoCo 2 uses the RF modulator portion of the 1372 chip. Therefore, there is virtually no color video signal available where there is on the CoCo 1 circuits. Color monitor driver circuits for the CoCo 2 are considerably more complicated than those for the CoCo 1, and because there were several available commercially when the CoCo 2 was in production, I never bothered to develop one myself. Now that the CoCo 2 is no longer in production, many of those monitor drivers may not be available. Try Computerware, and check the ads in RAINBOW for other possible sources.

### ADOS to the Rescue (Again)

*How can I permanently program F1 and F2 to complete various functions or commands? How can I do the same with other keys?*

*Claud Gervais*
*Herouxville, Quebec*

Although frequent readers of this column may be tired of seeing me plug the system, ADOS (sold by Spectrosystems) is the answer to your question. Once configured and burned into the EPROM that will replace your Disk BASIC ROM, ADOS allows you to have single key strokes produce customized results *permanently*, (i.e., creating various BASIC programming word or multiple-word commands).

### Asking the Impossible

*Can I use a CoCo 3 and a DCM 6 modem to send* Spectaculator *worksheets from Ymodem to my company's FAX machines?*

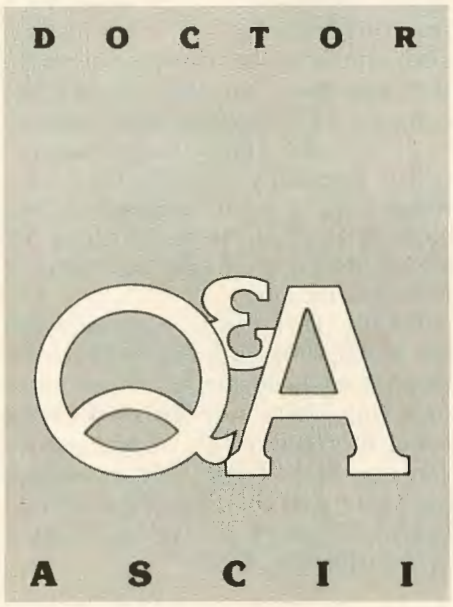
*Augusto Vajsest*
*Lima, Peru*

I'm afraid that is not possible for two reasons. First, spreadsheets consist of character, or ASCII, data. FAX data consists of graphic, or photographic, data. Second, the way in which 300-baud computer modems encode data differs completely from the way in which the modems in FAX machines encode their data.

**Your technical questions are welcomed. Please address them to CoCo Consultations, THE RAINBOW, P.O. Box 385, Prospect, KY 40059.**

**We reserve the right to publish only questions of general interest and to edit for brevity and clarity. Due to the large volume of mail we receive, we are unable to answer letters individually.**

**Questions can also be sent to Marty through the Delphi CoCo SIG. From the CoCo SIG> prompt, pick Rainbow Magazine Services, then, at the RAINBOW> prompt, type ASK (for Ask the Experts) to arrive at the EXPERTS> prompt, where you can select the "CoCo Consultations" online form which has complete instructions.**




**By Richard E. Esposito**
**Rainbow Contributing Editor**
**with Richard W. Libra**

### *T/S Spell* and *TW-64* Compatibility

*I recently purchased Tandy's OS-9 based spelling checker,* T/S Spell. *Files saved to disk under my favorite word processor,* TW-64, *will not read into* T/S Spell. *I assume that the difference in directory locations between Disk* BASIC *and OS-9 is at least part of the problem. Both are super programs. Is there a way to make them compatible? I have a CoCo 3 with 128K, two Radio Shack disk drives, a CM-8, a DMP-200 printer, and a CCR-81 recorder.*

*Edward Scott*
*Canaan, CT*

Rx The directory structures for OS-9 and Disk BASIC differ completely. To check the spelling of a *TW-64* document with *T/S Spell*, save the document in ASCII format and then use a file transfer program (like *TRSCopy*) to move it over to an OS-9 diskette.

### ROM Pack Problems

*I have just received my new 128K CoCo 3. I have a Radio Shack Multi-Pak Interface (MPI), cat. #26-3024. When I use a power strip to power up the computer and MPI together, everything works except my* EDTASM+ *pak. I have no problem switching between other packs, but when I switch to* EDTASM+ *the screen fills with garbage. Will a new PAL chip in the MPI solve this problem? Is there a patch to upgrade OS-9 1.01 to Level II? Is the fan in the FD 501 disk drive necessary, or can I remove it? Where can I get an extension cable for my keyboard?*

*Bill Irwin*
*Toledo, OH*

Rx First, count yourself lucky that only one of your ROM packs is not compatible with the CoCo 3. The PAL chip upgrade is unrelated to this problem. You could use Roger Schrag's patches to move your *EDTASM+* code to disk. (see "Patching *EDTASM* to Run on Disk," December '82, Page 29; "Patching The Patch: *EDTASM* to Disk Revealed," April '83, Page 194; or "Superpatch for *EDTASM*," September '83, Page 66). Second, OS-9 Level I and Level II are completely different prodcts. There is no patch or upgrade available; however, you *can* use the assembler and some of the utilities from Level I with Level II. Third, the fan in the 501 is there to dissipate the heat generated from the power supply. Removing the fan could shorten the disk drive's life. Finally, Marty Goodman has contracted with several RAINBOW advertisers to sell his keyboard extender cable.

*Richard Esposito is the principal engineer for BDM Corporation. He holds bachelor's, master's and doctorate degrees from Polytechnic Institute of Brooklyn. He has been writing about microcomputers since 1980.*

*Richard Libra is a simulator test operator for Singer Link Simulation Systems Division.*

### Needs a Patch

*I typed in the listing for* PAKXFER *from the December '87 issue ["Pak to Disk Transfer," Page 152]. I also looked over the patches for problem ROM packs listed in your March '88 column [Page 16]. Do you have a patch for recording the new CoCo 3 ROM Packs to disk? I am interested in recording* Thexder *and* Shanghai.

*David Morrison*
*Brewer, ME*

Rx See the August '88 "CoCo Consultations" [Page 162].

### Information, Please

*Where I can find extensive information on the following: CoCo's sound I/O, data transmission through the RS-232, the ROM port, CoCo 3's new machine language instructions and addressing the disk drive directly (not through ROM subroutines)?*

*Dave Brain*
*Troutdale, OR*

Rx Order the CoCo 3 Service Manual (Part #MS-2603334, $15.60) from Tandy National Parts, and read Scott Honaker's "Exercise Your Drives" [RAINBOW, June '88, Page 110].

### Try the Clone

*I bought a copy of* Xterm *because the ad said that it works with the CoCo's serial port. This may be true, but I have OS-9 Level II, which will not work with the CoCo 2.* Xterm *and* Wiz *both call for the RS-232 Pak. According to my local Radio Shack, the RS-232 Pak is no longer available. I would really like to use my OS-9 with a terminal program, but they all call for the RS-232 Pak. Is there a substitute?*

*Michael E. Phelps*
*Belleville IL*

Rx Disto is currently marketing an RS-232 SuperPack clone of the original Tandy Pak (without the virtually useless ROM-based communications software) for $49.95.

### Device Descriptor Problems

*I have a 512K CoCo 3 with a Multi-Pak Interface, a hard disk interface, 15-Meg hard drive, and OS-9 Level II. I can't get OS-9 to talk to the hard drive. If I boot with Level I Version 2.00 and attempt to format /h0 I get Error #247 (seek error). When I copy the device descriptor and device driver to a Level II disk and try to format, I get Error #237 (memory full). I don't really want to reformat the drive, but I*

*can't access any of the data already stored there. The hard drive worked fine with OS-9 Level I (both versions). My problems started after I had the Multi-Pak upgraded to work with Level II. Now that the Multi-Pak has been modified, I can't even use it with Level I! My floppy controller works fine in Slot #4 of the Multi-Pak, so I don't think the problem is in the Multi-Pak itself. Should the software be modified? I have spoken to five different people at Radio Shack stores, and no one knows what to do about this problem.*

*Charles Steinfeldt*

**Rx** You need to change offset $0E of each of your hard disk device descriptors from $FF to $7F (probably `/h0` and `/dd`). The hard drive driver and descriptor for OS-9 Level II are included in the *Development System* from Radio Shack.

### A Simple Sparklie Solution

*Is there a simple way to address the sparklie problem that does not entail replacing the soldered-in microprocessor or the $50 GIME chip?*

*Juan Diaz*
*San Juan, PR*

**Rx** I solved the sparklie problem (small bouncing dots on the screen during 2-Mhz operation) on my CoCo 3 by following Roger Krupski's advice. I replaced R9 and R10 (47-ohm resisters) with 100-ohm resistors and C10 and C11 (39-pF capacitors) with 47-pF capacitors. I carefully clipped the old resistors and capacitors, and I soldered the new ones onto the remaining leads — unsoldering was not required. For more information on the sparklie problem, see Marty Goodman's "Quick Fixes," October '88, Page 58.

### Reprint Request

*I tried to get a reprint of your article, "Disk Utilities," from CW Communications, but I did not receive a reply. Could you suggest any other way to get a reprint of this article?*

*Floyd Craig*
*Toronto, OH*

**Rx** Try calling its business office at 1-800-441-4403.

### Upgrade Prescription

*I want to upgrade an early CoCo 1 D-Board to 64K. I have* Color Computer Secrets Revealed *by Disk 'N Data, which shows the upgrade of later models but does not provide the directions needed to upgrade earlier models. Can you help?*

*Lonnie Morosic*
*McCook, NE*

**Rx** See B. H. Alsop's "D-Board 64K Upgrade," RAINBOW, March '83 [Page 100]. This article offers a unique approach using modified sockets, which avoids the need to cut traces.

### Hard Disk Guide

*I have been considering getting a hard disk for my CoCo 2, but there are several things that I need to know before I invest $600 to $700. Does a hard disk work on the CoCo like it does on an MS-DOS computer? Is there an established hierarchy of directories like in MS-DOS or OS-9? There are several systems advertised in RAINBOW, but the ads don't give enough information about the product to help me choose a system.*

*Erasmo A. Martinez*
*Watertown NY*

**Rx** I have been using a Seagate ST-225 20-Meg hard disk with a Western Digital controller and a Burke & Burke CoCo XT-RTC interface for over a year. It cost me around $450. OS-9 has the same hierarchical directory structure as MS-DOS, but it had it first. OS-9 was designed for — and runs well on — a hard drive. Disk BASIC, on the other hand, was designed for 35-track, single-sided floppy operation. Therefore, its hard disk operation techniques vary from using the hard drive as several floppies to modifying Disk BASIC to handle the whole drive. While OS-9's operation with a hard drive works with all of your software, Disk BASIC's operation will reveal some incompatibilities.

### A Patch Explained

*In your June '87 column [Page 90] you answered a question about 3½-inch drives and offered a short program patch to be used with* `Modpatch`. *Near the end of the answer you stated, "You can add the missing descriptors to the modules directly and build the system directly with* `config`*." You were talking about* `/dd` *and* `/d0` *for 80-track drives. How do you do this? I have two 40-track double-sided disk drives, one 80-track, 3½-inch disk drive and* DMode *from Computerware (only for 40 tracks as far as I know). I want to get the* `Save` *command for Level II. Would you give me the patch program and the steps I need to follow. Also, is* DMode *geared for 80 tracks or do I have to buy* SDisk3*?*

*E.G. Douglas*
*Stillwater OK*

**Rx** If you have Kevin Darling's *DMode*, you can patch the descriptors directly on disk in your `Config Modules` directory. If you patch with `Modpatch` and then use `Save`, you'll need to know the address offsets in the descriptors (Figure 1).

You may also want to modify offset $14, which controls the step rate ($00 for 30 ms, $01 for 20 ms, $02 for 12 ms and $03 for 6 ms). Do not forget to verify. *SDisk3* is not needed if you only want to support other size drives or vary the step rate under OS-9 Level II. The Level I drivers for OS-9 were hard-coded for single-sided operation. Consequently, *SDisk*, or an equivalent, was required for two-sided operation. However, with Level II, all you need for different size drives is to modify the device descriptors.

| | Single-sided | Double-sided | Double-sided |
|---|---|---|---|
| Offset | 35 track value | 40 track value | 80 track value |
| $16 | $01 | $01 | $03 |
| $18 | $23 | $28 | $50 |
| $19 | $01 | $02 | $02 |

**Figure 1**

**For a quicker response, your questions may also be submitted through RAINBOW's CoCo SIG on Delphi. From the CoCo SIG> prompt, pick Rainbow Magazine Services, then, at the RAINBOW> prompt, type `ASK` for "Ask the Experts" to arrive at the EXPERTS> prompt, where you can select the "Doctor ASCII" online form which has complete instructions.**

*Building on the skills developed in earlier games*

# Growing Up With CoCo

By Fred B. Scerbo
Rainbow Contributing Editor

The last three columns have presented a series of four early-childhood education programs: *Opposites* (parts I and II) and *Match Game of Opposites* (parts I and II). From the mail I have received on the first installment, I believe that these programs will help fill a vacuum in the CoCo Community's software library.

This month, let's look at the final installment in this series. *Picture This* allows children to use all the skills developed in the first four programs and take them one step further. While some of the graphics will be the same as those in the last four programs, the DATA statements are *not* interchangeable. The alphanumeric part of each graphics string has been deleted. Instead, graphics text characters will be represented by an array of graphics alphanumeric strings.

**Our Purpose**

Why do we need this fifth program? In both the *Opposites* and *Match Game of Opposites* series, we dealt strictly with abstract concepts. We related a picture to a word and to its opposite.

In *Picture This*, the user must take this knowledge and correctly insert the correct word in each sentence. Each concept's graphic representation is still given, but this time each concept is shown individually. For each concept, a sentence with a missing word (blank) represented by the graphic is presented with a series of possible answers. The question would appear in the following format:

```
THIS LITTLE SNAIL IS
VERY . . .
  A) THICK
  B) SLOW
  C) DRY
  D) FAST
```

In this example, the screen would include our snail graphic. (So *that's* where our old friend the snail from *Snail Invaders* [February '82, Page 17] and *Snail's Revenge* [July '83, Page 138] turned up. I have promised long-time readers his return for some time.)

As with quiz programs presented in previous issues, the user needs only to press the letter representing the correct response. The program corrects and scores the responses.

**Typing in the Program**

This program listing is much longer than listings for the last four programs. Since you cannot use the DATA statements from previous months, type in the program very carefully. There are no bugs in the program. Any bugs that show up will be your own. To be safe, get RAINBOW ON TAPE or DISK for a bug-free copy.

Every data line that includes a statement also has an asterisk (*). This will be recognized as an underline in the program. I thought that indicating a blank in this manner would be more attractive than using a string of periods. Therefore, type each data line exactly as you see it.

**Using the Program**

When you run the program, the familiar title screen will appear. You will be asked to select a level from one to eight by pressing the appropriate number. There are a total of eighty graphics and statements, so each level will present 10 questions. Each set of 10 will be assorted randomly, but you can control the set shown by selecting the level.

As with our other quiz programs, you only need to select the letter corresponding to the correct choice. If the answer is correct, the screen will display, "Very Good." An incorrect response will cause the screen to print "Sorry!" In both cases, an arrow will flash next to the correct response.

If you press ENTER, you will move to the next screen. You may also press @ to go to the scorecard. At that point, you will be asked if you want to try again. You may then press C to continue where you left off, Y (yes) to start a new quiz or N (no) to quit.

That's all there is to it. Young users may need an adult to read the sentences. This promotes the whole educational process with your children and gives you and the kids some *fun* time together. (Learning can be fun for everyone, right?)

**Conclusion**

This month's listing is *very* long. Since we covered the educational theories in the last three columns, there is no need to repeat them here. I hope you find this program as useful as the ones from the last three months. They make a nice set, and they also help teach some important skills.

Once again I must thank those of you who have donated your old silver CoCos to our special needs classes. It seems that just when I think I have seen the last donation, another kind soul sends us another large box. As always, the machines are put to good use in one of our special needs classes. See you next month. □

*If you have an idea for the "Wishing Well," submit it to Fred c/o THE RAINBOW. Remember, keep your ideas specific, and don't forget this is BASIC. All programs resulting from your wishes are for your use, but remain the property of the author.*

*Fred Scerbo is a special needs instructor for the North Adams Public Schools in North Adams, Massachusetts. He holds a master's in education and has published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.*

| | | | | | |
|---|---|---|---|---|---|
| 45 | 208 | 635 | 143 | 1170 | 175 |
| 105 | 251 | 705 | 141 | 1230 | 253 |
| 175 | 209 | 790 | 170 | 1280 | 84 |
| 240 | 252 | 865 | 145 | 1335 | 35 |
| 315 | 42 | 940 | 65 | 1380 | 119 |
| 395 | 24 | 990 | 0 | 1440 | 115 |
| 470 | 254 | 1045 | 230 | 1495 | 196 |
| *530* | 70 | 1115 | 232 | END | 155 |
| 580 | 86 | | | | |

**The listing:** PICTURES

```
1 PCLEAR1
2 REM ************************
3 REM *      PICTURE THIS      *
4 REM *    BY FRED B.SCERBO    *
5 REM *     6Ø HARDING AVE.    *
6 REM *  NORTH ADAMS,MA Ø1247  *
7 REM *   COPYRIGHT (C) 1988   *
8 REM ************************
9 CLEAR1ØØØ
1Ø CLSØ:PRINTSTRING$(64,252);
15 FORI=1TO224:READA:PRINTCHR$(A
+128);:NEXT:PRINTSTRING$(64,243)
;
2Ø DATA61,6Ø,61,52,62,53,6Ø,58,6
2,61,6Ø,58,58,16,58,62,6Ø,58,62,
6Ø,21,28,3Ø,29,21,24,29,2Ø,3Ø,21
,28,29
25 DATA53,,53,,58,53,,58,58,53,4
8,58,58,,58,58,,58,58,,21,,26,21
,21,16,21,16,26,21,16,21
3Ø DATA53,,53,,58,53,,48,,53,48,
,58,,58,58,,58,58,,,,26,,21,,21,
16,26,21,,16
35 DATA53,6Ø,6Ø,48,58,53,,,,53,4
8,,58,,58,62,62,56,62,6Ø,,,26,,2
1,28,29,16,26,2Ø,28,29
4Ø DATA53,,,,58,53,,,,53,48,,58,
,58,58,57,,58,,,,26,,21,,21,16,2
6,,,21
45 DATA53,,,,58,53,,58,,53,48,,5
8,,58,58,53,,58,,,,26,,21,,21,16
,26,16,18,21
5Ø DATA6Ø,56,,52,6Ø,52,6Ø,56,,6Ø
,56,,6Ø,6Ø,56,56,48,56,6Ø,6Ø,,2Ø
,28,,28,24,28,2Ø,28,16,28,28
55 PRINT@389,"   BY FRED B.SCERB
O   ";
6Ø PRINT@421," COPYRIGHT (C) 19
88  ";
65 DIM P$(8Ø,2),A$(2),B$(1Ø),C$(
1Ø),A(1Ø),N(1Ø),B(4),C(4),D(4),E
(4),F(4),AO(1Ø)
7Ø DIM L$(3Ø),H$(8Ø,4),AB(4)
75 FORI=1TO3:READ C(I),D(I),E(I)
```


# TANDY COMPUTER DISCOUNTS

## COLOR COMPUTERS

| | |
|---|---|
| 26-3334 CoCo 3 | 165.00 |
| 26-3215 CM-8 color monitor | 259.95 |

## PRINTERS

| | |
|---|---|
| 26-2802 DMP 106 | 179.95 |
| 26-2808 DMP 440 | 599.00 |
| 26-2814 DMP-132 | 299.95 |

Complete line of Tandy (Daisy Wheel) print wheels

## MSDOS COMPUTERS

| | |
|---|---|
| 25-1053 TANDY 1000 HX | 599.00 |
| 25-1401 TANDY 1000 SL | $ CALL |
| 25-1601 TANDY 1000 TL | $ CALL |
| 25-4072 TANDY 3000 NL | 1,500.00 |
| 25-1023 CM-5 color monitor | 249.95 |
| 25-1020 VM-4 Monochrome monitor | 110.00 |

***We Carry the Complete Line of Tandy Computer Products at Discount Prices***

**CALL FOR A FREE PRICE LIST 800-257-5556**
**IN N.J. CALL 609-769-0551**

**WOODSTOWN ELECTRONICS**

Rt. 40 E. WOODSTOWN, N.J. 08098

# VIP Disk-ZAP

**RAVED ABOUT IN THE APRIL 1983 "RAINBOW"**

VIP DISK-ZAP

Now you can retrieve lost data on any disk. VIP Disk-Zap is the ultimate repair utility for repair of most disk errors. VIP Disk-Zap verifies diskettes, reads and writes any sector and lets you retrieve all types of bashed text files, BASIC and ML programs. VIP Disk-Zap includes a 50 page tutorial manual **DISK $24.95**

# VIP Terminal

**RATED BEST IN JANUARY 1984 "RAINBOW"**

VIP TERMINAL

For your important communications needs you've got to go beyond software that only lets you chat. You need a smart terminal so that you can send and receive programs and messages and print them! The VIP Terminal features 32, 51, 64 or 85 characters by 21 or 24 lines on the screen and has a 43K byte buffer to store information. **DISK $29.95**

***Turn the page for more VIP software!***

```
,F(I):NEXT:FORI=1TO3Ø:READL$(I):
NEXT:FORI=1TO2:READA$(I):NEXT:FO
RI=1TO8Ø:READP$(I,1),P$(I,2):FOR
LL=1TO4:READ H$(I,LL):NEXTLL:NEX
TI
8Ø COLOR1,Ø
85 GOTO18Ø
9Ø KK=2Ø
95 Z=LEN(A$):IFZ<23THENL$=A$:GOS
UB115:RETURN
1ØØ FORI=22TO1STEP-1:IFMID$(A$,I
,1)<>" "THEN11Ø
1Ø5 L$=LEFT$(A$,I-1):A$=RIGHT$(A
$,LEN(A$)-I):GOSUB115:KK=KK+16:G
OTO95
11Ø NEXTI:GOTO95
115 DRAW"CØBMØ,"+STR$(KK)
12Ø Q=LEN(L$):FORI=1TOQ:K$=MID$(
L$,I,1):K=ASC(K$)-64
125 IFK=-32THENK=27ELSEIFK=-18TH
ENK=28ELSEIFK=-1THENK=29ELSEIFK=
-22THENK=3Ø
13Ø DRAW L$(K)
135 NEXT
14Ø RETURN
145 DATA13Ø,6,246,8Ø,6,86,12Ø,16
2,13Ø,86,246,162
15Ø DATA U8R8D4NL8D4BR4,R2U8L2R8
D4NL8D4NL8BR4,NR8U8R8D2BD4D2BR4,
R2U8L2R8D8NL8BR4,NR8U4NR8U4R8BD8
BR4,U4NR8U4R8BD8BR4
155 DATA NR8U8R8BD4NL4D4BR4,U8D4
R8U4D8BR4,BR2R2U8L2R4L2D8R2BR6,B
R2NU4R8U8L4R8BR4BD8
16Ø DATA U8D4R4NE4F4BR4,NU8R8NU2
BR4,U8F4E4D8BR4,U8F8NU8BR4,U8R8D
8NL8BR4,U8R8D4NL8BD4BR4,U8R8D8NL
8NH4NF2BR8,U8R8D4L8R4F4BR4
165 DATA R8U4L8U4R8BD8BR4,BU8R8L
4D8BR8,NU8R8NU8BR4,BU8D4F4E4U4BD
8BR4
17Ø DATA NU8R6NU8R6NU8BR4,E4NH4N
E4F4BR4,BU8F4NE4D4BR8,BU8R8G8R8B
R4,BR8,BR2NU2BR8,BR2BU8U2R8D2G4B
D4L2BR8,R4ØBR4
175 DATA"BM2,124CØ","BM13Ø,124CØ
"
18Ø PMODEØ,1:PCLS1:SCREENØ,Ø:LIN
E(Ø,114)-(13Ø,192),PRESET,B:LINE
(6,12Ø)-(124,184),PRESET,B:PAINT
(2,154),Ø,Ø
185 FORI=1TO1Ø
19Ø AO(I)=RND(1Ø):IFN(AO(I))=1TH
EN19Ø
195 N(AO(I))=1:NEXTI
2ØØ PRINT@453,"  SELECT LEVEL (1
-8)  ";
2Ø5 X$=INKEY$:XX=RND(-TIMER):IFV
AL(X$)=ØTHEN2Ø5ELSEIFVAL(X$)>8TH
EN2Ø5
21Ø SCREEN1,1:LL=VAL(X$)*1Ø-1Ø:F
ORII=1TO1Ø:DRAW A$(1):DRAWP$(AO(
II)+LL,1)
215 A$=P$(AO(II)+LL,2)+".":GOSUB
9Ø
22Ø FORYY=1TO4:N(YY)=Ø:NEXTYY:FO
RYY=1TO4
225 AB(YY)=RND(4):IFN(AB(YY))=1T
HEN225
23Ø N(AB(YY))=1:IF AB(YY)=1 THEN
 FF=YY
235 NEXTYY:V=Ø
24Ø FORYY=1TO4:KK=KK+16:A$="
"+CHR$(64+YY)+". "+H$(AO(II)+LL,
AB(YY)):GOSUB95:NEXTYY
245 X$=INKEY$:IFX$=""THEN245
25Ø IFX$="@"THEN151Ø
255 V=ASC(X$):IFV<65THEN245ELSEI
FV>68THEN245
26Ø V=V-64:IFAB(V)=1THEN27Ø
265 NW=NW+1:DD=KK:A$="          S
ORRY":KK=146:DRAW"S8":GOSUB95:KK
=DD:DRAW"S4":GOTO275
27Ø NC=NC+1:DD=KK:A$="          V
ERY":KK=146:DRAW"S8":GOSUB95:KK=
KK+26:A$="          GOOD":DRAW"S8
":GOSUB95:KK=DD:DRAW"S4"
275 V=1:IFKK=1ØØTHENKK=32ELSEIFK
K=84THENKK=16
28Ø KK=KK+(16*FF):KK$=STR$(KK):D
RAW"BM4,"+KK$
285 DRAW"CØR16NH4NG4":FORYY=1TO9
Ø:NEXTYY
29Ø X$=INKEY$:IFX$=CHR$(13)THEN3
ØØELSEIFX$="@"THEN151Ø
295 DRAW"C1NH4NG4L16":FORYY=1TO9
Ø:NEXT:GOTO285
3ØØ COLOR1,Ø:LINE(Ø,Ø)-(256,11Ø)
,PSET,BF:LINE(8,122)-(122,182),P
SET,BF:LINE(132,122)-(256,182),P
SET,BF:NEXTII
3Ø5 FF=1:GOTO151Ø
31Ø DATA"BR6ØBD4F2ØL1ØD24L2ØU24L
1ØE2Ø"
315 DATA THIS ARROW IS POINTING
*
32Ø DATA UP,DOWN,LEFT,RIGHT
325 DATA"BR6ØBD4L1ØD24L1ØF2ØE2ØL
1ØU24L1Ø"
33Ø DATA THIS ARROW IS POINTING
*
335 DATA DOWN,UP,LEFT,RIGHT
34Ø DATA"BR16BD2ØR8ØM-4,+2ØL36M-
4,-18NL36BR12BU4E4UH4UE4BR1ØG4DF
4DG4BR1ØE4UH4UE4"
345 DATA THIS PICTURE SHOWS SOME
THING *
35Ø DATA HOT,COLD,DRY,WET
355 DATA"BR6ØBD2ØL4ND6L6ND2L4ND4
L2M+16,+32M+16,-32L16R4ND8R6ND4R
6L2U4H2U2H2L2H2L12G2L2G2D2G2D4"
36Ø DATA THIS PICTURE SHOWS SOME
```

```
THING *
365 DATA COLD,HOT,DRY,WET
37Ø DATA"BR5ØBD56R4U3ØR4U1ØR2U1Ø
E2U4RD4F2D1ØR2D1ØR4D3ØR4L22BR8BU
2U24BR4D24"
375 DATA THIS BUILDING IS SOMETH
ING *
38Ø DATA BIG,LITTLE,THIN,WIDE
385 DATA"BR68BD52H4L4U2NR4D2L4NU
ND4L4U2L4D2R4NH6L2G4"
39Ø DATA THIS INSECT IS SOMETHIN
G *
395 DATA LITTLE,BIG,WIDE,THIN
4ØØ DATA"BR24BD36E12G6F2ØR2ØE2ØF
6H12BL14H2G4L4H4G2BU1ØBL4NU4L2U6
E4R2BR26L2G4D6L2U4"
4Ø5 DATA A SMILE MEANS YOU ARE *
41Ø DATA HAPPY,SAD,SLEEPY,HUNGRY
415 DATA"BR34BD5ØH12F6E12R36F12G
6E12BU16BL28H2G4L4H4G2BU1ØBL4NU4
L2U6E4R2BR26L2G4D6L2U4"
42Ø DATA A FROWN MEANS YOU ARE *
425 DATA SAD,HAPPY,SLEEPY,HUNGRY
43Ø DATA"BR2ØBD22D2ØM+3Ø,+1ØNU2Ø
R5ØU2ØNL5ØM-3Ø,-1ØND8L5ØM+3Ø,+1Ø
M-3Ø,-1ØE2ØR5ØG2ØL1ØNE2ØL1ØNE2ØL
1ØNE2ØL1ØNE2Ø"
435 DATA THE BOX BELOW IS *
44Ø DATA OPEN,CLOSED,HEAVY,LIGHT
445 DATA"BR12BD16D2ØM+3Ø,+1ØNU2Ø
R6ØU2ØNL6ØM-3Ø,-1ØL6ØM+3Ø,+1ØR12
M-3Ø,-1ØR12M+3Ø,+1ØR12M-3Ø,-1ØR1
2M+3Ø,+1Ø"
45Ø DATA THE BOX BELOW IS *
455 DATA CLOSED,OPEN,HEAVY,LIGHT
46Ø DATA"BR9ØBD52U2E8U32H4L4G2D1
ØF2R4E4BL12U12H4L4G4D12F4R4E4BL1
2U12H4L4G4D12F4R4E4BL12U12H4L4G4
D12F4R4E4BL12D2G4L4M-1Ø,-6M-1Ø,-
2L2G4D4M+8,+4D2M+2Ø,+12F1ØM+6,+2
F2BE1ØH1ØM-8,-3BD36"
465 DATA THIS SHOWS YOUR * HAND
47Ø DATA LEFT,RIGHT,FAT,THIN
475 DATA"BR28BD52U2H8U32E4R4F2D1
ØG2L4H4BR12U12E4R4F4D12G4L4H4BR1
2U12E4R4F4D12G4L4H4BR12U12E4R4F4
D12G4L4H4BR12D2F4R4M+1Ø,-6M+1Ø,-
2R2F4D4M-8,+4D2M-2Ø,+12G14G2BH1Ø
E1ØM+8,-3"
48Ø DATA THIS SHOWS YOUR * HAND
485 DATA RIGHT,LEFT,FAT,THIN
49Ø DATA"BR3ØBD6D34R4E2U1ØR12F4R
12E4R12F4D12R1ØU2ØH8L18H4L4U8R12
U4L28D4R12D8L4G4L12U8H2L4BM+6Ø,+
4ØF4D4G2L4H2U4E4"
495 DATA THE FAUCET SHOWN BELOW
IS *
5ØØ DATA WET,DRY,HOT,COLD
```


# THE POWER STONES OF ARD

**THE QUEST FOR THE SPIRIT STONE**

RAINBOW CERTIFICATION SEAL

You're tired, you're hungry, not to mention you're badly injured. No one in town seems to want to talk to you. Your magic sword has stopped glowing, the room is dark, you're out of spells, you can't get your wand to work, you won't swear to it but you may be lost, you have no idea what that last puzzle meant, and you hear something large moving just beyond the only door. The old sage warned you there would be days like this!

**"QUEST FOR THE SPIRIT STONE"** is an Adventure that will keep you playing for hours. It features single keystroke commands, 16 color graphics, 100% Hi-Res graphics screens, full game save, extensive playing area, level advancement, and the disk is not copy-protected. You choose your character's name, race, sex, and ability scores. The use of arrow keys simplify movement. This one is easy to play but a challenge to complete!

*"Fun and challenging . . . should find its way into many CoCo 3 software collections."* *8/88 RAINBOW review*

**ONLY $18.00** AND WE PAY SHIPPING!

COLOR COMPUTER 3 AND ONE DISK DRIVE REQUIRED

North Carolina residents add 5% sales tax

**Send check or money order to:**

THREE C's PROJECTS

**P.O. Box 1323, Hamlet, NC 28345**

**or call: (919) 582-5121**

# VIP Calc

**"MORE USEABLE FEATURES"**

**FEBRUARY 1985 "RAINBOW"**

VIP CALC

Now every CoCo owner has access to a calculating and planning tool better than VisiCalc™, containing all its features and commands and then some. VIP Calc displays 32, 51, 64 or 85 characters by 21 or 24 lines right on the screen. VIP Calc allows up to a 33K worksheet with up to 512 columns by 1024 rows! In addition, VIP calc has multiple windows which allow you to compare and contrast results of changes. Other features include 16 DIGIT PRECISION • trig. functions • averaging • algebraic functions • column and row ascending or descending SORTS • locate formulas or titles in cells • block move and replicate • global or local column width • limitless programmable functions • works with any printer, Embed printer control codes for customized printing. Combine spreadsheet tables with VIP Writer documents to create ledgers, projections, statistical and financial budgets and reports. Requires 64K. **DISK $59.95**

# VIP Speller

**INCLUDES 50,000 WORD DICTIONARY**

VIP SPELLER

VIP Speller works with ANY ASCII file created by most popular word processors. It automatically checks text files for words to be corrected, marked for special attention or even added to the 50,000 word Dictionary. You can even view the word in context. Words can be added to or deleted from the dictionary or you can create your own dictionary! **DISK $34.95**

***Turn the page for more VIP software!***

```
5Ø5 DATA"BR3ØBD6D34R4E2U1ØR12F4R
12E4R12F4D12R1ØU2ØH8L18H4L4U8R12
U4L28D4R12D8L4G4L12U8H2L4"
51Ø DATA THE FAUCET SHOWN BELOW
IS *
515 DATA DRY,WET,HOT,COLD
52Ø DATA"BR1ØBD4ØR1Ø2L8E1ØM-8,+4
L6U4H2L2G4R4D4F4L2ØE1ØM-8,+4L6U4
H2L2G4R4D4F4L2ØE1ØM-8,+4L6U4H2L2
G4R4D4F4L2ØE2ØM-16,+8L12U8H4L4G8
R8BE4NLBG4D8F8BU28BR4F6NU16NE6"
525 DATA THE ARROW POINTS TO THE
 * IN LINE
53Ø DATA FIRST,LAST,MIDDLE,SECON
D
535 DATA"BR1ØBD4ØR1Ø2L8E1ØM-8,+4
L6U4H2L2G4R4D4F4L2ØE1ØM-8,+4L6U4
H2L2G4R4D4F4L2ØE1ØM-8,+4L6U4H2L2
G4R4D4F4L2ØE2ØM-16,+8L12U8H4L4G8
R8BE4NLBG4D8F8BU24BR74F6NU16NE6"
54Ø DATA THE ARROW POINTS TO THE
 * IN LINE
545 DATA LAST,FIRST,MIDDLE,SECON
D
55Ø DATA"BR56BD26S2M+36,+1ØF16L2
H4L4G4H4L4G4H4L4G4H4L4G6D22G2L2N
H2R2E2U22H6L4G4H4L4G4H4L4G4H4L4G
4E16M+36,-1ØS4BU1ØR1ØE4NH4R6E4U2
H4L1ØG4L12NG4H6L8G4D6F4R6F4R4E2R
2R6R4BR16NE6NR2ØNF6"
555 DATA THE CLOUD IS * THE UMBR
ELLA
56Ø DATA OVER,UNDER,AROUND,INSID
E
565 DATA"BR56BD2S2M+36,+1ØF16L2H
4L4G4H4L4G4H4L4G4H4L4G6D18G2L2NH
2R2E2U18H6L4G4H4L4G4H4L4G4H4L4G4
E16M+36,-1ØS4BD36NE6NH6NG6NF6BR1
6NE6NF6R22"
57Ø DATA THE MARK IS * THE UMBRE
LLA
575 DATA UNDER,OVER,AROUND,INSID
E
58Ø DATA"BR16BD2ØE2NR8ØR16E8R6NG
4R6NG4R6NG4R6NG4R6NG4R6NG4NG4R6N
G4R6NG4R6NG4R6NG4F8D2G8NH4L6NH4L
6NH4L6NH4L6NH4L6NH4L6NH4L6NH4L6N
H4L6NH4L6H8L16NR8Ø"
585 DATA THIS FEATHER IS SOMETHI
NG *
59Ø DATA LIGHT,HEAVY,FAST,SLOW
595 DATA"BR26BD46R68M-14,-3ØL1ØU
6H4L12G4D6L1ØM-14,+3ØBR18BU8U12B
R6NR6D12R6NU12BR6U12R6D12NL6BR4N
U6BR4NU6U4R4D4L4BU22BL14L4U4R4D4
"
6ØØ DATA THIS WEIGHT IS SOMETHIN
G *
6Ø5 DATA HEAVY,LIGHT,FAST,SLOW
61Ø DATA"BR6ØBD48R8E4U1ØR4U6L4U6
H4L16G4D6L4D6R4D1ØF4R8BU6NE4NH4B
U8NLNR2BU6BL4NR2BR6R2BU16R6E2H2L
2ØG2F2R12BD2ØBL2ØH16D16F16R36E16
U16G16"
615 DATA AN ANGEL IS SOMEONE WHO
 IS *
62Ø DATA GOOD,BAD,RICH,POOR
625 DATA"BR6ØBD48R8E4U1ØR4U6L4U6
H4L16G4D6L4D6R4D1ØF4R8BU1ØNG4NF4
BU4NLNR2BU6BL4NR2BR6R2BU12E6D8L2
ØU8F6BL2ØD6G4L6NU1ØND2ØL6H4U6BR7
8NG4NF4D2ØG1Ø"
63Ø DATA A DEVIL IS SOMEONE WHO
IS *
635 DATA BAD,GOOD,RICH,POOR
64Ø DATA"BR2ØBD16D3ØNR56U3ØR6U16
R1ØF4G4L1ØD8R1ØD6R1ØD6R1ØD6R1ØD6
R1ØD6R26BU42BL3ØL2ØNE4NF4"
645 DATA THIS LITTLE FLAG IS * U
P
65Ø DATA HIGH,LOW,WINDY,SUNNY
655 DATA"BR2ØBD16D3ØNR56U3ØR16D6
R1ØD6R1ØD6R1ØD6R1ØD6R26L16U16R1Ø
F4G4L1ØD8BU26BR6NU16NH4NE4"
66Ø DATA THIS LITTLE FLAG IS MUC
H *
665 DATA LOWER,HIGHER,WINDY,SUNN
Y
67Ø DATA"BR32BD26NR5ØD2NR5ØD2R5Ø
D6L2D4R14U4L2U12H2U4H2U2H4L6D2F2
D2F2D8"
675 DATA A HAMMER IS SOMETHING *
68Ø DATA HARD,SOFT,LIGHT,DARK
685 DATA"BR36BD18H8U8R8F8E4R2ØF4
E8R8D8G8D1ØG4D2G8L2G4L8H4L2H8U2H
4U1ØBR1ØBD4R4NU2ND2NR4NE2NH2BR12
R4NU2ND2NR4NE2NH2BG8BD4NE4NH4D6N
F4NG4U6BR6NR2ØBL12NL2ØBR6D4BF4NF
1ØBH4BG4G1Ø"
69Ø DATA A CAT IS SOMETHING *
695 DATA SOFT,HARD,HEAVY,DARK
7ØØ DATA"BR3ØBD2D1ØNR3ØD4NR3ØL2D
4L2D4L2D4L2D12NR88D6R8NU6R8NU6R8
NU6R8NU6R8NU6R8NU6R8NU6R8NU6R8NU
6R8NU6R8U6U4H4M-1Ø,-4L4ND1ØM-3Ø,
-1ØNU16NE6D4M+3Ø,+1ØBL58ND8NH8"
7Ø5 DATA THIS FOOT HAS A SHOE *
71Ø DATA ON,OFF,LEFT,RIGHT
715 DATA"BR26BD2D14L2D4L2D4L2D4L
2D12F6R2ØE2R3ØF2R14E2F2R1ØE2U6H2
L1ØH2L8M-3Ø,-1ØH4U18BL18BD2ØG4D4
F4"
72Ø DATA THIS FOOT HAS A SHOE *
725 DATA OFF,ON,LEFT,RIGHT
73Ø DATA"BR2ØBD6ND2ØR8ØG1ØNL5ØM+
1Ø,+3ØG4L62H4M+1Ø,-3ØH4L8D14L6"
735 DATA THE PITCHER SHOWN IN *
74Ø DATA FULL,EMPTY,HOT,COLD
745 DATA"BR2ØBD6ND2ØR8ØG1ØM+1Ø,+
3ØG4L62H4M+1Ø,-3ØH4L8D14L6"
75Ø DATA THE PITCHER SHOWN IN *
755 DATA EMPTY,FULL,HOT,COLD
```

```
76Ø DATA"BR5ØBD14ND2ØR12D1ØNL12N
D1ØBR8R6NU6ND6R6BR1ØU18L6ØD36R6Ø
U18"
765 DATA THIS GRADE IS THE *
77Ø DATA BEST,WORST,LONGEST,SHOR
TEST
775 DATA"BR5ØBD14ND2ØR12BD1ØNL12
BR8R12BR1ØU18L6ØD36R6ØU18BD3Ø"
78Ø DATA THIS GRADE IS THE *
785 DATA WORST,BEST,LONGEST,SHOR
TEST
79Ø DATA"BR3ØBD4ND6R6ØD6NL6ØD4L6
ØNU4G4D28F4R6ØE4U28H4BL2ØBD32H4L
4U2NR4D2L4NUND4L4U2L4D2R4NH6L2G4
"
795 DATA THIS SHOWS A BUG * THE
JAR
8ØØ DATA INSIDE,OUTSIDE,OVER,UND
ER
8Ø5 DATA"BR12BD4ND6R6ØD6NL6ØD4L6
ØNU4G4D28F4R6ØE4U28H4BR36BD32H4L
4U2NR4D2L4NUND4L4U2L4D2R4NH6L2G4
"
81Ø DATA THIS SHOWS A BUG * THE
JAR
815 DATA OUTSIDE,INSIDE,OVER,UND
ER
82Ø DATA"BR16BD3ØNR3ØU2NR3ØU2R18
BR4R2BR4R2BL3ØU2R9ØG12M-48,+4U1Ø
"
825 DATA THIS CARVING KNIFE IS *
83Ø DATA SHARP,DULL,SOFT,HARD
835 DATA"BR16BD3ØNR4ØH2U4E2R4ØND
8R48F2D2G2L2G2L2G2L36H2"
84Ø DATA THIS BUTTER KNIFE IS *
845 DATA DULL,SHARP,SOFT,HARD
85Ø DATA"BR22BD6R3ØD6F4R8E4U6R3Ø
D16L8NU16L8D26L22NU3ØL22U26L8NU1
6L8U16"
855 DATA THIS NEW SHIRT IS *
86Ø DATA CLEAN,DIRTY,WET,HEAVY
865 DATA"BR22BD6R3ØD6F4R8E4U6R3Ø
D16L8NU16L8D26L8NU12L4NU2ØL2NU8L
4NU6L4NU3ØL8NU12L4NU2ØL2NU8L4NU6
L2NU18L2U26L8NU16L8U16"
87Ø DATA THIS OLD SHIRT IS VERY
*
875 DATA DIRTY,CLEAN,WET,HEAVY
88Ø DATA"BR2ØBD3ØNR84"
885 DATA THE SURFACE OF THIS LIN
E IS *
89Ø DATA SMOOTH,ROUGH,WET,DRY
895 DATA"BR14BD3ØBRE4R4F4R4E4R4F
4R4E4R4F4R4E4R4F4R4E4R4F4R4E4R4F
4"
9ØØ DATA THE SURFACE OF THIS LIN
E IS *
9Ø5 DATA SMOOTH,ROUGH,WET,DRY
91Ø DATA"BR24BD1ØR2ØF1ØL2ØNH1ØR6
ØM+2Ø,+8BL2ØNL6ØBR2ØM-2Ø,+8L6ØG1
ØR2ØE1ØL2ØU16BL8NL16BD4NL16BD4NL
16BD4NL16BD4NL16"
915 DATA THIS BIG ROCKET IS VERY
 *
92Ø DATA FAST,SLOW,THICK,DRY
925 DATA"BR42BD44NR3ØH1ØU1ØE1ØR2
ØF8D1ØG4L16H6U4E4R8F4D2G2L4H2BD8
R16E6R6NE6F4D4NL4G4L6BU8BR4R"
93Ø DATA THIS LITTLE SNAIL IS VE
RY *
935 DATA SLOW,FAST,THICK,DRY
94Ø DATA"BR32BD4R6ØD46L6ØU46BF2R
1ØNF4R18ND6R18NG4R1ØD5NG4D16NL6D
16NH4D5L1ØNH4L18NU6L18NE4L1ØU5NE
4U16NR6U16NF4U5BD23BR28F8U2H8NU2
M-18,-4"
945 DATA THE TIME SHOWN IS * THE
 HOUR
95Ø DATA BEFORE,AFTER,AROUND,UND
ER
955 DATA"BR32BD4R6ØD46L6ØU46BF2R
1ØNF4R18ND6R18NG4R1ØD5NG4D16NL6D
16NH4D5L1ØNH4L18NU6L18NE4L1ØU5NE
4U16NR6U16NF4U5BD23BR28F8U2H8NU2
M+18,-4"
96Ø DATA THE TIME SHOWN IS * THE
 HOUR
965 DATA AFTER,BEFORE,AROUND,UND
ER
```


VIP WRITER

# VIP Writer

**RATED "BEST" IN SEPT '88 "RAINBOW"**

VIP Writer has all the features of VIP Writer III described elsewhere in this magazine except the screen widths are 32, 51, 64 & 85. Screen colors are black, green and white, double clock speed is not supported, Spooler is unavailable. Hard disk is not supported. Even so, VIP Writer is the BEST word processor for the CoCo 1 & 2! VIP Writer includes VIP Speller AT NO ADDITIONAL COST. **DISK $69.95**

# VIP Database

**"ONE OF THE BEST" JULY 1984 "RAINBOW"**

VIP DATABASE

VIP Database has all the features of VIP Database III described elsewhere in this magazine except the screen widths are 51, 64 & 85. Screen colors are black, green and white, double clock speed is not supported, Spooler is unavailable. Even so, VIP Database is the most complete database for the CoCo 1 & 2! **DISK $49.95**

***Turn the page for more VIP software!***

```
97Ø DATA"BF3ØE8R2E2NH6R2E2R4E2NH
6R6E2R6NH6R4F2R6F2R4NH8F2R2F2R2F
8H2L2G2L2G2L4G2L6G2L2ØH2L6H2L4H2
L2H2NL2F2R2F2R4F2R6H4U2H2U4E2BR3
ØF2D4G2D2G4BU4BL1ØU8F2D4L4U6D8H2
U4"
975 DATA THIS EYE LOOKS LIKE IT
IS *
98Ø DATA AWAKE,ASLEEP,LISTENING,
TALKING
985 DATA"BF24BR4F2R2F2NG6R2F2R6F
2NG6F2R8NG6R8E2R6NG8E2R4E2R2E2R2
NG1ØE2BU2ØBL7ØR1ØG1ØR1ØBR6RBR6RB
R6NR1ØE1ØNL1ØBD1ØBR6RBR6RBR6NR1Ø
E1ØNL1ØBD1ØBR6RBR6R"
99Ø DATA THIS EYE LOOKS LIKE IT
IS *
995 DATA ASLEEP,AWAKE,LISTENING,
TALKING
1ØØØ DATA"BD6BF38R8E4U1ØR4U6L4U6
H4L16G4D6L4D6R4D1ØF4R8BU6NE4NH4B
U8NLNR2BU6BL4NR2BR6R2BR4ØBD2ØR8E
4U1ØR4U6L4U6H4L16G4D6L4D6R4D1ØF4
R8BU6NE4NH4BU8NLNR2BU6BL4NR2BR6R
2"
1ØØ5 DATA THIS PERSON IS * A FRI
END
1Ø1Ø DATA WITH,WITHOUT,HAPPY,SAD
1Ø15 DATA"BR6ØBD44R8E4U1ØR4U6L4U
6H4L16G4D6L4D6R4D1ØF4R8BU6NE4NH4
BU8NLNR2BU6BL4NR2BR6R2"
1Ø2Ø DATA THIS PERSON IS * A FRI
END
1Ø25 DATA WITH,WITHOUT,HAPPY,SAD
1Ø3Ø DATA"BR6ØBD5ØR8E4U1ØR4U6L4U
6H4L16G4D6L4D6R4D1ØF4R8BU6NE4NH4
BU8NLNR2BU6BL4NR2BR6R2BU12NL12R4
U2NL16U2NL3ØR14L2D8NF2NG2"
1Ø35 DATA THIS IS SOMEONE WHO IS
 VERY *
1Ø4Ø DATA WISE,FOOLISH,STRONG,WE
AK
1Ø45 DATA"BR6ØBD5ØR8E4U1ØR4U6L4U
6H4L16G4D6L4D6R4D1ØF4R8BU1ØNG4NF
4BU4NLNR2BU6BL4NR2BR6R2BU1ØR6M-1
Ø,-2ØM-1Ø,+2Ø"
1Ø5Ø DATA THIS IS SOMEONE WHO IS
 VERY *
1Ø55 DATA FOOLISH,WISE,STRONG,WE
AK
1Ø6Ø DATA"BRBD26BR24R76M-3Ø,-1ØL
4G4L4H4L4M-3Ø,+1ØD2M+3Ø,+6R4E2R8
F2R4M+3Ø,-6"
1Ø65 DATA THIS IS PART OF A * FA
CE
1Ø7Ø DATA PRETTY,UGLY,FAT,THIN
1Ø75 DATA"BD22BR2ØNE4NG4R76NH4NF
4G12L52H12F6R1ØNU6ND6R1ØNU6ND6R2
NU6R2NU6R2NU6R2NU6ND6R1ØNU6ND6R2
ND6R2ND6R2ND6R2ND6NU6R1ØNU6ND6R6
"
1Ø8Ø DATA THIS IS PART OF AN * F
ACE
1Ø85 DATA UGLY,PRETTY,FAT,THIN
1Ø9Ø DATA"BR16BD2ØR8ØM-4,+2ØL36M
-4,-18NL36E4R36H2L32R12U4R8D4BD4
2"
1Ø95 DATA THIS IS A PAN WHICH IS
 *
11ØØ DATA COVERED,UNCOVERED,HOT,
COLD
11Ø5 DATA"BR16BD2ØR8ØM-4,+2ØL36M
-4,-18NL36BU8BE4R36H2L32R12U4R8D
4"
111Ø DATA THIS IS A PAN WHICH IS
 *
1115 DATA UNCOVERED,COVERED,HOT,
COLD
112Ø DATA"BD2BR56F12D4G2L4D2F2D2
M-16,+4M+12,+3F2D2G4D4G2L14G2D4B
E2ØBR12NR26BD4M+2Ø,+6BU2ØM-2Ø,+6
BH18L4F2"
1125 DATA THIS SHOWS SOMEONE *
113Ø DATA TALKING,LISTENING,SEEI
NG,FEELING
1135 DATA"BD18BR94U4H4L4NU8L8G4D
2G2D12F2DF8R4ND6R6E4BH6L4H2U4BL2
8BD2ØE2R2E2U4E2U2ØH2U4H2L2H2BL12
BD34E2R2E2U4E2U1ØH2U4H2L2H2BL12B
D28E2R2E2U4E2U4H2U4H2L2H2BL12BD4
NF6D14L6F2L2"
114Ø DATA THIS SHOWS SOMEONE *
1145 DATA LISTENING,TALKING,SEEI
NG,FEELING
115Ø DATA"BR3ØBD8NE4NU8NH4BL8D1Ø
NR6ØD2ØNR6ØD1ØR6ØBR6F4H2G2E4BR6U
2ØNL6ØU2ØL6Ø"
1155 DATA THE MARK IS AT THE *
116Ø DATA START,FINISH,SIDE,MIDD
LE
1165 DATA"BR2ØBD8D1ØNR6ØD2ØNR6ØD
1ØR6ØBR6F4H2G2E4BR6U2ØNL6ØU2ØNL6
ØD4ØBR6NE4NR8NF4"
117Ø DATA THE MARK IS AT THE *
1175 DATA FINISH,START,SIDE,MIDD
LE
118Ø DATA"BR44BD4R6F4R2E4R2F4R2E
4R6G8L2ØNH8D4R2ØNU4F12D14G6L3ØH6
U14E12BF6BD4NR8L4D6R12D6L12R6ND4
NU16"
1185 DATA THIS MEANS SOMEONE IS
*
119Ø DATA RICH,POOR,TALL,SHORT
1195 DATA"BR58BD6R6F2R2F2R2F4R2F
4D4F2D6G2D4G4L2G4L2G2L2G2L12H2L2
H2L2H4L2H4U4H2U6E2U4E4R2E4R2E2R2
E2R4BD12BL2NG4D16L4R8BR8BU4U4R2L
6U4R6L2U4"
12ØØ DATA SOMEONE WITH JUST THIS
 IS *
12Ø5 DATA POOR,RICH,TALL,SHORT
121Ø DATA"BR36BD2ØR5ØD3ØL5ØU3ØBF
6ND16BR4ND16BR4ND16BR4ND16BR4ND1
6BR4ND16BR4D16BD4NL24BR8BU4R4U2L
```

```
4U2R4BU6L4U2R4U2L4BR32BU18M-14,+
6BL12NE8BL1ØNE8BL1ØNU8BL1ØNH8BL1
2NH8BL12M-14,-6"
1215 DATA THIS RADIO IS VERY *
122Ø DATA NOISY,QUIET,BRIGHT,DAR
K
1225 DATA"BD2BR36F12D4G2L4D2F2D2
G4NL1ØF2D2G4D4G2L14G2D4BR28U24E4
R2F4D1ØE2R2F2E2R2F2E2R2F2D1ØG4BU
2ØBL8R6U4L6U4R6BR6D8U4R8U4D8BR6U
8D4R8U4D8BR4R2BR4R2BU2ØBL8ØL6"
123Ø DATA THIS MEANS TO BE *
1235 DATA QUIET,NOISY,BRIGHT,DAR
K
124Ø DATA"BR4ØBD2R44F4D2M-8,+2ØG
8L4D4F4NL2ØD6L2ØU6E4U4L4H8M-8,-2
ØU2E4BD4BR2G2M+6,+16R2U18NL4BR28
D18R2M+6,-16H2L4BL22BD4NG2D16NL2
R2BR2BU6R4U4L4U4R4BR4R2ND8R2"
1245 DATA THIS IS A SIGN OF *
125Ø DATA WINNING,LOSING,SLEEPIN
G,READING
1255 DATA"BR34BD16R6U4L6U4R6BR4N
R6D8R6BR4U8R6D8NL6BR4U8R6D4L6R2F
4BR4NR6U4NR6U4R6BD2ØBL5ØD1ØR1ØU1
ØNL1ØBR6BD4R6BR1ØBD6R4NR4U1ØNG4B
R1ØD1ØR1ØU1ØL1ØBF18L74U44R74D44"
126Ø DATA THIS IS A SIGN OF *
1265 DATA LOSING,WINNING,SLEEPIN
G,READING
127Ø DATA"BR62BD36R8E4U1ØR4U6L4U
6H4L16G4D6L4D6R4D1ØF4R8BU1ØNG4NF
4BU4NLNR2BU6BL4NR2BR6R2BD1ØBF8M-
12,+18M-12,-18BU24BR38D3ØR4U3ØL4
U6R12D2R8F6D4L4H4L6U2L1ØBL5ØBD8L
22D2NR22R2D4F6G6D4L2NR22D2R22U2L
2U4H6E6U4"
1275 DATA THIS IS SOMEONE WHO IS
 *
128Ø DATA OLD,YOUNG,TALL,SHORT
1285 DATA"BR6ØBD44R8E4U8R4U6L4U6
H4L16G4D6L4D6R4D8F4R8BU6NE4NH4BU
8NLNR2BU6BL4NR2BR6R2BU8U2H2L4BR2
6BD6R1ØD2ØL1ØU2ØE2R6L2U2L2BL58BD
4L2G2D4F2R2D1ØG2D2F2E2U2H2U1ØR2E
2U4H2L2"
129Ø DATA THIS IS SOMEONE WHO IS
 *
1295 DATA YOUNG,OLD,TALL,SHORT
13ØØ DATA"BR18BD4R6ØD46L6ØU46BF2
R1ØNF4R18ND4R18NG4R1ØD5NG4D16NL6
D16NH4D5L1ØNH4L18NU6L18NE4L1ØU5N
E4U16NR6U16NF4U5BD23BR28F8U2H8NU
2U12BR4ØND8R12D4NL12D4BD8ND8G6H6
D8"
13Ø5 DATA THIS TIME IS VERY *
131Ø DATA EARLY,LATE,LONG,SHORT
1315 DATA"BR18BD4R6ØD46L6ØU46BF2
R1ØNF4R18ND4R18NG4R1ØD5NG4D16NL6
D16NH4D5L1ØNH4L18NU6L18NE4L1ØU5N
```


# MJK & MJK3 DOS

RAINBOW CERTIFICATION SEAL

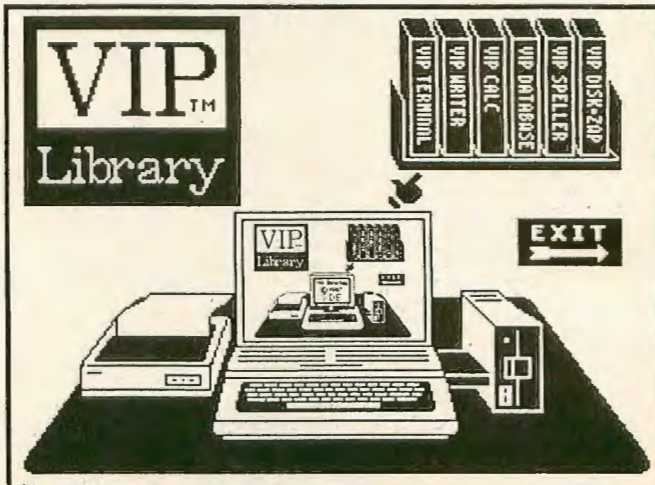
WHY BUY ADOS 3
WHEN YOU CAN HAVE THIS

New: MJK-DOS for COCO 1, 2, and 3 $39.95
Most powerfull operating system for the CoCo ever! Allows up to 3 DS-80 track drives or standard drives. The DS-80 drives are software configurable to standard Radio Shack* format in order to maintain compatibility. Allows global file name specification with wildcards. All the files will be displayed alphabetically, including the date that the file was saved. Use one command to KILL or COPY a number of files that meet the global filename specification (can be a full disk!) in one run or one at a time upon user prompt (Y-key). Use the powerfull CHAIN command to use programs of any length. Use the built in FULL SCREEN EDITOR to allow fast and easy program modification. You can even use the IRON command that will put you (after an error) in the modified line editor or get the automatic error trap routine with fully spelled out error names. Hit one key to repeat the last command. You will also get error trap, repeat key, AUTO, DATE, CAT (two columns of directory with only the filenames & extensions), WAIT, RUNM, BAUD, FIND, OLD, DATE$, (string in basic program), LCOPY (groups of basic lines), REPL (to replace a string), TYPE (list a text file on screen/printer), SPLIT or JOIN basic lines, SAY for real spoken text, word peek & poke and many more.... MJK-DOS is primarily intended for double-sided 80-track drives (720K each)
*ALLOWS YOU TO READ/WRITE/FORMAT 35/40 DISKS ON A 80T DRIVE*
******** EPROMABLE ****** **** FREE UPDATES FOR 1 YEAR ****

MJK512 DOS(COCO3-512K) $49.95
BUILT IN RAM DISK AND RAM TEST COMMANDS
Monitor-Disassembler (COCO 1, 2&3) $39.95
Source-Code Generator/LabelGenerator (COCO1,2&3) $49.95
JB REMOTE rs-232 pack driver for bbs etc. (COCO1,2,&3) $19.95
NEWKEY (COCO3) new key scan--gives you true ALT & CTRL $15.00
NEWKEY232(COCO3)--JB REMOTE and NEWKEY in one package $25.00
RTC -real time hardware clock for the coco 1,2,&3 $35.00

CALL OR WRITE (COD ORDERS OK)
COCO CONNECTION OF PHILA. PA.
5003 B ST.
PHILA., PA. 19120
PHONE: 215-457-1809 VOICE AND DATA
COMPUSERVE ID: 72317,437(LEAVE PHONE#)






The VIP Integrated Library combines all six popular VIP programs - VIP Writer*, Speller, Calc, Database*, Terminal and Disk-Zap - into one program on one disk. The program is called VIP Desktop. From the desktop you have instant access to word processing with a spelling checker always in attendance, data management with mail-merge, spread-sheet financial analysis, telecommunications and disk maintenance. Just move the hand to the volume on the bookshelf and the application is there. 64K req'd. $149.95

*CoCo 3 owners: See our FULL PAGE AD!*

## SD Enterprises

(503) 663-2865 P. O. BOX 1233. Gresham, OR. 97030
Please add $3 for shipping. COD orders add an additional $2.25. Personal checks allow 3 weeks for delivery. All other orders shipped the same day.

# CBASIC III EDITOR/COMPILER

**The ULTIMATE Color Computer III BASIC COMPILER!!!**

If you want to write fast efficient machine language programs and you don't want to spend the next few years trying to learn how to write them in Assembly language or with a cheap compiler, then CBASIC III is the answer!!!

CBASIC III is the only fully integrated Basic Compiler and Program Editing System available for the Color Computer 3. It will allow you to take full advantage of all the capabilities available in your CoCo-3 including 512K RAM, without having to spend years trying to learn assembly language programming. CBASIC III allows you to create, edit and convert programs from a language you are already familiar with Enhanced Disk Color Basic, into fast efficient machine language programs easily and quickly. CBASIC III supports all the enhanced hardware available in the CoCo-3, including Hi-Res Graphics, & Screen displays, Extended Memory and Interrupts (Keyboard, Timer, Serial & Clock). We even added advanced commands not available in Basic to give you a level of control only avialable to very advanced Machine Language Programmers. Plus we made it exceptionally easy to use, not like some other compilers. CBASIC III is the friendliest and easiest compiler available for the Color Computer III.

CBASIC III is a powerful tool for the Beginner as well as the Advanced Basic or Machine Language programmer. You can write programs without having to worry about the Stack, DP Register, memory allocations and so on, because CBASIC III will handle it for you automatically. For Advanced users, CBASIC III will let you control every aspect of your program, even generating machine code directly in a program easily.

CBASIC III features well over 150 Compiled Basic Commands and Functions that fully support Disk Sequential and Direct access files, Tape, Printer and Screen I/O. It supports ALL the High and Low Resolution Graphics, Sound, Play and String Operations available in Enhanced Color Basic, including Graphics H/GET, H/Put, H/Play and H/DRAW, all with 99.9% syntax compatibility. CBASIC III also supports the built in Serial I/O port with separate programmable printer & serial I/O baud rates. You can send and receive data with easy to use PRINT, INPUT, INKEY, GETCHAR and PUTCHAR commands.

CBASIC makes full use of the powerful and flexible GIMI chip in the Color Computer 3. It will fully utilize the 128K of RAM available and install 2 Ultra Fast Ramdisks if 512K is available, for program Creation, Editing and Compilation. You can easily access all 512K of memory in a Compiled program thru several extended memory commands that can access it in 32K or 8K blocks and single or double bytes.

CBASIC has its own completely integrated Basic Program Editor which allows you to load, edit or create programs for the compiler. It is a full featured editor designed specifically for writing Basic programs. It has block move and copy, program renumbering, automatic line number generation, screen editing, printer control and much more.

The documentation provided with CBASIC III is an 8 1/2 by 11 Spiral Bound book which contains approximatly 120 pages of real information. We went to great lengths to provide a manual that is not only easy to use and understand, but complete and comprehensive enough for even the most sophisticated user.

CBASIC III is the most expensive Color Basic Compiler on the market, and well worth the investment. You can buy a less expensive compiler for your CoCo-3, and then find out how difficult it is to use, or how limited its features are. Then you'll wish you had bought CBASIC III in the first place. Dollar for dollar, CBASIC III gives you more than any other compiler available. If you can find a better CoCo-3 Basic Compiler then buy it!!!

**Requires 128K & Disk $149.00**

# DATAPACK III PLUS V1.1

**SUPER SMART TERMINAL PROGRAM**

*AUTOPILOT & AUTO-LOG PROCESSORS*
*X-MODEM DIRECT DISK FILE TRANSFER*
*VT-100 & VT-52 TERMINAL EMULATION*

- No lost data even at 2400 Baud on the COCO-3 Serial I/O port.
- 8 Display Formats, 32/40/64/80 columns at 192 or 225 Res.
- 50K Text Buffer when using the Hi-Res Text Display & Disk.
- ASCII & BINARY disk file transfer support via XMODEM.
- Directly record receive data to a disk file (Data Logging).
- VT-100 terminal emulation for VAX, UNIX and other systems.
- VT-100/52 cursor keys, position, insert/delete, PF & Alt. keys.
- Programmable Word Length, Parity, Stop Bits and baud rates.
- Complete Full and Half Duplex operation, with no garbled data.
- 9 Variable length, Programmable Macro Key buffers.
- Programmable Printer rates from 110 to 9600 baud.
- Send Files directly from the Buffer, Macro Keys or Disk.
- Display on Screen or Print the contents of the Buffer.
- Freeze Display & Review information On Line with no data loss.
- Built in Command Menu (Help) Display.
- Built in 2 Drive Ramdisk for 512K RAM support and much more.

Supports: R.S. Modem-Pak & Deluxe RS-232 Pak, even with Disk.

**Requires 128K & Disk, $59.95**

# EDT/ASM III

**128/512K DISK EDITOR ASSEMBLER**

EDT/ASM III is a Disk based co-resident Text Editor & Assembler. It is designed to take advantage of the new features available in the CoCo-3 with either 128K or 512K of memory. It has 8 display formats from 32/40/64/80 columns by 24 lines in 192 or 225 Resolution, so you use the best display mode whether you are using an RGB or Composite monitor or even a TV for your display. Plus you can select any foreground or background colors or even monochrome display modes. It will even support 512K by adding an automatic 2 drive Ultra Fast Ramdisk for lightning fast assembly of program source code larger than memory. There is also a free standing ML Debug Monitor, to help you debug your assembled programs. EDT/ASM III has the most powerful, easy to use Text Editor available in any Editor/Assembler package for the Color Computer.

- Supports Local and Global string search and/or replace.
- Full Screen line editing with immediate line update.
- Easy to use Single keystroke editing commands.
- Load & Save standard ASCII formatted file formats.
- Block Move & Copy, Insert, Delete, Overtype.
- Create and Edit files larger than memory.

The Assembler portion of EDT/ASM III features include:

- Supports the full 6809 instruction set & cross assembles 6800 code.
- Supports Conditional IF/THEN/ELSE assembly.
- Supports Disk Library file (include) up to 9 levels deep.
- Supports standard Motorola assembler directives.
- Allows multiple values for FCB & FDB directives (unlike R.S. EDT/ASM)
- Allows assembly from the Editor Buffer, Disk or both.

**Requires 128K & Disk $59.95**

# TEXTPRO IV

**"The ADVANCED COCO-3 Word Processing System"**

- 9 Hi-Res Displays from 58 to 212 columns by 24 lines in 225 Res.
- On Screen Display of Bold, Italic, Underline & Double Width print.
- Up to 8 Proportional Character Sets Supported with Justification.
- Up to 80 Programmable Function Keys & Loadable Function key sets.
- Fully Buffered keyboard accepts data even duiring disk access.
- Autoexecute Startup files for easy printer & system configuration.
- 8 Pre-Defined Printer function commands & 10 Programmable ones.
- Supports Library files for unlimited printing & configurations.
- Disk file record access for Mail Merge & Boiler Plate printing.
- Completely Automatic Justification, Centering, Flush left & right.
- Change indents, margins, line length, etc. anytime in the text.
- Create and Edit files larger than memory, up to a full disk.
- Easily imbed any number of printer format and control codes.
- Built in Ultra Fast 2 drive RAMDISK for 512K support.

TEXTPRO IV is the most advanced word processing system available for the COCO-3, designed for speed, flexability and extensive document processing. It is not like most of the other word processing programs available for the Color Computer. If you are looking for a simple word processor to write letters or other short documents, and never expect to use multiple fonts or proportional spacing, then most likely you'll be better off with one of the other simpler word processors. But, if you want a powerful word processor with extensive document formatting features to handle large documents, term papers, manuals, complex formatting problems and letter writing, then TEXTPRO IV is what your looking for. It works in a totally different way than most word processing programs. It uses simple 2 character abbreviations of words or phrases for commands and formatting information that you imbed directly in your text. There are over 70 different formatting commands you can use without ever leaving the text your working on. There are no time comsuming, and often frustrating menu chases, you are in total control at all times. You can see what the formatted document will look like before a single word is ever printed on your printer. Including margins, headers, footers, page numbers, page breaks, column formatting, justification, and Bold, Italic, Underline, Double Width, Superscript and Subscript characters right on the screen.

TEXTPRO IV can even support LASER PRINTERS with proportional fonts, take a good look at this AD? It was done with TEXTPRO IV on an OKIDATA LASERLINE-6 laser printer!!! All the character sets used on this AD are proportional spaced characters, all centering, justification, and text printing was performed automatically by TEXTPRO IV.

**Requires 128K & Disk $89.95**

# HI-RES III Screen Commander

**The DISPLAY you wanted but didn't get on your CoCo-3**

- 54 Different Character Sizes available from 14 to 212 cpl.
- Bold, Italic, Underline, Subscript, Superscript and Plain character styles.
- Double Width, Double Height and Quad width characters.
- Scroll Protect form 1 to 23 lines on the screen.
- Mixed Text & Graphics in HSCREEN 3 mode.
- PRINT @ is available in all character sizes & styles.
- Programmable Automatic Key repeat for fast editing.
- Full Control Code Keyboard supported.
- Selectable Character & Background color.
- Uses only 4K of Extended (2nd 64K) or Basic RAM.
- Written in Ultra Fast Machine Language.

HI-RES III will improve the standard display capabilities of the Color Computer 3, even the 40 and 80 column displays have several features missing. For example, you can't use PRINT @ or have different character sizes on the same screen, even when mixing text and graphics with the HPRINT command. Hi-RES III can give you the kind of display you always dreamed about having on your CoCo-3, with a wide variety of display options that you can easily use with your Basic or ML programs.

HI-RES III is totally compatible with Enhanced Color Basic and its operation is invisible to Basic. It simply replaces the normal screen display with an extremely versatile display package. With the full control code keyboard, you can control many of HI-RES III extended functions with just a couple of simple keystrokes.

**Requires 128K Tape or Disk $34.95**

# 512K RAMDISK & MEMORY TESTER

RAMDISK is an ALL Machine Language program that will give you 2 ULTRA High Speed Ram Disks in you CoCo-3. It does not need or require the OS-9 operating system. It works with R.S. DOS V1.0 or V1.1 and it is completely compatible with Enhanced Color Disk Basic! Plus it allows your CoCo-3 to run at double speed all the time even for floppy disk access!!! It will not disappear when you press reset like some other ramdisk programs. The MEMORY tester is a fast ML program to test the 512K ram. It performs several bit tests as well as an address test so you know that your 512K of memory is working perfectly.

**Requires 512K & Disk $19.95**

# "The SOURCE III"

**DISASSEMBLER & SOURCE CODE GENERATOR**

The SOURCE III will allow you to easily Disassemble Color Computer machine language programs Directly from Disk and generate beautiful, Assembler compatible Source code.

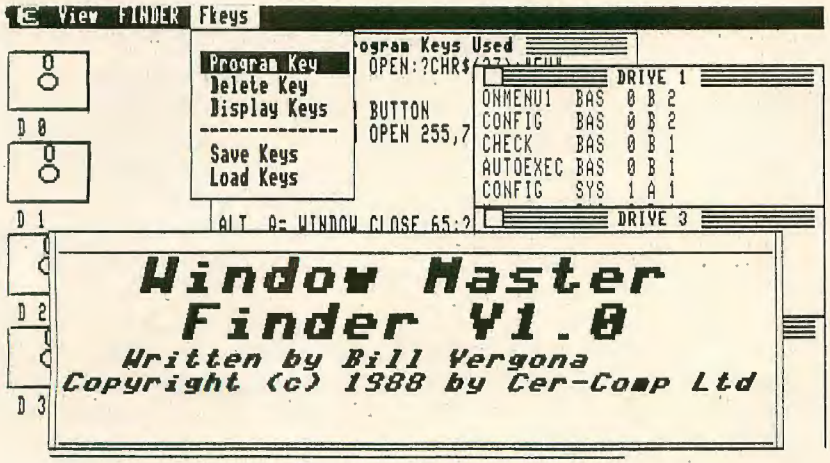
- Automatic label generation and allows specifying FCB, FDB and FCC areas.
- Disassemble programs Directly from disk, unlike other disassemblers.
- Automatically locates Begin, End and Execution address.
- Output Disassembled listing with labels to the Printer, Screen or both.
- Generates Assembler source files directly to disk or printer.
- Built in Hex/Ascii dump/display to locate FCB, FCC & FDB areas.
- 8 Selectable Display formats 32/40/64/80 columns in 192 or 225 Res.
- Selectable Foreground & Background colors & Printer Baud rates.
- Built in Disk Directory an Kill file commands.
- Menu display with single key commands for smooth, Easy operation.
- Written in Ultra Fast Machine Language.

**Requires 128K & Disk $49.95**

To order products by mail, send check or money order for the amount of purchase, plus $3.00 for shipping & handling to the address below.
To Order by VISA, MASTERCARD or COD call us at (702) 452-0632
(Monday thru Saturday, 8am to 5pm PST)

**CER-COMP LTD.**
5566 Ricochet Avenue
Las Vegas, Nevada 89110
(702) 452-0632

# "Window Master"




## Screen Display Fonts

Window Master supports up to 54 different character sizes on the screen with 5 different character styles. You can have Bold, Italic, Underlined, Super-Script, Sub-script or Plain character styles or any combination of them in any character size. You can also change the text color and background at any time to get really colorful displays.

## Fully Basic Compatible

Window Master is fully compatible with Enhanced Color Disk basic with over 50 Commands & functions added to fully support the Point & Click Window System. Window Master does not take any memory away from Basic, so you still have all the Basic Program memory available.

## Hi-Resolution Displays

Window Master uses the full potential of the Color Computer 3 display by using the 225 vertical resolution display modes instead of the 192 or 200 resolution modes like most other programs. It uses either the 320/16 color mode or the 640/4 color display to give you the best display resolution possible, and can be switched to either mode at any time.

## Mixed Text & Graphics

Window Master fully supports both Text & Graphics displays and even has a Graphics Pen that can be used with HLINE, HCIRCLE, HSET and more. You can change the Pen width & depth and turn it on or off with simple commands. We also added Enhanced Graphics Attributes that allow graphics statements to use And, Or, Xor and Copy modes to display graphic information. With the Graphics enhancements added by Window Master, you could write a "COCOMAX" type program in Basic! In fact we provide a small graphics demo program written in Basic.

## Event Processing

Window Master adds a powerful new programming feature to Basic that enables you to do "Real Time" Programming in Basic. It's called Event Trapping, and it allows a program to detect and respond to certain "events" as they occur. You can trap Dialog activity, Time passage, Menu Selections, Keyboard activity and Mouse Activity with simple On Gosub statements, and when the specified event occurs, program control is automatically routed to the event handling routine, just like a Basic Gosub. After servicing the event, the sub-routine executes a Return statement and the program resumes execution at the statement where the event occured.

## Enhanced Editing Features

Window Master adds an enhanced editor to Basic that allows you to see what you edit. It allows you to insert & delete by character or word, move left or right a word or character at a time, move to begin or end of line, toggle automatic insert on/off or just type over to replace characters. The editor can also recall the last line entered or edited with a single key stroke. You can even change the line number in line to copy it to a new location in the program.

# Window Master Features

## Multiple Windows

Window Master supports multiple window displays with up to a maximum of 31 windows on the screen. Overlapping windows are supported, and any window can be made active or brought to the top of the screen. Windows can be picked up and moved anywhere on the screen with the mouse. There are 6 different Window styles to choose from and the window text, border and background color is selectable.

## Pull Down Menus

Menus are completely programmable with up to 16 menus available. They can be added or deleted at any time in a program. Menu items can be enabled, disabled, checked or cleared easily under program control. Menu selection is automatically handled by Window Master & all you have to do is read a function variable to find out which menu was selected.

## Buttons, Icons & Edit Fields

Each Window can have up to 128 buttons, Icons or Edit fields active, if you can fit that many. Buttons, Icons and Edit field selection is handled automatically by Window Master when the mouse is clicked on one. All you have to do is read a Dialog function to find out which Button, Icon, or Edit field was selected, its very simple.

## Mouse & Keyboard Functions

Window Master automatically handles the Mouse pointer movement, display and button clicks. It will tell you the current screen coordinate, the local window coordinate, window number the mouse is in, the number of times the button was pressed, which window number it was clicked in and more. The Keyboard is completely buffered, and supports up to 80 programmable Function keys that can contain any kind of information or command sequences you can imagine. You can load and save function key sets at any time. So, you can have special sets of function keys for different tasks. The "Ctrl" key is supported so that you have a full control code keyboard available.

## Window Master Applications

Window Master pushs the Color Computer 3 far beyond its normal capabilities, into the world of a "User Friendly" operating enviornment. We are already planning several new programs for use with Window Master. So you don't have to worry about having to write all your own programs. And don't forget that many existing Basic and M.L. programs will run under Window Master with little or no changes. The Possibilities for Application programs are endless: Spread Sheets, Word Processing, Communications, Education, Games, Graphic Design, Desk Top Publishing and on and on.

## Hardware Requirements

Window Master requires 512K of memory, at least 1 Disk Drive, a Hi-Res Joystick Interface and a Mouse or Joystick.

## Technical Assistance

If you run into difficulty trying to use some of Window Master's features, we will be happy to assist you in any way possible. You can write to us at the address below or call us between 10am and 2pm Pacific Standard Time for a more timely response. Sorry, no collect calls will be accepted.

## Ordering Information

To order WINDOW MASTER by mail, send check or money order for $69.95, plus $3.00 for shipping & handling to the address below. To order by VISA, MASTERCARD or COD call us at (702)-452-0632
(Monday thru Saturday, 8am to 5pm PST)

**CER-COMP Ltd.**
5566 Ricochet Avenue
Las Vegas, Nevada 89110
(702)-452-0632

```
E4U16NR6U16NF4U5BD23BR28H8U2F8NU
2U12BR4ØND8R12D4NL12BD4BD8ND8G6H
6D8"
132Ø DATA THIS TIME IS VERY *
1325 DATA LATE,EARLY,LONG,SHORT
133Ø DATA"BR12BD4ØR1ØØL14BU2E2NR
6U2H2L2G2D2NF2L14NG2U2H2L2G2D2NF
2L1ØU4R4U2E6R2ØF4R1ØD8NR2BL54L4N
G2U2H2L2G2D2NF2L14NG2U2H2L2G2D2N
F2L1ØU2ØR28D6R6D6R8ND8BE22D8NE4N
H4"
1335 DATA YOUR CAR IS * THE TRUC
K
134Ø DATA IN FRONT OF,BEHIND,BES
IDE,UNDER
1345 DATA"BR12BD4ØR98L8BU4NG2U2H
2L2G2D2NF2L14NG2U2H2L2G2D2NF2L1Ø
U2ØR28D6R6D6R8D8L4BL56BD2E2NR6U2
H2L2G2D2NF2L14NG2U2H2L2G2D2NF2L1
ØU4R4U2E6R2ØF4R1ØD8NR2BH22NU8NH4
NE4"
135Ø DATA YOUR CAR IS * THE TRUC
K
1355 DATA BEHIND,IN FRONT OF,BES
IDE,UNDER
136Ø DATA"BR12BD4ØR1ØØL64BU2E2NR
6U2H2L2G2D2NF2L14NG2U2H2L2G2D2NF
2L1ØU4R4U2E6R2ØF4R1ØD8R2BD4R8U24
NG4U4NR44L8E12NR4ØBG16BL12NL14NH
4NG4"
1365 DATA THE CAR WILL * THE GAR
AGE
137Ø DATA ENTER,EXIT,SURROUND,HI
T
1375 DATA"BR12BD4ØR1ØØL14BU2E2NR
6U2H2L2G2D2NF2L14NG2U2H2L2G2D2NF
2L1ØU4R4U2E6R2ØF4R1ØD8NR2BD4L52U
24NF4U4NL44R8H12NL4ØBF16BR12R14N
H4NG4"
138Ø DATA WATCH THE CAR * THE GA
RAGE
1385 DATA EXIT,ENTER,SURROUND,HI
T
139Ø DATA"BR3ØBD24ND1ØF1ØM+28,-8
R1ØF1ØG4NL1ØG6L1ØM-28,-8G1ØU1ØU2
BR36NH4NG4BR1ØBU4R2BR12R2BU6R2BU
6R2BU6R2BU1ØBR4NF4G4L8H4G4L8H4G4
L8H4G4L8H4G4L8H4G4"
1395 DATA THIS FISH IS *
14ØØ DATA ALIVE,DEAD,TASTY,AWFUL
14Ø5 DATA"BR3ØBD24ND2ØF1ØNG1ØR6N
U4ND4R6NU6ND6R6NU8ND8R6NU8ND8R6N
U8ND8R6ND8U8R4F8G4NL4G4L4BU22BL1
ØE2U2H2U2E2U2H2U2BL12D2F2D2G2D2F
2D2G2"
141Ø DATA THIS FISH IS *
1415 DATA DEAD,ALIVE,TASTY,AWFUL
142Ø DATA"BR34BD34NU8R6NU8R6NU8B
R6U8R8D4NL8D4BR6NU8R8BR6U8D4R4NE
4F4BR6ND4U12L68D16NR68U18R68U2L6
8U2R68U2L68U2R68U2L68U2R68U2NL68
L28NU6L1ØNU6BD32ND6BR1ØND6"
1425 DATA THIS SIGN TELLS YOU TO
 *
143Ø DATA GO,STOP,LISTEN,TALK
1435 DATA"BR34BD34NU8R6NU8R6NU8B
R6U8R8D4NL8D4BR6NU8R8BR6U8D4R4NE
4F4BR6ND4U12L68D16NR68U32R68ND32
L28NU6L1ØNU6BD32ND6BR1ØND6BU2ØBL
34R2NU8R8U8NL1ØBR6ND8R8D8NL8BR6U
8F8U8BR6R2ND2BR4R4ND8R4"
144Ø DATA THIS SIGN TELLS YOU TO
 *
1445 DATA STOP,GO,LISTEN,TALK
145Ø DATA"BR22BD16NR68M+4,+1ØF16
G6R4ØH6E16M+4,-1ØBD1ØBR6R1ØF4D6G
1ØM-1Ø,+3L1ØE6R1ØE6U2H2L4U4BU1ØB
L3ØG6D4NF4G8"
1455 DATA THIS CUP IS *
146Ø DATA BROKEN,FIXED,HEAVY,LIG
HT
1465 DATA"BR22BD16NR68M+4,+1ØF16
G6R4ØH6E16M+4,-1ØR1ØF4D6G1ØM-1Ø,
+3L1ØE6R1ØE6U2H2L4"
147Ø DATA THIS CUP IS *
1475 DATA FIXED,BROKEN,HEAVY,LIG
HT
148Ø DATA"BR3ØBD42R5ØE4U6M-6,-16
E2U4H4L12G2D6F2R4NE2D1ØH2L2H2L4H
2L6G2L4G2L2G2L4BU1ØR12U2L12U2R12
NR16U2NR16L12U2R12U2L12BR6ØR12D2
L12D2NL16R12D2L12NL16D2R12D2L12"
1485 DATA THIS SHOWS A * ARM
149Ø DATA STRONG,WEAK,HEAVY,LIGH
T
1495 DATA"BR3ØBD42R12D2R1ØD2R6U2
R1ØU2R12E4U6M-6,-16E2U4H4L12G2D6
F2R4NE2D12L34BU16NR26NU4ND2U2R26
BR22R22NU2ND4D2L22"
15ØØ DATA THIS SHOWS A * ARM
15Ø5 DATA WEAK,STRONG,HEAVY,LIGH
T
151Ø CLS:PRINT@1Ø1,"YOU TRIED"NC
+NW"TIMES &":PRINT@165,"ANSWERED
"NC"CORRECTLY"
1515 PRINT@229,"WHILE DOING"NW"W
RONG."
152Ø NQ=NC+NW:IF NQ=ØTHEN NQ=1
1525 MS=INT(NC/NQ*1ØØ)
153Ø PRINT@293,"YOUR SCORE IS"MS
"%."
1535 PRINT@357,"ANOTHER TRY (Y/N
/C) ?";
154Ø X$=INKEY$:IFX$="Y"THEN RUN
1545 IFX$="N"THENCLS:END
155Ø IFX$="C"THEN156Ø
1555 GOTO154Ø
156Ø IF FF=1 THEN RUN
1565 IFV=1THENSCREEN1,1:GOTO29Ø
157Ø IFV=ØTHENSCREEN1,1:GOTO245
```

*Finally, a beginner's project that does something*

# A Simple, Expandable LED Project

**By Tony DiStefano**
**Rainbow Contributing Editor**

Ever notice that my articles run in patterns? Usually, I start with a simple project for the beginner, move on to a harder, longer project and then finish with an electronic lesson. Well, it's time, once again, for a beginner's project. It is always hard to design a simple project that actually does something. As an electronics student in college, I did a lot of labs. They were simple, but they were *boring*. (Set the power supply to 10 volts. Put two resistors in series. Measure the voltage across the two resistors. Compare the values to that of the calculated voltage values.) Those labs were enough to put you to sleep in the middle of a lab.

For this column, I had to design a project that is simple but not boring. I checked to see what beginners wanted as a starter project. Most said they wanted something that worked in front of them — something that buzzed, beeped, moved or lit up. In the past, I have had projects using an LED to indicate that power is on, the disk drive is on, etc. LEDs are always a good project, and this beginner's project makes the computer control up to eight LEDs. (Note: Even though this project is for beginners, some electronics knowledge is required. Read the article and judge for yourself if you understand enough of it to try it.)

I will continue this project for a few months and make it grow into a miniature control center. This project will show the beginner how to turn on LEDs, small motors, relays, sensor devices, etc. If you come up with a few ideas, let me know. You can write to me in care of THE RAINBOW or reach me on Delphi.

As with any project, you need tools. How far you want to go with this project will determine how many tools and parts you will need. To begin the project, you will need the following parts:

| Part # | Description |
|---|---|
| U1 | 74LS273 |
| C1 | .1uf 10 volts |
| R1 to R8 | 470 ohm ¼ watt |
| D1 to D8 | LED (just about any kind) |
| Misc.: | 20-pin socket and wire. |

You may already have some of these materials, and most are available at your local Radio Shack. You may need to get some parts through a mail order service. Many companies that have the parts advertise in RAINBOW.

The first thing you need is a project board. Radio Shack has dropped this item. I suggest you check RAINBOW's advertisements to find a board. I get my boards through CRC, but the board is available through other companies. At this time, the only tools you will need are a soldering iron and some solder.

It should take less than two hours to assemble this project. We will do it together, step by step. Don't start until you have all the parts. It's no fun to let a project sit, incomplete, because some of the parts are missing.

Before we begin, it is important to

*Tony DiStefano is a well-known early specialist in computer hardware projects. He lives in Laval Ouest, Quebec. Tony's username on Delphi is DISTO.*

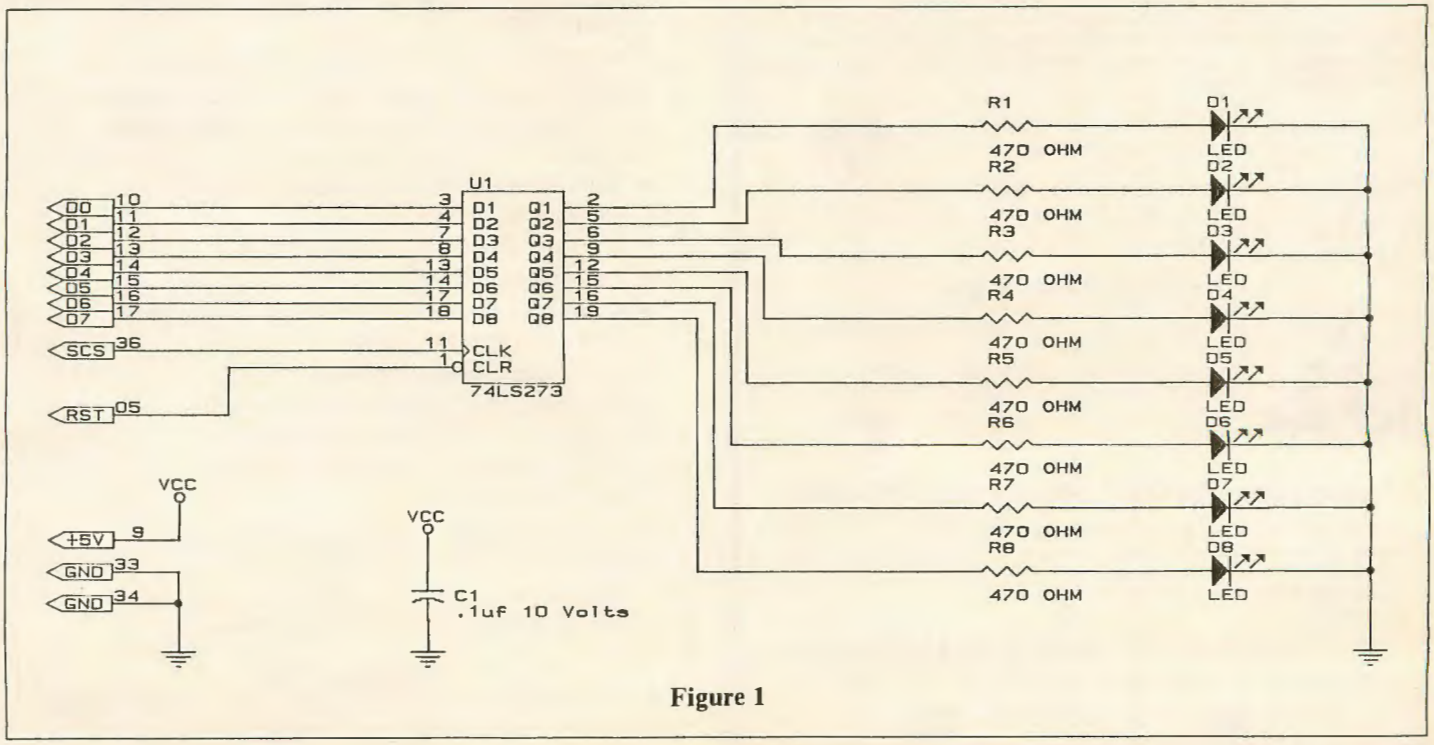



**Figure 1**

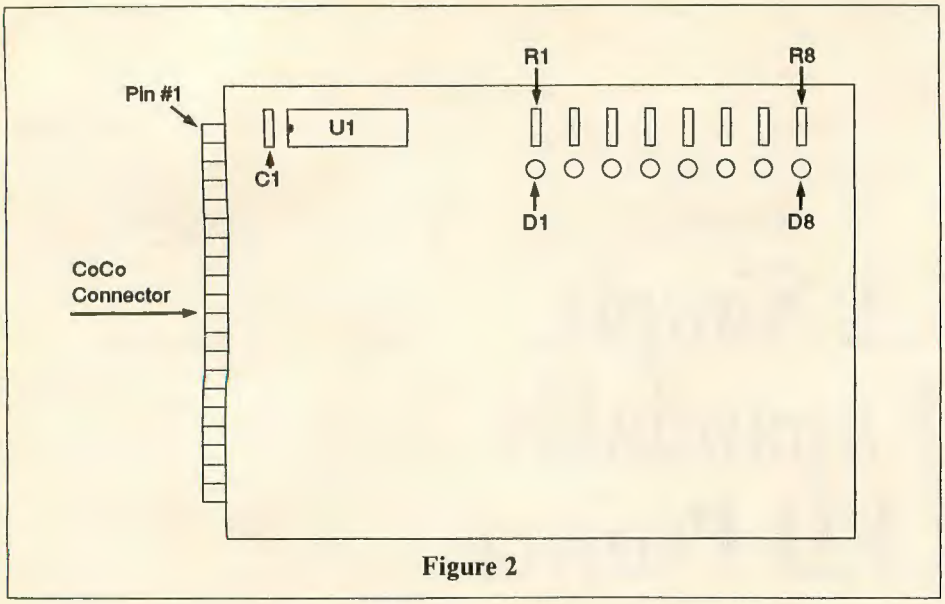



Figure 2

understand how a schematic diagram works. Look at Figure 1, and examine U1. The pin numbers are not drawn in any order. They are arranged so the diagram is easy to understand. All the inputs are one side, and all the outputs are on the other.

On the actual board, the pins are arranged in order. Begin with Pin 1, which is identified by a notch or dimple. The next pin in a counter-clockwise direction is Pin 2. The other pins are in the same counter-clockwise order. The boxes on the left of Figure 1 are the pin descriptions for the CoCo's pin connector. The numbers above the wires are the pin numbers. Pin +5V leads to a box labeled VCC. That means every point in the diagram hooked up to VCC is really hooked up to that pin. This also applies to Box GND. All points marked GND are connected.

While it is not obvious on this small diagram, the way the diagram is presented makes the schematic easier to read. Instead of wires everywhere, labels are used. (Please note: Though not marked on the diagram, U1 has a VCC at Pin 20 and a GND at Pin 10.

Now, let us begin the project.

First, put all the parts on a clean table. If you are using a CRC project board, make sure you have the right side up. A small #1 is printed next to Pin 1. This is the top. Pin 2 is directly below Pin 1. Pin 3 is next to Pin 1, Pin 4 is below Pin 3 and next to Pin 2, etc. All parts will mount on the top.

Mount the 20-pin socket in the top of the protoboard. For proper placement, follow the plan in Figure 2. Make sure that Pin 1 is the pin closest to the edge connectors. Solder all the pins of the socket, and mount the resistors and LEDs. Make sure that the short lead of the LED is positioned away from the resistors. They are polarized, and the short lead is the negative side. Bend the leads so that no part falls out. Insert the capacitor next to the socket, and bend the leads of this part as well.


**INTRODUCING THE WARGAME DESIGNER**

TAKE COMMAND! Now you can create your own 1 & 2 player wargames and more. If you are into wargames, science fiction or Dungeons and dragons, you'll love the WGD system.
The completely menu driven system allows you to create your own full color Hi-res icons for units and map features. Take control of the number of units, strength, movement, turn of entry, range of fire, terrain modifiers and objectives. No programming required!
WGD comes with a 23 page manual and 2 flippy diskettes in a rigid vinyl case with these four ready to play scenarios:

| | |
|---|---|
| INVASION NORTH | a river crossing challenge |
| ATTACK ON MOSCOW | a historic simulation 1941 |
| ROBOT COMMAND | a si-fi thriller |
| DUNGEON WARRIOR | save the damsel in distress |

RAINBOW CERTIFICATION SEAL

Complete WGD system ONLY $29.00 Each scenario available separately with WGD system demo for ONLY $10.00.
COCO 3 128K Disk

**GRIDIRON STRATEGY**

The FIRST and still the BEST 2 player football strategy game for the COCO 3 128K disk.
Over 20 offensive plays and 10 defensive allignments. See the RAINBOW review 8/87. '..fascinating.' Totally unique playing system!
Disk, manual and playing aids only $21.00.

RAINBOW CERTIFICATION SEAL

**$$$$$$$$$$ WEEKLY WINNER 2.0 $$$$$$$$$$**

A graphics oriented PROVEN WINNER! Features statistical analysis, intuition and luck. Manual contains little known facts about winning number characteristics. Works with all state lotteries. all number combinations.
*'I won $90.00 the first time I used it.'* KJO, OH
ONLY $10.00

Orders shipped first class FREE within 24 hrs. of receipt.

**SPORTSware 1251 S. Reynolds Rd., Suite 414, Toledo, OH 43615**

MasterCard **(419) 389-1515** VISA



**BOWLING LEAGUE SECRETARY** ©1986

RAINBOW CERTIFICATION SEAL

Reviewed Sept. 1986 pg 141 — April 1987 pg 140

**Now for the Co-Co 1, 2 or 3 with disc drive, printer, 32K.**

- User friendly—full menu driven selections.
- Any number of teams, and over 200 bowlers.
- Calculates and stores all team and bowlers stats.
- Men, women, mixed, scratch or handicap; blinds and substitutes.
- Start up any time in season.
- Full edit capability.
- Automatic backups and weekly, mid-season and end-season resets.
- ABC/WIBC style printouts.
- Includes 20-page instruction manual.
- Upgrade for individual tally sheets. ($9.95 separate; free when ordered with program.)

Priced at **$49.95** including Shipping, Handling & Sales Tax. To order, send check or M.O.

Specify Version number (1.0 for men or women; 1.1 for mixed) and number of disc drives.

**TOMELA*CO**

**P.O. Box 2162 • Doylestown, Pa. 18901-2162 • (215) 348-5822**

The rest is just wiring. You know the pin numbers and positions. One at a time, solder a wire between the points in the schematic. Every time you place a wire, mark it off on the diagram. This serves two purposes: that you don't miss any points and that you don't try to do any point twice.

Let's do the first few together. Following the schematic, solder one end of the wire to Pin 10 on the connector. Cut the wire so that it just reaches Pin 3 of U1, and solder that end of the wire to Pin 3 of U1. Mark off this wire on the schematic. Next, solder an end of the wire to Pin 11 of the connector. Cut the wire so that it just reaches Pin 4 of U1, and solder that end to Pin 4. Mark off that wire on the schematic. Now finish off the rest of the wires one at a time. When you are finished, recheck all your work. Remember to check the VCC and GND of U1. Insert the 74LS273 into the socket, and make sure that Pin #1 is in the right place.

That's all there is to the hardware part of it. Plug it in, turn on your computer and check for the normal power-up message. If you do not, turn off the computer and check your work again.

Now that you have built it, let's see how it works. Look at Figure 1. The main part in this project is U1, an eight-bit D-type flip-flop. All the D's are inputs and all the Q's are outputs. When the CLK input is strobed, the binary level on D is transferred to Q. Thus, if all D's were at Level 1 when the CLK was strobed, all the Q's (outputs) are now at Level 1. The D's are now at Level 0. The CLK that I am using is the CoCo's SCS pin. It is mapped at $FF40 to $FF5F. Since I am not using any address lines, mirroring will occur throughout this area. Next month, when we expand, I'll use the address lines to add more to this project.

Since they are all connected to identical circuits when any Q has 0 volts, no current can flow because the other end of the circuit also has 0 volts (GND). The LED is off. When any Q is high, roughly three to five volts, current flows through the resistor and the LED.

Since each LED is represented by one bit on the CoCo's bus, D0 on the CoCo controls LED 1, D1 controls LED 2, etc. Since it is memory-mapped on the CoCo's bus, a simple BASIC poke command will turn on the LEDs. Thus, if you type `POKE &HFF40, 255`, all the LEDs should go on. (Wow! It works.)

If it doesn't work, check all your wiring. Did you put all the LEDs in the right direction? Try reversing one and see.

If it is working, continue by typing `POKE &HFF40, 1`. Only one LED should be on. Now try typing 2 instead of 1, then 4, 8, 16, 32, 64 and finally 128. Each LED should light up, one at a time. Now try 72 (8 + 64). Adding two LED values together will cause both LEDs to come on. Use a `FOR/NEXT` loop to write a program that makes a chaser.

Those of you with Multi-Pak Interfaces must remember that the SCS pin is switched. In order to poke the values at $FF40 in the right slot, you must change the slot access. You can do this by going into the all-RAM mode and turning the switch in front of the Multi-Pak to the project's slot. You can also make sure that your disk controller is in Slot 4, then put your project in Slot 1 and type `POKE &HFF7F, &H30`. This will change the SCS access to Slot 1 and leave the CTS, or DOS, access in Slot 4. Remember to return to &H33 before trying to access the disk.

In my next column, I'll expand this project to include more goodies that beep, boop and buzz.


CINSOFT
PROGRAMS • PERIPHERALS • SUPPLIES • SERVICE

Fast Delivery...
Friendly Service

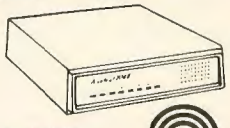
Now in our 6th year!

Avatex Modems

* NEW LOW PRICES *

Avatex 1200e $ 89
with Coco Cable 99

Avatex 2400 $199
with Coco Cable (Coco 3 only) 209
with RS-232 Cable* 225



Reviewed in this month's Rainbow!

Avatex 1200e, Cable AUTOTERM ... $129

Avatex 2400, Cable AUTOTERM ... $239

*Coco 1, 2 requires Deluxe RS-232 Pak

• Call • 513-396-SOFT

• Shop by Modem • 513-396-SHOP

VISA MasterCard AMERICAN EXPRESS

2235 Losantiville, Cincinnati, OH 45237
SHIPPING will be charged at our ACTUAL COST
Ohio residents add 5.5% Sales Tax COD add 2.50



Armchair Admiral

"Avast ye swabbies!" Roars Captain Blackbeard. "Hoist the Jolly Roger! When I gives the word, give 'em a broadside!" As Blackbeard's flotilla closes upon it's prey, a lookout suddenly cries, "Captain, a British Man-of-War!"

The time-honored parlor game of Battleship, enhanced by intelligent computer opponents, comes to your Coco3 complete with sloops and galleons. Up to eight opponents, any mix of human or computer. Available for the Coco3 with 80 column display and one disk drive. $14.95 + $2 S&H. WA residents please add 7.6% sales tax.

**Order from: Eversoft**
**P.O. Box 3354**
**Arlington, Wa 98223-3354**
**(206) 653-5263**
**10 a.m. to 6p.m. PST**

Personal check, money orders, and COD orders welcome.
GEnie mailbox: EVERSOFT

Barden's Buffer

16K ECB

# Sorting It All Out

**By William Barden, Jr.**
**Rainbow Contributing Editor**

You wouldn't think sorting would be such a big deal on computers, would you? Alphabetizing a mailing list, arranging shapes in order of size, building an ordered word list — it just doesn't seem like a profound task. And yet, I'm sitting here with Knuth's *Sorting and Searching*, a 700-page book with fine print that discusses the various sorting methods. Although Knuth is a renowned computer expert, he doesn't write for the popular audience. (In fact, I haven't seen *many* descriptions of sorts that even an experienced programmer would understand.)

This column will attempt to describe four typical sorts so that average RAINBOW readers (*and* the author) can understand them. Fortunately, we can use CoCo graphics to our advantage in this situation. The programs I'm about to describe not only *sort* data, but they *display* the data on the CoCo screen as it is sorted. I was amazed to see just how easily the sorts can be visualized if you can, well, *visualize* them.

### A Row of 126 Sticks

Suppose that you have a row of 126 sticks of various sizes; some of the sticks may be the same size. How do you sort them? One way is to bundle them up, stand them on a flat surface, and pick the longest stick. This stick is then set aside, and the process is repeated for the next stick, and the next, etc. The process continues for all 126 sticks — 126 selections are made.

A computer sort can proceed the same way. However, the computer can't *see* all 126 sticks and pick out the longest. It must scan through all 126 sticks, and compare each new stick with one previously set aside as the longest. It's as if a friend were holding the sticks behind his back and handing them to you one at a time. You'd compare the new stick with the longest stick you had found so far, and save the new stick if it was longer.

### A Selection Sort

The Selection Sort is similar to the case of the friend holding sticks behind his back. At the end of one pass through the sticks, the Selection Sort selects the longest stick. Let's see how it works.

Suppose that you have the 10 sticks shown in Figure 1 and want to place them in order, smallest to largest, left to right. First, assume that we have a pad and pencil on which we've noted the "largest stick" and its position — one through 10. We'll begin with an imaginary stick *smaller* than any in the pile and place it in Position -1. We will also note on the pad the last position of the row — Position 10. Moving from left to right, we will look at each new stick. If it's larger than the largest stick we've recorded, we make a note of its position. As we continue moving to the right, we compare each stick to the largest stick we have found. If a new stick is larger, *it* becomes the largest stick, and its position is noted on the pad. At the end of one pass, we have the position of the largest stick. We now exchange that stick with the stick in the last position. Position 10 now holds the largest stick.

Next, we use Position 9 as the last position and start the process again — examining the sticks in positions one through nine. At the end of this scan we have the position of the next largest stick, and we exchange this stick with the one in Position 9. Then we begin the process again, using Position 8 as the last position. Next we use Position 7, etc. Each time we complete the process, we add the next largest stick to the last position. It takes 10 passes to order the sticks from largest to smallest, left to right.

---

*Bill Barden has written 27 books and over 100 magazine articles on various computer topics. His 20 years' experience in the industry covers a wide background: programming, systems analysis and managing projects for computers ranging from mainframes to micros.*

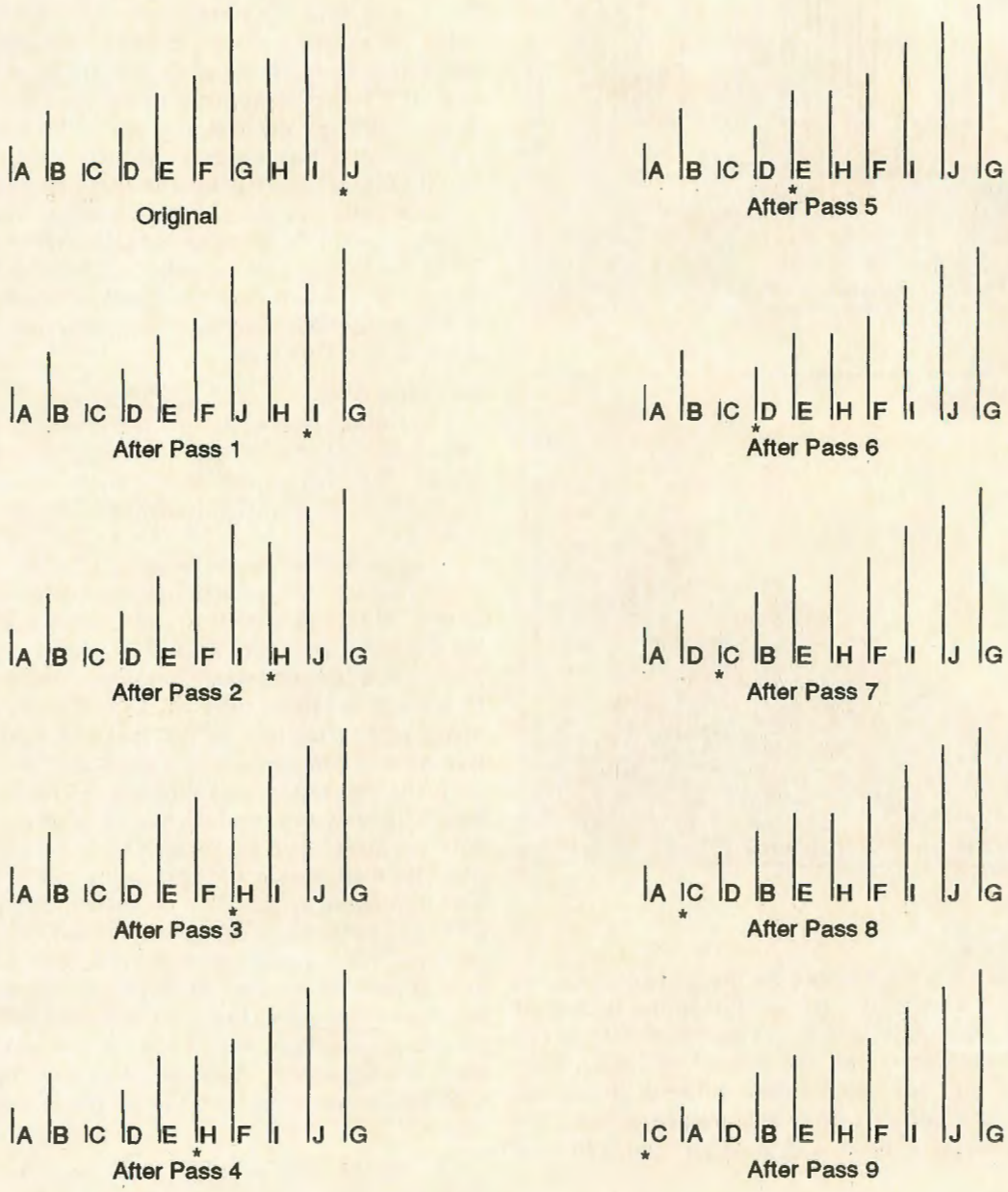



**Figure 1: Selection Sort**

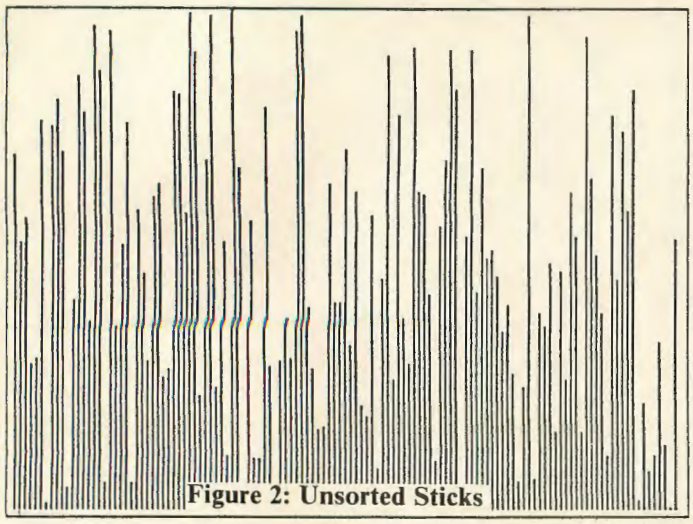


Figure 2: Unsorted Sticks

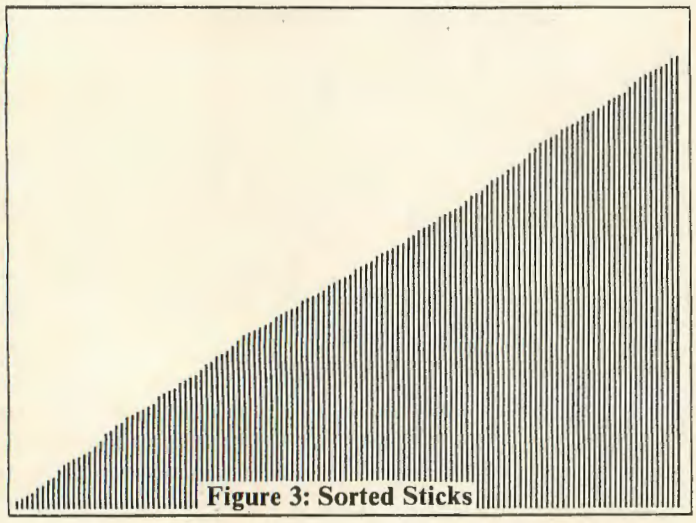


Figure 3: Sorted Sticks

### A Screen Full of Sticks

We've simulated a pile of sticks on the CoCo screen, as shown in Figure 2. The BASIC LINE command has been used to generate 126 randomly-sized sticks across a 256-by-192 resolution screen. The sticks are placed in alternating columns so that you can differentiate between individual sticks and so that a border can be maintained around the screen. (We could have used any number, but 126 was convenient.)

The lengths of the sticks are stored in Array NO, a 126-entry numeric array. The values in NO correspond to the length of each stick.

### Selection Sort Mechanics

The *Selection Sort* program is shown in Listing 1. The first portion generates the sticks on the screen; the middle portion is the actual sort; and the last portion displays the swapped sticks.

In the program, Variable J is the position of the last stick. It begins as Position 126 and ends as Position 1. Imagine this position changing as smaller and smaller sticks move from the rightmost to the leftmost position. As the pass progresses, Variable LS, will hold the value of the largest stick. The initial value of LS is -1. Because every stick is larger than this, it's guaranteed that there will be a new largest stick at the end of the first pass. Variable SI records the current position of the largest stick. Its initial value is also -1, an illegal value, but this will be changed to a legitimate value by the end of the first pass.

The main loop in the sort is Line 220. The stick lengths from NO(1) through NO(J) are compared to the largest stick in LS. Any stick larger than the value in LS replaces the LS value. Its position is then stored in Variable SI. At the end of the pass, SI holds the position of the largest stick — NO(I). This stick is then swapped with NO(J). The process continues as the value of J decreases by one with each pass.

(After each pass, the two line display subroutines clear the two stick lines involved and then rewrite the exchanged lines.)

Keep your eye on the largest stick while running this program. It will be swapped with the stick in the last position. You'll see progressively smaller sticks being placed from left to right as the sort is done. The result of this sort is shown in Figure 3. The *Selection Sort* program takes about 1½ minutes on a CoCo 2.

### Bubbling Away

The Bubble Sort is another popular sort. It's similar to the Selection Sort. At the end of one pass through the sticks, the Bubble Sort selects the longest stick. However, it may also exchange other sticks, partially ordering them. Let's see how it works.

Imagine that we have the same 10 sticks shown in Figure 1 and that we still want to order the sticks from smallest to largest. Moving from left to right, we look at a pair of sticks. We first compare sticks 1 and 2. If Stick 1 is larger than Stick 2, the sticks are swapped. Next we compare sticks 2 and 3. If Stick 2 is larger than Stick 3, the sticks are swapped. Moving down the line, we will make nine comparisons — the last one is a comparison of sticks 9 and 10.

At the end of the pass through the 10 sticks, what do we have? Since we swapped sticks each time the first stick in the pair was larger than the second, we find that the largest stick has "bubbled" down the line to the last position, Stick 10. The remaining sticks may be sorted, but probably aren't, although some sticks have been moved toward their correct position. We can now repeat the procedure for the remaining nine sticks. At the end of this pass, the next largest stick occupies Position 9. Eight more passes will guarantee that all sticks have been sorted. Of course, when no swaps are made during a pass, then the sticks have been sorted, even if 10 passes have not been made. The first pass is shown in Figure 4.

The *Bubble Sort* program is shown in Listing 2. Like the *Selection Sort* program, the screen is first filled with 126 sticks. The middle portion is the actual Bubble Sort. The last portion displays the swapped sticks and is similar to the line display subroutines in Listing 1.

If you run this program you'll see the swapping taking place as a dark line that moves across the screen. Each time the dark line appears, two adjacent sticks are being swapped. As the sort progresses, longer sticks build up on the screen right, one stick being added for each pass through the sticks. As the screen becomes sorted, you'll see fewer and fewer swaps being made.

The sort portion of the program uses two variables. Variable J always points to the last entry in the list. J starts at 126, the last screen line, but decreases by one for each pass. Variable I is the current location of the stick as a pass is made from Stick 1 to Stick J. Swaps are made by swapping stick

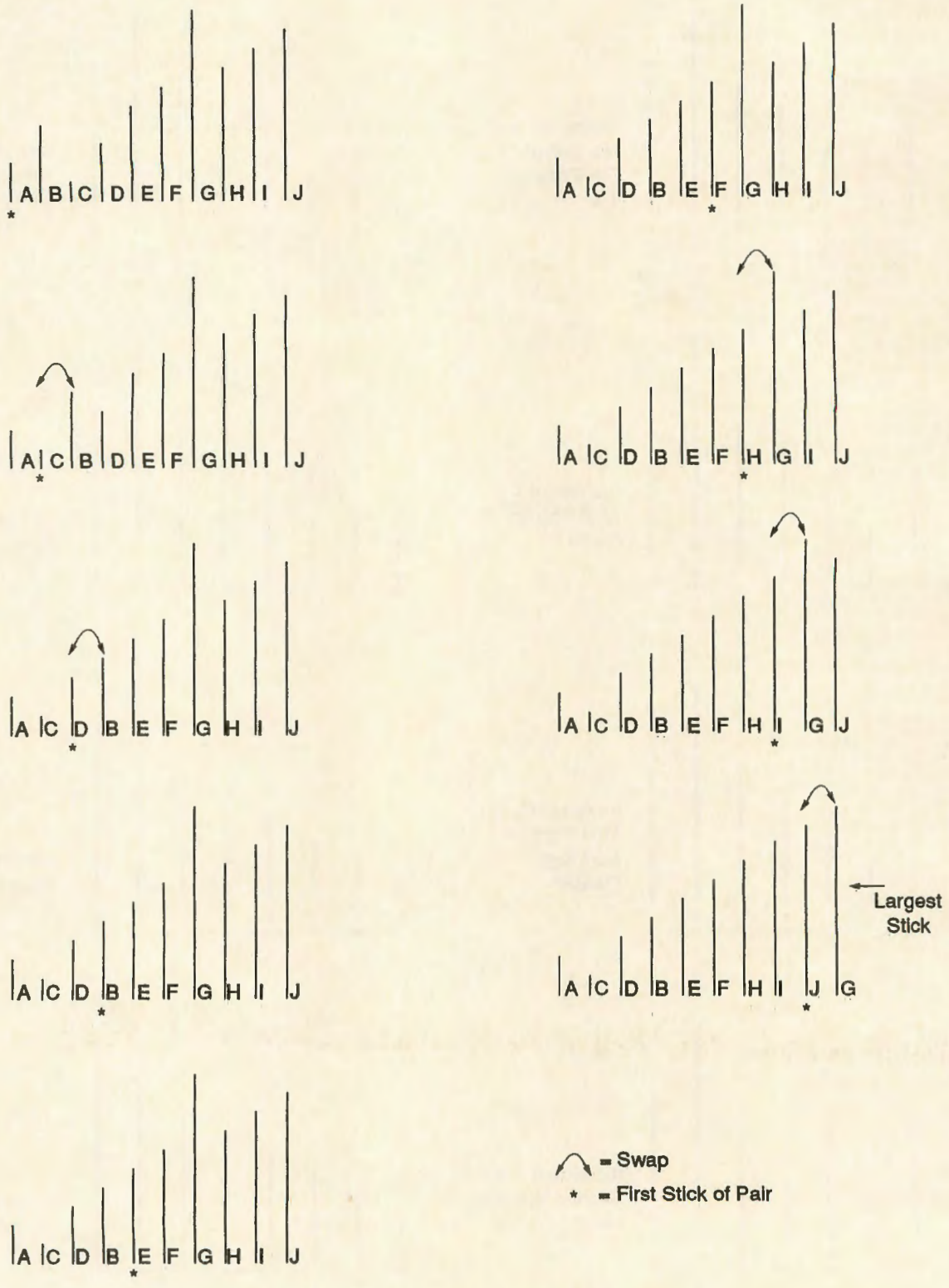



**Figure 4: One Pass of a Bubble Sort**

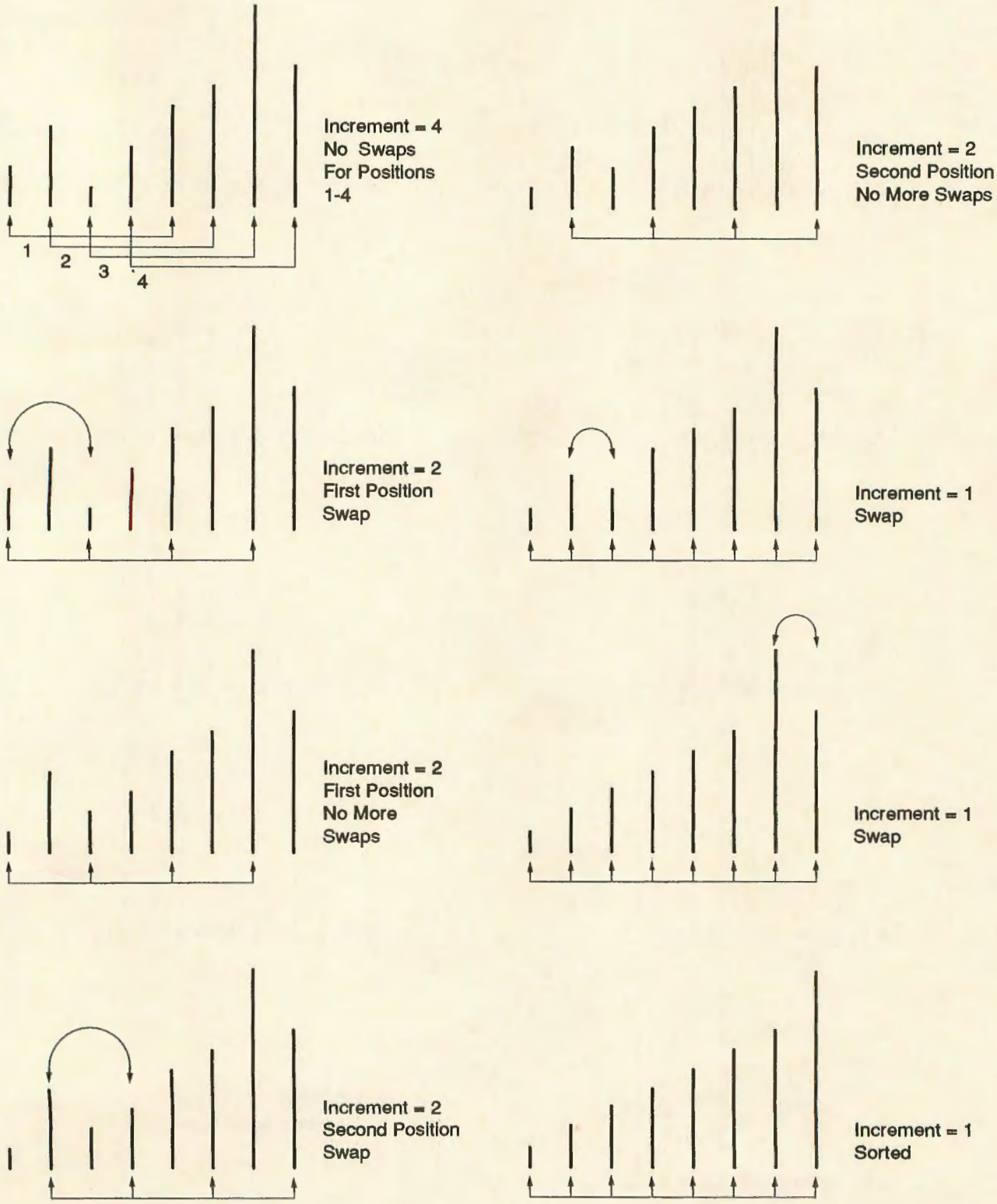



**Figure 5: Shell Sort of Eight Sticks**

NO(I) and NO(I + 1). A swap flag, held in SW, is set to 1 if a swap occurred. The sort ends when SW = 0 after a pass (no swap occurred) or J reaches 1.

Although the logic for the Bubble Sort is easy, it has one big disadvantage — it's slow for unsorted data. The sort in Listing 2 takes about 3 minutes to sort a screen of 126 sticks (values) when random stick lengths are used and screen graphics are not updated. When screen graphics are updated, the sort takes about 16 minutes. On the other hand, the sort is almost instantaneous when the data *is* sorted and very fast when only a few values are out of order. By comparison, the Selection Sort would slog through all 126 passes!

**The Shell Game**

Why is the Bubble Sort so slow? Although you can think about it abstractly, it's obvious from the screen — it takes many passes to move a stick that's out of order across a whole screen, and there are many sticks to be moved. It would be nice to bypass the tedious swapping and just throw the sticks in about the right location based upon length. You could then do a more detailed sort after the sticks were approximately arranged in order. This is the idea behind the *Shell Sort* program, shown in Listing 3.

The first part of the *Shell Sort* program generates the same type of random data as in the two preceding sorts — 126 sticks with values in array NO(). The line display subroutines are at the end, as in the previous program. The actual shell sort is in the middle of the program.

The Shell Sort is more complicated than the Bubble Sort but is about five times faster — the program taking about three minutes instead of 16. This sort is *much* faster than the Selection Sort when the screen data is not updated (*Selection Sort* only re-draws 126 pairs of lines, but *Bubble Sort* and *Shell Sort* re-draw the lines constantly). A sort utility would not waste time displaying the sort data as we are doing.

The operation of the Shell Sort is obvious from the screen. The program uses an *increment* that spans the width of sticks. The increment begins at half of 126 — 63. Using this increment, sticks 1 and 64 are compared, and swapped if they are out of order. Next, sticks 2 and 65 are compared and swapped if out of order. This process continues until sticks 63 and 126 are compared. The pass is like the Bubble Sort — but with gaps. At the end of the first pass, many sticks have been moved approximately to the proper position. If any swaps occurred, the same increment — 63 — is used again. The increment of 63 is maintained until no swaps occur.

Next, the increment is divided approximately in half, to 31 (fractional values are not meaningful here, so a BASIC INT function is used to find the next lower integer value for the increment). Now the width of sticks are scanned again — a Bubble Sort of four items (i.e., Stick 1 is compared to Stick 32, Stick 32 to 63, Stick 63 to 94 and Stick 94 to 125). At the end of this pass, the smallest stick has been moved to Position 125. The increment of 31 is maintained until no swaps occur.

Now increments of 15, 7, 3 and 1 are used to further sort the data. The increment of 1 is really a Bubble Sort, but at this point most of the sticks have been positioned near their proper positions and the sort is much faster. The sort is over when the increment has been reduced to 0.


## NEW FOR OS-9™: *FORTH09* ™

### from D. P. JOHNSON

**FORTH09** is a FORTH-83 Standard implementation specially taylored for OS-9. Includes the double number extension word set, system extension word set, complete forth 6809 assembler and more. Programs written in forth can instantly be saved as compact executable machine language modules. The FORTH09 system runs on any level I or level II OS-9 (6809) machine with at least 32k of available memory and one disk drive. Saved Forth09 application code is romable, reentrant and fully position independent, requiring as little as 3k for a small program. Where maximum speed is required the user can force small code words to be automatically compiled as in line code rather than subroutines. Supplied with complete printed documentation. **$150.00** (+ $3 S&H) Specify disk format if other than CoCo OS-9 format desired.

### Other OS-9 SOFTWARE from D. P. JOHNSON

**L1 UTILITY PAK** - Contains 40 useful utilities that run under both level I and II OS-9. Included are a complete set of "wild card" file handling utilities, a disassembler, a disk sector editor, and the MacGen command language compiler. MacGen will allow you to generate many useful command macros in minutes, much more useful than procedure files. Macro source is included for a macro to implement an archival backup type function. **$49.95**

**L2 UTILITY PAK** - Contains a Level II "printerr" function that also **shows the pathname being searched for** when "not found" or permission type errors occur. Also contains level II software ram disk driver. Ten other utilities included, some useful for level I also . **$39.95**

**L1+L2 COMBINATION PAK** both of above together for **$75.00**

**SDISK** - Standard disk driver module replacement allows full use of 40 or 80 track double sided drives with OS-9 Level I. Full compatibility with CoCo 35 track format and access all other OS-9 non-CoCo formats. Easy installation. **$29.95**

**SDISK+BOOTFIX** - As above plus boot directly from a double sided diskette. **$35.95**

**SDISK3** - Level II version of SDISK driver. Same features as level I (except bootfix not required to boot from double sided). **$29.95**

**PC-XFER UTILITIES** - Programs to format and transfer files to/from MS-DOS™ diskettes on CoCo under OS-9. (Requires either SDISK or SDISK3 to run depending on which level of OS-9 you are using) **$45.00**

**MSF** - MS-DOS disk format file manager. More complete file transfer capabiltites for level II only. (Requires SDISK3 to operate).

Now supports 720K 5-1/4" and 3-1/2" MS-DOS Formats. **$45.00** MSF+SDISK3 together **$65.00**

All diskettes are in CoCo OS-9 format unless otherwise requested; other OS-9 formats can be supplied for $2.00 additional charge. All orders must be prepaid or COD, VISA/MC accepted, add $1.75 S&H for first software item, + .25 for each additional item, additional charge for COD.

**D. P. Johnson, 7655 S.W. Cedarcrest St., Portland, OR 97223 (503) 244-8152** (For best service call between 9-11 AM Pacific Time, Mon.-Fri.)

OS-9 is a trademark of Microware and Motorola Inc., MS-DOS is a trademark of Microsoft, Inc., FORTH09 is a trademark of D. P. Johnson

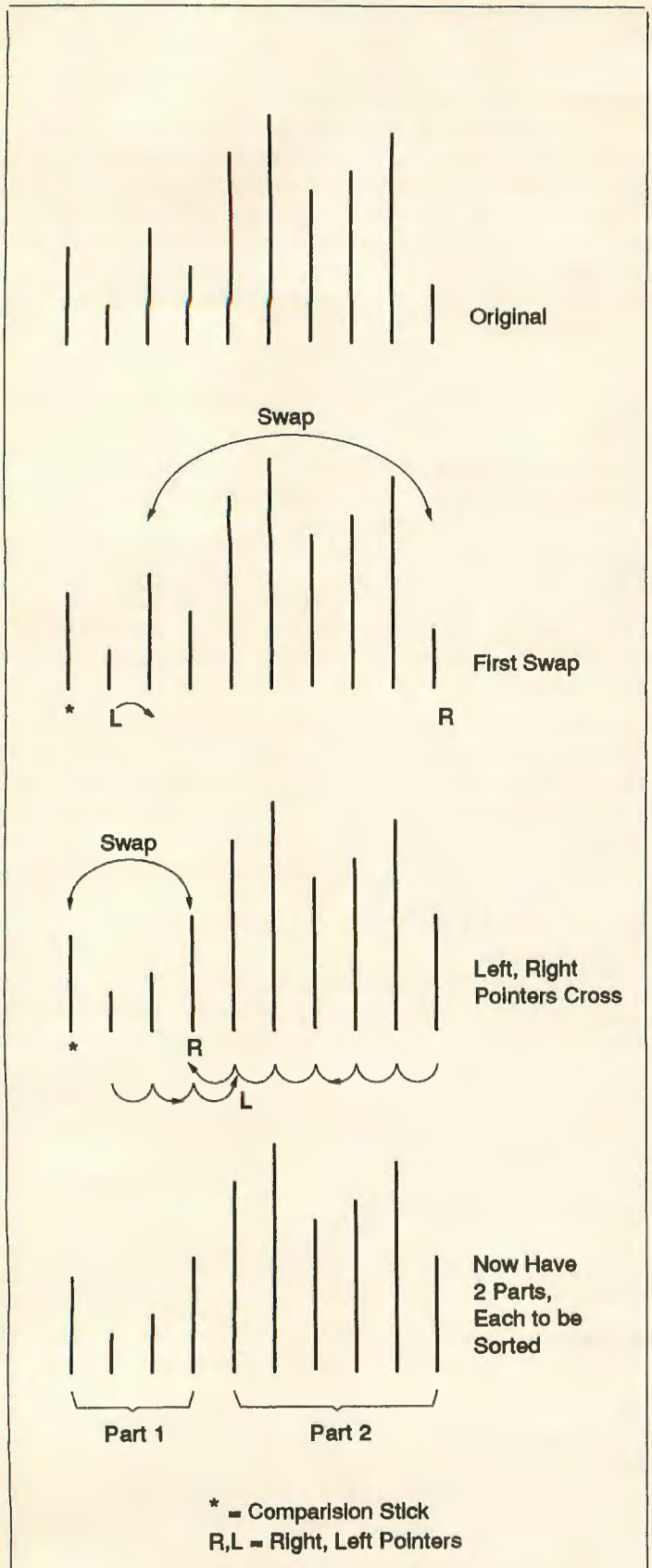



***Figure 6:* Sample Quick Sort Pass**

The process is shown for an eight-stick row in Figure 5.

In the program, Variable IN is the increment, ST is the starting location, EN is the ending location and I is the current location within the range.

**A Quicker Sort**

The quickest sort of all for random data (when screen graphics are not considered) is the Quick Sort. It's more complicated than the Shell Sort, but it sorts screen data in about 45 seconds when graphics are not used and 90 seconds when graphics are used.

> ***"I've seen the Acropolis by moonlight and Los Angeles through the haze, but I'll have to say that the* Quick Sort *display is really* beautiful *to watch — not so much in an aesthetic sense, but beautiful in a logical sense."***

The Quick Sort works like this: Start with a row of 10 sticks again. Now choose the first stick in the row and note its length. The row is now divided into two parts — left and right. Sticks in the left part are of lesser or equal length to the comparison stick and sticks in the right part are of greater length. The sticks are ordered by moving down the row in both directions at the same time. The sort keeps moving from the right until the first stick shorter than the comparison stick is found, and keeps moving from the left until the first stick longer than the comparison stick is found. Those two sticks are swapped, and the sort continues until the comparison has reached the middle of the sort. The comparison stick is then swapped with the last entry of the left portion. A sample pass is shown in Figure 6.

Any stick in the left part is definitely smaller than any stick in the right part. However, within each part, the sticks probably aren't ordered. Now each part is considered separately. The whole process repeats again for the left part. The first stick is used as a comparison stick and the left part is further subdivided into two parts — the left part holding all sticks smaller than the comparison stick, and the right part holding all sticks larger than the comparison stick. The same process is repeated for the right part.

This division into parts continues until each part holds two units. In a 126-stick set, for example, there will be about 63 parts. The beauty of the sort is that sticks are moved over great distances and put into rough order without a lot of overhead.

The main problem with a Quick Sort is that a record must be kept of each part — the position number of the start and the position number of the end. This record keeping calls for a list or array of items. After each sort of a part, the list is used to find unsorted parts, which will then go through the process and generate new parts. A sample of a Quick Sort of a 10-item list — including a record keeping list — is shown in Figure 7.

The *Quick Sort* program is shown in Listing 4. The

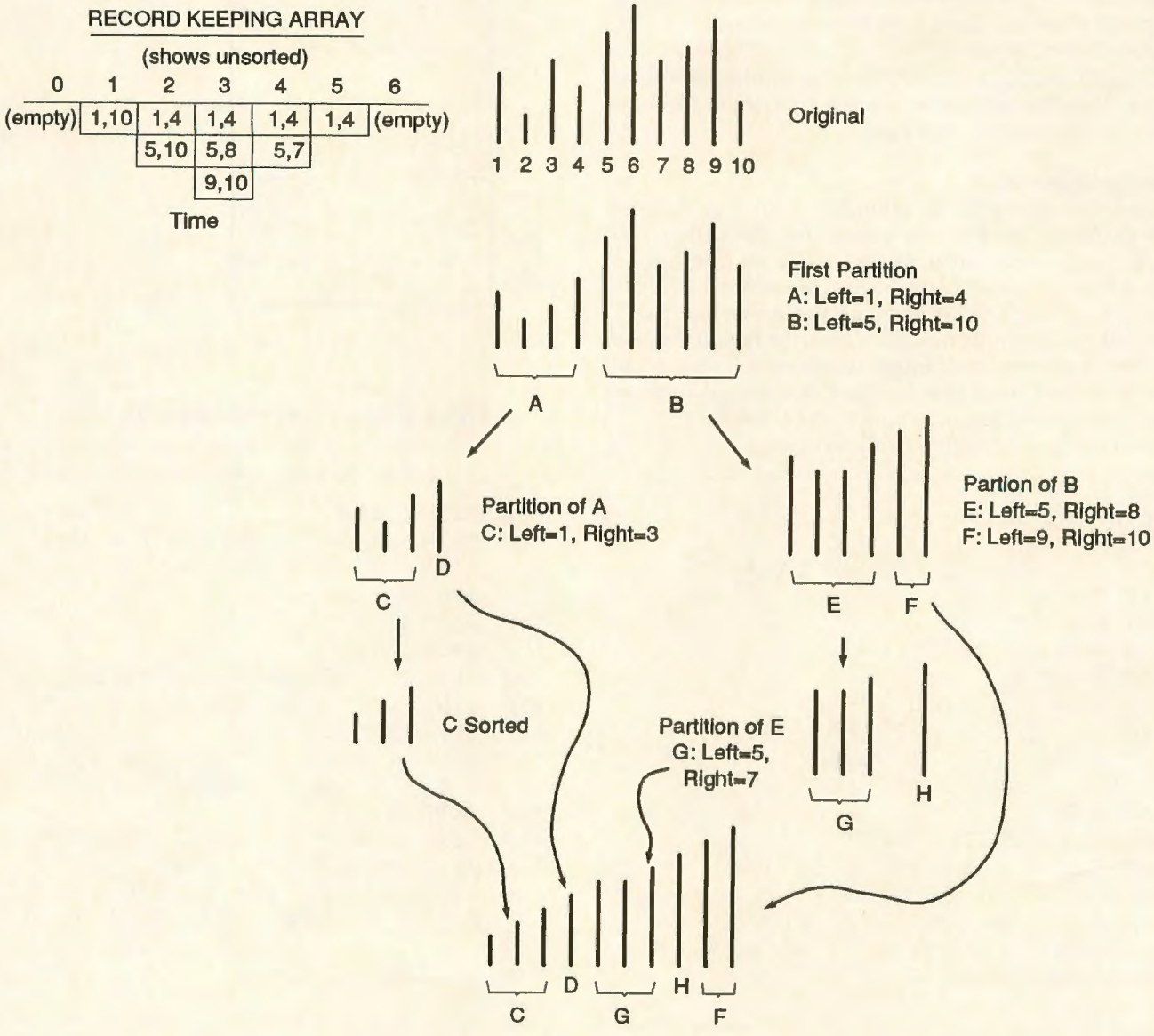



**Figure 7: Quick Sort of a 10-Stick Row**

generate data code is identical, and the line display subroutines are similar, to the other sorts. The actual sort code uses a housekeeping array, LS. The first value of the array — LS(0) — is a pointer to the next available location in the array (see Figure 8). Two values at a time are put into the array — the left- and right-most stick positions. There may be many different sets of these, defining both large and small parts. As parts are sorted, two new parts are created, and the end points of each of these are put into the LS array. End points are taken out two at a time to start a sort process. The sort loops back looking for new parts to sort. When LS(0)=0, all parts have been sorted.

Variables ST and EN are the starting and ending positions for a part. Variables LP and RP are the pointers to this part and move in from the left and right.

**Another Computer Nerd**

I've seen the Acropolis by moonlight and Los Angeles through the haze, but I'll have to say that the *Quick Sort* display is really *beautiful* to watch — not so much in an aesthetic sense, but beautiful in a logical sense. You can easily visualize the sorting process dividing the sticks into parts, sorting those parts, getting new parts from the record keeping list and sorting them, and finally working on very small increments. I hope there are enough CoCoists out there to share my enthusiasm. Let me know if you enjoy it.

See you next month with more CoCo topics. □

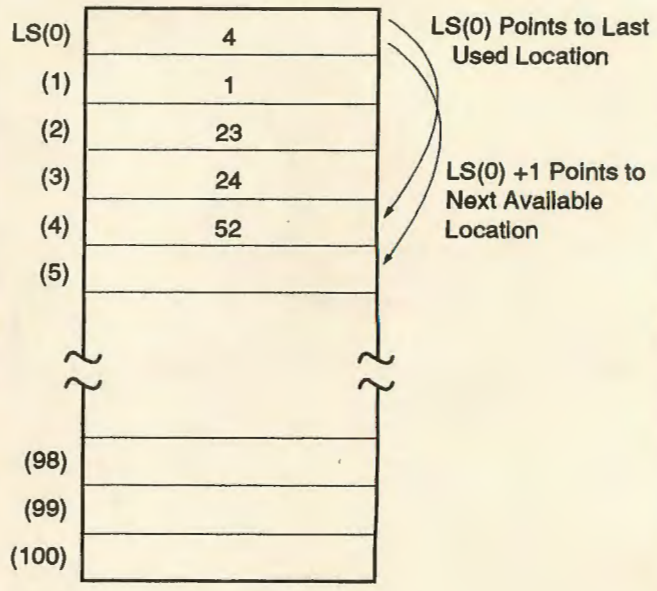



**Figure 8: Quick Sort Housekeeping Array**

**Listing 1:** SELECTON

```
100 ' GENERATE RANDOM DATA
110 PMODE 4
120 SCREEN 1,0
130 DIM NO( 126 )
140 PCLS 0
150 FOR I = 1 TO 126
160 NO( I ) = INT( RND( 190 ) )
170 LINE ( I * 2, 190 ) - ( I *
2, 190 - NO( I )), PSET
180 NEXT
190 ' SELECTION SORT
200 FOR J = 126 TO 1 STEP -1
210 LS = -1: SI = -1
220 FOR I = 1 TO J:IF NO( I ) >
LS THEN LS = NO( I ): SI = I: NE
XT I ELSE NEXT I
230 GOSUB 290
240 TM = NO( J ): NO( J ) = NO(
SI ): NO( SI ) = TM
250 GOSUB 320
260 NEXT J
270 GOTO 270
280 'LINE DISPLAY SUBROUTINES
290 LINE ( J * 2, 190 ) - ( J *
2, 0 ), PRESET
300 LINE ( ( SI ) * 2, 190 ) - (
 ( SI ) * 2, 0 ), PRESET
310 RETURN
320 LINE ( J * 2, 190 ) - ( J *
2, 190 - NO( J ) ), PSET
330 LINE ( ( SI ) * 2, 190 ) - (
 ( SI ) * 2, 190 - NO( SI ) ), P
SET
340 RETURN
```

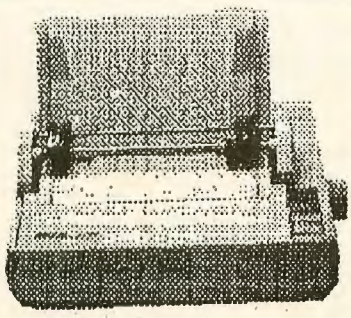
**Listing 2:** BUBBLE

```
100 ' GENERATE RANDOM DATA
110 PMODE 4
120 SCREEN 1,0
130 DIM NO( 126 )
140 PCLS 0
150 FOR I = 1 TO 126
160 NO( I ) = INT( RND( 190 ) )
170 LINE ( I * 2, 190 ) - ( I *
2, 190 - NO( I )), PSET
180 NEXT
190 ' IMPROVED BUBBLE SORT
200 SW = 0
210 FOR J=125 TO 1 STEP -1
220 FOR I = 1 TO J: IF NO( I ) >
 NO( I + 1 ) THEN GOSUB 260: TM
= NO(I):              NO(I)=NO(I+1
):NO(I+1)=TM:SW=1: GOSUB 290: NE
XT ELSE NEXT
230 IF ( SW <> 0 ) AND ( J <> 1
) THEN SW = 0: NEXT J
240 GOTO 240
250 ' LINE DISPLAY SUBROUTINES
260 LINE ( I * 2, 190 ) - ( I *
```

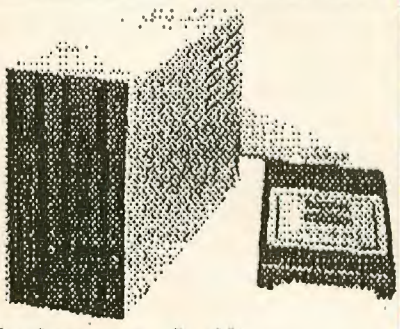
```
2, Ø ), PRESET
27Ø LINE ( ( I + 1 ) * 2, 19Ø )
- ( ( I + 1 ) * 2, Ø ), PRESET
28Ø RETURN
29Ø LINE ( I * 2, 19Ø ) - ( I *
2, 19Ø - NO( I ) ), PSET
3ØØ LINE ( ( I + 1 ) * 2, 19Ø )
- ( ( I + 1 ) * 2, 19Ø - NO( I +
 1 ) ), PSET
31Ø RETURN
```

**Listing 3:** SHELL

```
1ØØ ' GENERATE RANDOM DATA
11Ø PMODE 4
12Ø SCREEN 1,Ø
13Ø DIM NO( 126 )
14Ø PCLS Ø
15Ø FOR I = 1 TO 126
16Ø NO( I ) = INT( RND( 19Ø ) )
17Ø LINE ( I * 2, 19Ø ) - ( I *
2, NO( I )), PSET
18Ø NEXT
19Ø ' SHELL SORT
2ØØ IN = 126
21Ø IN = INT( IN / 2 )
22Ø IF IN = Ø THEN GOTO 37Ø
23Ø ST = 1
24Ø IF ST > IN THEN GOTO 21Ø
25Ø SW = 1
26Ø IF SW = Ø THEN GOTO 35Ø
27Ø SW = Ø
28Ø I = ST
29Ø EN = ST + IN
3ØØ IF EN > 126 THEN GOTO 26Ø
31Ø IF NO( EN ) > NO( I ) THEN G
OSUB 39Ø:TM = NO( I ): NO( I ) =
 NO ( EN ): NO( EN ) = TM: SW =
1: GOSUB 42Ø
32Ø I = EN
33Ø EN = EN + IN
34Ø GOTO 3ØØ
35Ø ST = ST + 1
36Ø GOTO 24Ø
37Ø GOTO 37Ø
38Ø ' LINE DISPLAY SUBROUTINES
39Ø LINE( I * 2, 19Ø ) - ( I * 2
, Ø ), PRESET
4ØØ LINE( ( EN ) * 2, 19Ø ) - (
( EN ) * 2, Ø ), PRESET
41Ø RETURN
42Ø LINE ( I * 2, 19Ø ) - ( I *
2, NO( I ) ),PSET
43Ø LINE ( ( EN ) * 2, 19Ø ) - (
 ( EN ) * 2, NO( EN ) ), PSET
44Ø RETURN
```

COCO ACCESSORIES



**Hardware**

2 Drive System(2 DSDD Drives in one case)* — $329.95

Drive 1 Upgrade(1 DSDD for your 26-3129 or 3131) Specify Catalog# when ordering !! — $119.95

Drive 0-SSDD Full Height* — $209.95
Drive 1-SSDD Full Height — $135.95
COCO 3 512K Upgrade — $219.95
COCO 3 Keyboard — $34.95

Epson LX-800 Printer $219.95
180 CPS - DRAFT
30 CPS - NLQ
3K BUFFER
REQUIRES SERIAL TO PARALLEL INTERFACE

**Software & Misc.**

Art Deli(440 Pix on 10 disks) — $99.95
COCO Graphics Designer — $29.95
ADOS - $29.95 — ADOS 3 - $39.95
Serial to Parallel Converters — $54.95
FKEYS III - $19.95 — Sixdrive - $19.95
Telewriter 64 - $59.95 — COCO-Util - $39.95
Gauntlet - $28.95 — Pyramix - $24.95
Disto Super Controller — $99.95
COCO in Stitch (X-Stitch Patterns)- $ 3.95

*Specify R.S. or Disto Controller.

The Computer Center

IF YOU DON'T SEE IT, ASK US !

ALL DISK DRIVES CARRY A 90 DAY WARRANTY.

5512 Poplar Ave. Memphis, TN 38119 901-761-4565

Add $4.90 for Shipping & Handling. VISA, Master Card, & Money Orders Accepted.
Allow 3 Weeks for personal checks, NO CODS. Prices may change without notice.

**Listing 4:** QUIKSORT

```
1ØØ ' GENERATE RANDOM DATA
11Ø PMODE 4
12Ø SCREEN 1,Ø
13Ø DIM NO( 126 ), LS( 1ØØ )
14Ø PCLS Ø
15Ø FOR I = 1 TO 126
16Ø NO( I ) = INT( RND( 19Ø ) )
17Ø LINE ( I * 2, 19Ø ) - ( I *
2, 19Ø -NO( I )), PSET
18Ø NEXT
19Ø ' QUICKSORT
2ØØ LS( Ø ) = Ø
21Ø LS( LS( Ø ) + 1 ) = 1
22Ø LS( LS( Ø ) + 2 ) = 126
23Ø LS( Ø ) = LS( Ø ) + 2
24Ø IF LS( Ø ) = Ø THEN GOTO 45Ø
25Ø EN = LS( LS( Ø ) )
26Ø ST = LS( LS( Ø ) - 1 )
27Ø LS( Ø ) = LS( Ø ) -2
28Ø LP = ST + 1
29Ø RP = EN
3ØØ DN = Ø
31Ø IF DN = 1 THEN GOTO 24Ø
32Ø IF NO( ST ) >= NO( LP ) AND
LP < RP THEN LP = LP + 1: GOTO 3
2Ø
33Ø IF NO( ST ) <= NO( RP ) AND
LP < RP THEN RP = RP - 1: GOTO 3
3Ø
34Ø IF LP <> RP THEN GOTO 42Ø
35Ø DN = 1
36Ø IF EN - ST = 1 THEN IF NO( S
T ) > NO( EN ) THEN I = ST: J =
EN: GOSUB 47Ø:       TM = NO( ST
): NO( ST ) = NO( EN ): NO( EN )
= TM: GOSUB 5ØØ: GOTO 31Ø
37Ø IF EN = RP AND NO( ST ) > NO
( EN ) THEN I = ST: J = EN: GOSU
B 47Ø: TM =          NO( ST ):NO(
 ST ) = NO( EN ):NO( EN ) = TM:L
S( LS( Ø ) +1 )=ST:LS( LS( Ø ) +
    2 ) = EN: LS( Ø ) = LS( Ø )
+ 2: GOSUB 5ØØ: GOTO 31Ø
38Ø I = ST: J = LP - 1: GOSUB 47
Ø: TM = NO( ST ): NO( ST ) = NO(
 LP - 1 ) :          NO( LP - 1 )
 = TM: GOSUB 5ØØ
39Ø IF LP - ST > 2 THEN LS( LS(
Ø ) + 1  ) = ST: LS( LS( Ø ) + 2
 ) = LP - 1:         LS( Ø ) = LS
( Ø ) + 2
4ØØ IF EN - RP > Ø THEN LS( LS(
Ø ) + 1 ) = LP: LS( LS( Ø ) + 2
) = EN: LS( Ø )=    LS( Ø ) + 2
41Ø GOTO 31Ø
42Ø I = LP: J = RP: GOSUB 47Ø: T
M = NO( LP ): NO( LP ) = NO( RP
): NO( RP )=TM:     GOSUB 5ØØ
43Ø GOTO 31Ø
44Ø GOTO 24Ø
45Ø GOTO 45Ø
46Ø ' LINE DISPLAY SUBROUTINES
47Ø LINE( I * 2, 19Ø ) - ( I * 2
, Ø ), PRESET
48Ø LINE( ( J ) * 2, 19Ø ) - ( (
 J ) * 2, Ø ), PRESET
49Ø RETURN
5ØØ LINE ( I * 2, 19Ø ) - ( I *
2, 19Ø - NO( I ) ),PSET
51Ø LINE ( ( J ) * 2, 19Ø ) - (
( J ) * 2, 19Ø - NO( J ) ), PSET
52Ø RETURN
```


**PREMIUM COCO3 512K UPGRADE**

- Made in USA by J&R Electronics
- Memory chips socketed, user replaceable
- Rugged, long life construction
- Top mounted Memory for cooling
- Heavy duty POWER and GROUND planes to minimize memory errors due to noise
- High performance design, permits use of less expensive 150ns memory chips
- We supply Prime memory chips, not inferior pulls or fallouts*
- Includes RAMDISK, Spooler and Memory Test software on disk with 28 page User's Manual (We set the standard for 512K support software. We believe our software is uniquely powerful, as opposed to those 'Me, too' companies that charge extra for software with much less power!)

**SPECIAL PRICES**

#1010-**29.95** JramR bare board plus connectors and software

#1014-**39.95** JramR assembled & tested ØK (No memory chips) and software

*CALL (for latest price of #1014 with memory chips and other products)

To place an order, write to: **J&R Electronics, P.O. Box 2572, Columbia, MD 21045,** OR call **(301) 987-9067**-Jesse or **(301) 788-0861**-Ray



6 New Public Domain Disks from Australia's User Group **$39.95.** (includes a voice digitizer that speaks)

Do you write or collect PD/Shareware? Write for our donators exchange kit

Set of 36 Disk Library **$129.** Business, Games, Speller, WP, Modems, Painter. PD Catalog $1 or send SASE

15% Discount to User Groups and Students. Major Credit Cards Welcomed. Call Sandra or Joe at 1-800-221-7372.

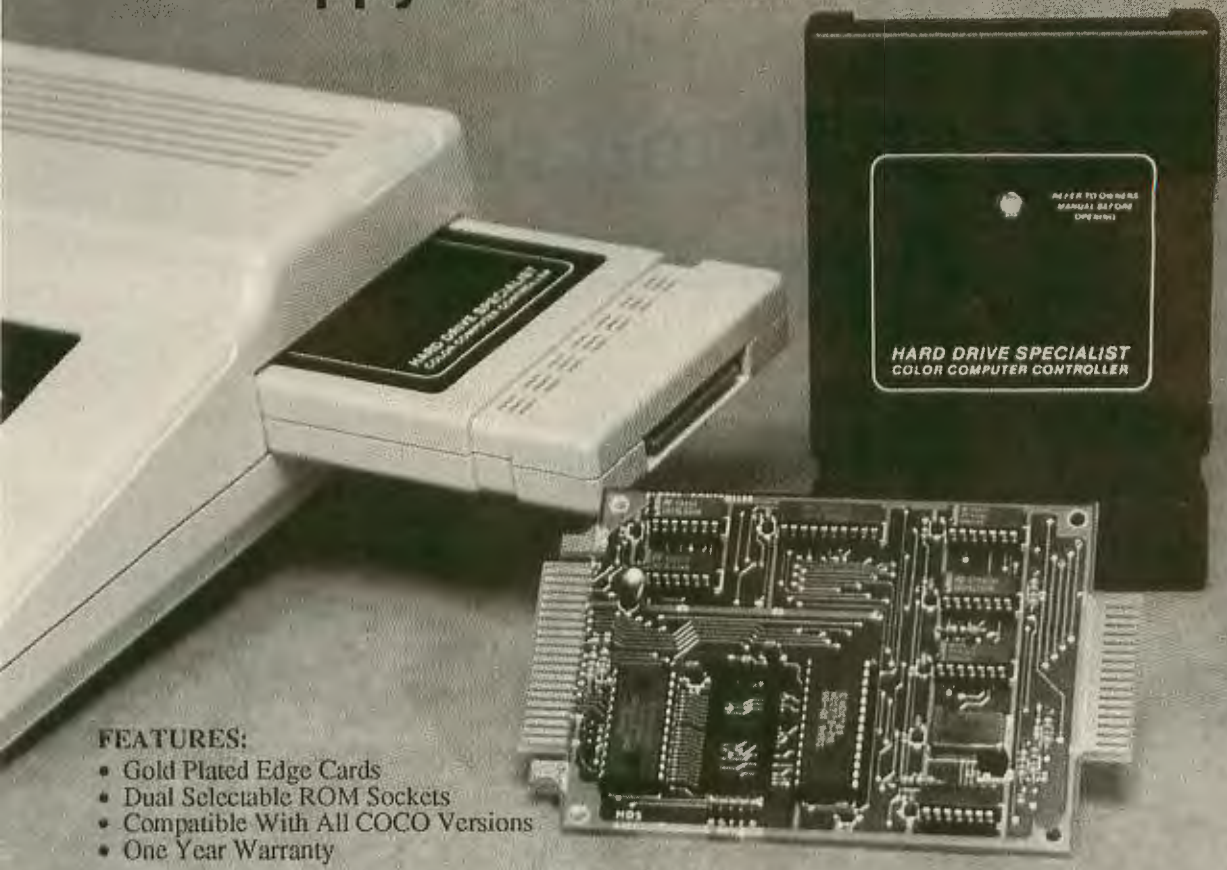
*CHRISTMAS SALE*

Please add $4.50 for Shipping and Handling

**Public Domain Software Copying Company**

33 Gold Street-Suite L3, New York, N.Y. 10038

# New Low Prices! New Products!
# HDS Floppy Drive Controller Board




**FEATURES:**

- Gold Plated Edge Cards
- Dual Selectable ROM Sockets
- Compatible With All COCO Versions
- One Year Warranty

**HARD DRIVE SPECIALIST** has manufactured floppy drive controllers for the Color Computer for SIX years. Buy the controller alone to upgrade your present drive system, or purchase a complete drive 0 to get a high quality drive system loaded with features. This controller allows the use of either two 24 pin ROMS, or one 24 pin and one 28 pin ROM. Using this board with the standard Radio Shack ROM gives you 100% compatibility with all Radio Shack software.

| | |
|---|---|
| **Completed and Tested Board with ROM (includes Case and DOS instructions)** | **$99.** |
| **Completed and Tested Board without ROM (includes case)** | **$79.** |
| **Bare Board with Instruction Manual.** | **$30.** |
| **Parts Kit for Bare Board without ROM** | **$30.** |
| **Radio Shack ROM (current version)** | **$30.** |
| **Double Sided Compatible ROM** | **$20.** |
| **NEW! Magnavox 8CM515 Monitor with Cable for COCO 3** | **$289.** |
| **NEW! 2400 BAUD ZOOM External Modem with Cable.** | **$179.** |

# NEW!

| | 5.25 inch | 3.5 inch |
|---|---|---|
| **Drive 0 Complete** | **$169.** | **$185.** |
| **Drive 1 Complete** | **$119.** | **$134.** |
| **Drive 0&1 Dual Drive Complete** | **$259.** | **$289.** |
| **Bare Drive** | **$85.** | **$100.** |

**Drive Kits** are complete with half height double sided drives mounted in a case with power supply. Drive 0 kits also include cable and controller with ROM. 3.5 inch drives yield 720K when used with appropriate DOS (ADOS, OS9, etc.)

Ordering Information: Use our WATS line to place your order via VISA, MasterCard, or Wire Transfer. Or mail your payment directly to us. Any non-certified funds will be held until proper clearance is made. COD orders are welcome as well as purchase orders from government agencies. Shipping costs are available upon request. If you are not satisfied with your purchase within 30 days, you may return product for full refund excluding shipping costs.

## ORDER TODAY!!

**HARD DRIVE SPECIALIST**
16208 Hickory Knoll ■ Houston, Texas ■ 77059
1-713-480-6000 ■ 1-800-231-6671 EXT 437

# Boot Mysteries Revealed

By Richard A. White
Rainbow Contributing Editor

I have talked about the OS-9 players — the program modules that manage the computer's operation and the specific data files (generally called descriptors) that provide the operating system with the information it needs to work. I have also mentioned that OS-9 can be configured to match your exact system hardware. System configuration is determined by the modules loaded at OS-9's start-up. These modules are included in the Kernel, located on Track

One of the Kernel's functions is to initialize the system and then load OS9Boot. Since the CoCo 3 is different from the CoCo 1 and 2, one would expect the Kernels for the machines to be different. This is partly true. The OS-9 Disk Operating System (Radio Shack, Cat. No. 26-3030) is Level I, Version 1 for CoCo 1 and 2s and will not work on CoCo 3s without modification. A Level I, Version 2 upgrade (special order, Cat. No. 700-2331, $24.95) works on the CoCo 3, but it cannot take advantage of more than 64K of memory or support CoCo 3 graphics. Level II, on the other hand, uses up to 512K of RAM in a CoCo 3 and uses all its graphics features. Level II will only work in a CoCo 3, and it is rather limited in a 128K machine. However, it really shines in a 512K machine.

As you might expect, the Level II Kernel is quite different from the Level I versions. There are changes to other operating system modules as well. The modules to handle the keyboard and screen are new. The disk drive manager, CC3Disk, is also new and now handles any double density drive (single- or double-sided, 35-, 40- or 80-track) you want to connect to your system. Consistent with OS-9's design philosophy, which keeps modules transportable between versions whenever possible, most of the other modules are the same as in Level I.

So the first configuration choice you must make is between Level I and Level II. (It's not much of a choice. Level I on a CoCo 3 is a waste of capability.) This is also the only choice that you can buy from Radio Shack. You must use OS-9's utilities to install all other options yourself. OS-9 Level I and Level II both come on single-sided, 35-track disks. Most users can put the System Disk into Drive 0, type DOS and let the computer boot into OS-9. A few users with older drive controllers will have trouble.

Disk Extended Basic Version 1.0 does not support the DOS command. A short program is provided in the documentation of Radio Shack's OS-9 package that creates a machine language loader. A more costly problem occurs with old, long black controllers sold from 1982 to 1984. Most of these cannot reliably handle the 1.8 MHz CoCo 3 clock speed. This problem is particularly nasty because the controller will *almost* work reliably. But almost isn't good enough, and the only safe solution is to replace the controller.

Next, let us consider what happens during the boot. Generally, this information is not discussed, or it is placed under "technical information" where few will bother to read it. It *is* technical information, but making a new boot is a technical operation — particularly under Level II. The more knowledge you have about the operation, the less confusion you will encounter. I have wandered through my share of OS-9 fog, and I speak with authority. Don't let this scare you. I survived and so will you. After all, if you learned to walk and talk, you can learn to make a boot file.

The DOS command under Disk BASIC causes the code on Track 34 to be loaded and executed. (Since track numbering begins with zero, Track 34 is the 35th track.) Under Level I, this code consists of two modules: OS9 and OS9p1. The Level II code includes three modules: REL, Boot and Os9p1. In both cases, these modules initialize the machine, complete the boot operation, link to all the other system modules as they are loaded, and provide basic system services (i.e., memory management and multitasking).

### Merging Files

Completing the booting process includes loading the OS9Boot file. This file merges all the system modules to be used. Merging files is a particularly useful tool under OS-9 — especially

*Richard White lives in Fairfield, Ohio, has a long background with microcomputers and specializes in BASIC programming. With Don Dollberg, he is the co-author of the* TIMS *database management program.*

under Level II. Understanding the operation can be quite useful, so make the effort to learn the process.

A normal OS-9 file starts at the beginning of a sector (256 bytes) of a disk. The file's end will use part of another sector, the remainder of which is wasted. When a number of files are merged into a single new file, each merging file follows immediately after the preceding file. No space is lost. A directory will list the new file, but not the names of the files it contains. Because these merged files still maintain their individual identities, the `Ident` utility will show the header information for each file contained in the new one. With your system disk in `/d0`, type `ident /d0/OS9boot`, and you will see what I mean.

When you load a file into memory, OS-9 starts that file at the beginning of a 256-byte page under Level I or at the start of an 8K block under Level II. Therefore, if you load three 1K files individually under Level II, you will use 24K of memory. Memory is too dear for this kind of waste.

A merged file starts loading into memory like any other file — at the beginning of a page or block. However, the files it contains are loaded immediately following each other in memory. Page and block boundaries are disregarded. Considerable memory is saved — especially with device descriptors, which typically use only 50 to 80 bytes. Since many OS-9 utilities are small, merging five, 10 or even 15 files into a single file allows those files to be placed in one 8K block. Even those of us with 512K CoCo 3s enjoy this memory saver.

So `OS9Boot` is simply one file into which all the system modules you will use are merged. The code that loads `OS9Boot` is rather simple, too. Consequently, make sure that `OS9Boot` is not divided into a number of places on your disk (OS-9 will split up a file if need be to make best use of disk space). When you make a new boot disk, use a freshly formatted disk to avoid this problem.

### *Shell*

Under Level I, everything OS-9 needs should be included in `OS9Boot`. Once `OS9Boot` has been loaded, run the `StartUp` file. `StartUp` is a text file that contains commands you could have typed in at the OS9 prompt. Files of this nature are sometimes called procedure files or shell scripts.

*Shell* is a program that allows the computer to interpret any command entered into it. The logical people who wrote OS-9's interpreter named it *Shell*. OS-9's *Shell* normally takes its input from the keyboard, but it can take it from a text file as well. Think of all the commands that you can type at the OS9 prompt as a language. A text file of those commands would be like a program. In fact, Level II has a rich selection of graphics commands that can be entered at the OS9 prompt using `Display`. You could write a large text file of `Display` commands and generate a full-color picture, complete with text, using no "language" other than OS-9. The `StartUp` file can get quite long, particularly under Level II.

Under Level I, *Shell* is normally included in `OS9Boot`. This option uses the least memory. A different strategy applies under Level II. *Shell* is more a utility than a system module, and it does not need to be in the `OS9Boot`. No matter how much memory is in the computer, a 6809 microprocessor can deal with only 64K at a time. The CoCo 3 and OS-9 manage memory by switching 8K blocks in and out of the microprocessor's 64K "work space." If *Shell* is loaded separately from `OS9Boot`, it does not have to be in the "work space" at the same time as the boot modules. In this manner, the boot can contain other modules that need to be there. Thus, under Level II, *Shell* is loaded separately with a command included in the `StartUp` file and does not need to be in the `CMDS` directory of your boot disk, if a full path to it is provided in the `StartUp` file.

While *Shell* is less than 2K bytes, the `Shell` file supplied on the Level II system disk is really a merged file that includes several other frequently-used utilities, which almost fill an 8K block.

Another point at which Level II differs from Level I is the video and keyboard area. To take full advantage of CoCo 3 graphics and text options, additional code was needed. This code was divided among several modules. One such module, `GrfDrv`, is loaded separately and is not included in `OS9Boot`. `GrfDrv` is loaded immediately after `OS9Boot`, before the `StartUp` file. Consequently, it *must* be in the `CMDS` directory of your boot disk.

At this point, we know some of the things that must be on a boot disk. The Kernel must be on the 35th track on the front of the disk. On a single-sided disk, this is Track 34. On a double-sided disk, OS-9 counts the first track on the front as Track 0, the first track on the back as Track 1, etc., toward the center of the disk. In this case, Track 34 is not on the 35th top-side track. However, Disk BASIC does not know about double-sided disks. When you boot from a double-sided disk, it looks at the 35th top-side track for the Kernel. Boot-making utilities provided with Level I assume you are using single-sided disks and do not properly deal with double-sided disks even if you have replaced your standard disk I/O driver with one that uses double-sided disks. On the other hand, Level II utilities handle double-sided disks properly. In this case, the utilities provided with Level II


**Check Account Information System**

Not just another checkbook program but a user friendly, menu driven, disk based information system. Keep track of deposits, checks, ATM withdrawals and other account transactions. Define up to 36 categories to monitor expenses. Set up automatic transactions for such items as direct deposits and deductions. Balance your account(s) in minutes! Other features include multi-drive capability, display and print options, check search on any field, edit and delete capability and more.

CoCo 3 compatible
Printer optional

RAINBOW CERTIFICATION SEAL

After Five Software
P.O. Box 210975
Columbia, SC 29221-0975
(803) 788-5995

Send check or M.O. for
$34.95 plus $3.00 S/H
COD orders: add $2.00
(SC res. add 5% sales tax)

Reviewed in RAINBOW, February 1988.

are different from those of the same name in Level I.

The OS9Boot file must be a continuous file in the root directory. A StartUp file must also be in the root directory. There must be a CMDS directory on a Level II boot disk. GrfDrv and the Shell file must also be available for loading when the StartUp file runs.

The simplest way to make a new boot disk is to back up the one you already have. Naturally, you will have followed the directions in the documentation and backed up the operating system disk that comes with your OS-9. Right? Whenever you make a new boot disk, back it up as well.

Next you can use the program, *Cobbler*. *Cobbler* uses the system modules as they exist in memory at the time to make a new boot disk. Start with a freshly formatted disk. *Cobbler* will then copy the Kernel modules to the 35th top-side track and put all other modules loaded from OS9Boot into a new OS9Boot. The primary purpose of this program is to save changes made to descriptors with Xmode.

Most users will need to change /t1, /t2 and /p from their defaults to match their current setups. /t1 and /t2 describe how the RS-232 ports work. One default setting is 300 baud. Most of us now use 1200 baud for telecommunications, and some use 2400 baud. If you want to run at a baud-rate higher than 300, include an Xmode command in your StartUp file to change /t1 or /t2 each time you boot. Similarly, few of us still run our printers at the 600-baud default. This can be changed by using Xmode on the /p descriptor. However, these changes only last through the current session and are lost as soon as you turn off your computer. When you use *Cobbler* to make a new boot disk, the descriptors in OS9Boot will include the modifications made using Xmode, so you can eliminate the Xmode steps from your StartUp file.

**Using Dsave**

The boot disk you make with *Cobbler* contains only the Kernel and OS9Boot. You must also add the remaining directories and files on your starting boot disk. To do this, use Dsave, which will copy or back up all files in one or more directories — including a whole disk. Dsave will not copy OS9Boot unless that option is specifically selected.

In addition, Dsave does not directly copy files; it makes a procedure file that you later run to do the job. There are a number of advantages to this procedure. You can edit the procedure file and eliminate copy commands for files you don't want to copy or add copy commands for files you want to copy from a disk in a different drive. Additionally, the copy or backup does not depend on the source and target disks being the same. Use this procedure file to make the 35-track system disk from your OS-9 package a double-sided 40-track boot disk, or to move the contents of a boot disk — excluding the Kernel, Os9Boot and Grfdrv — to a hard drive. To boot, most hard drive users load the Kernel, OS9Boot and GrfDrv from a floppy in /d1. After the initial loading, OS-9 discovers an /h0 device descriptor and automatically continues the boot procedure from the hard drive.

When using Dsave, change your data directory to the one you want to copy. (The term *one or more directories* can mean a whole disk, since Directory /d0 is the root directory of the disk in Drive 0, and all files and subdirectories on that disk are under the root directory.)

Next, determine which Dsave options you want to use. The only one we need to consider now is the 's' option. The format for this option is -s *integer*, where *integer* is the amount of memory, in kilobytes, you want to allocate to the copy process. The entry, -s20, will allocate 20K bytes, which will handle nearly all files on a boot disk. Now you may want to decide to which drive (and, possibly, to which directory on that drive) you want to copy. Finally, you need to name the procedure file Dsave will make and choose the drive and directory on which it will be stored.

Now, let's see how Dsave works. First, use *Cobbler* to put the Kernel and OS9Boot on a freshly formatted disk. Put the Level II system distribution disk in Drive 2. (Generally, you will find it more convenient to have your source disk in Drive 0.) Putting the disk in Drive 2 will better demonstrate the flexibility of Dsave. Next, type the following:

```
OS9:chx /d2/cmds
OS9:chd /d2
OS9:dsave -s20 /d2 /d0 >/d2/
    makecopy
```

Because the process requires the use of several program modules, the first line is used to change the current CMDS directory to /d2. The next line puts you in the root directory of /d2, from which you want to copy. The final line enters the Dsave command. Option -s20 tells Dsave to have Copy allocate 20K bytes of buffer for each copy operation. The descriptor, /d2, reminds Dsave that you want override the built-in /d0 default and copy from Drive 2. The descriptor, /d0, tells Dsave to copy to drive 0 and to include a chd /d0 line in the procedure file. Finally, >/d2/make-copy directs the resulting procedure into a file named makecopy on /d2. The following is a shortened version of the resulting procedure file:

```
  t
  chd /d0
  tmode .1 -pause
  load copy
  Makdir CMDS
  Chd CMDS
  Copy #20K /d2/CMDS/attr attr
  Copy #20K /d2/CMDS/backup
       backup
.
.
.
  Copy #20K /d2/CMDS/unlink
unlink
  Copy #20K /d2/CMDS/xmode
xmode
  Chd ..
  Makdir SYS
  Chd SYS
  Copy #20K /d2/SYS/errmsg
       errmsg
.
.
.
  Copy #20K /d2/SYS/stdptrs
stdptrs
  Chd ..
  Copy #20K /d2/startup start-
       up
.
.
.
  Copy #20K /d2/makecopy make-
copy
  unlink copy
  tmode .1 pause
```

In this file, t is a shell command that tells *Shell* to display each line in the procedure file on the screen so we can keep up to date on what is happening. Tmode .1 -pause tells *Shell* not to stop the display and the procedure after a certain number of lines are printed to the screen. The *Shell* default stops printing so you have time to see what was displayed and press ENTER to continue. The .1 refers to the standard output to your screen. (Note at the bottom of the listing, Tmode .1 pause returns the pause feature.)

Next is a Load Copy command. Since Copy is used so often, it saves time to

load it once and unlink it at the end of the procedure. If Copy is already loaded, the Load command increases its link count by one, and Unlink decreases the link count by one. Copy stays in memory. Next, Makdir CMDS creates a CMDS directory. Dsave's default assumes that none of the needed directories on the target disk exist and that it will have to include commands to make these directories. This is exactly what we need here. The procedure file has used four OS-9 utilities: Tmode, Load and Makdir, which must either be in memory or in your current CMDS directory, and Copy. (Since the line Load Copy is used, OS-9 will try to load it from your CMDS directory whether it is in memory or not, so you must have Copy in your CMDS.) At the end of the procedure file, Unlink is used so it must be in memory or in the CMDS directory as well.

Having made a CMDS directory, chd CMDS makes that the current data directory and copying begins. Each Copy command includes #20K, which tells the program to use a 20K-byte buffer. We used the option -s20 to instruct Dsave to include this. Since /d0/CMDS is the current data directory, Dsave includes a full path (i.e., /d2/CMDS/attr) to the file to be copied; but since the file is being copied into the current data directory, Dsave needs only to provide the target file's name.

Most of the rest of the procedure file, except for Chd .., is repetitious. The ".." is shorthand for "previous directory above the current one." When I started Dsave, my current data directory was /d2. Since the disk in /d2 is the one I want to copy and I saved the procedure file, makecopy, onto that disk, I need only to put my target disk into /d0, type makecopy to start the procedure file, and get a drink or do something else while the process takes a few (long) minutes to run.

If you think this is easy, there is a better shortcut for those who don't want to edit the procedure file. Don't make a procedure file at all, just redirect the output for Dsave directly into *Shell* for immediate execution. Using our previous example, put the source disk in /d2 and the target disk in /d0, and type the following:

```
OS9:chx /d2/cmds
OS9:chd /d2
OS9:dsave -s20 /d2 /d0 ! shell
```

Everything is the same in this second example except that >/d2/makecopy is replaced by ! shell. The '!' is the set of pipe commands that routes the standard output of the foregoing process into the standard input of the following process. Look at page 6-41 in your Level II manual and circle the short paragraph that covers this, since you will certainly want to find it quickly in the future. When you type Dir, you get a listing on the screen of the names of the modules and directories in your current data directory. *However, if* you type Dir e, you will get that listing in much greater detail, including the date and time the file was saved, attributes of the file, the starting sector on the disk and the byte-count of the file. Well, the byte-count of *this* file has gotten large enough that I had better quit for this month.

My next column will cover the OS9Gen and Config processes for making a boot disk. We will also discuss the infamous, unsolvable, Level II boot order problem that has totally confounded all the experts since Level II for the CoCo 3 first came out. I will leave you pondering this enigma until next month.

JOYSTICK
ALTERNATIVE
CONTROLLER
with **RAPID FIRE**

ARCADE-TYPE ACTION CONTROL USING YOUR ATARI-TYPE JOYSTICK. SPECIAL PRICE $4 OFF REG. $22.50

**$18.50**

**"UNIQUE RAPID FIRE OPTION"**

**STOP** **$14.95**

SAVE TIME ON PAUSE! OUR ORIGINAL PAUSE CONTROL PLUGS INTO YOUR MULTI-PAK, Y-CABLE, OR PROGRAM SLOT. PAUSE ANY COMPUTER FUNCTION AT THE TOUCH OF A BUTTON. **$14.95**

**4-TECHS — NEW HORIZONS FOR THE COCO**

**4-TECHS**
4-TECHS
P.O. BOX 2575
MERRIFIELD, VA
22116-2575

Check or money orders, American funds only. For orders up to 5 add $2.50 postage and handling, Canada $4 P/H. 4-6 wks. delivery

**FILE TRANSFER UTILITIES**

You asked for it at the Chicago RainbowFest -

**FILE TRANSFER UTILITIES NOW HANDLE RSDOS DISKS!**

Need to transfer text files to and from PC (MSDOS), RSDOS and FLEX disks into your CoCo (OS-9) system? Have text files on a PC (MSDOS ) system at work and want to work on them at home on your CoCo?

With GCS File Transfer Utilities you just place the PC (MSDOS), RSDOS or FLEX disk into your CoCo disk drive - enter a simple command and the file is copied into a CoCo OS-9 file. File transfer back to PC (MSDOS), RSDOS and FLEX disks is just as simple.

| | | | |
|---|---|---|---|
| **PCDIR** | directory of PC disk | **RSDIR** | directory of RSDOS disk |
| **PCDUMP** | display PC disk sector | **RSDUMP** | display RSDOS disk sector |
| **PCREAD** | read PC file | **RSREAD** | read file from RSDOS disk |
| **PCWRITE** | write file to PC disk | **RSWRITE** | write file to RSDOS disk |
| **PCRENAME** | rename PC file | **FLEXDIR** | directory of FLEX disk |
| **PCDELETE** | delete PC file | **FLEXDUMP** | display FLEX disk sector |
| **PCFORMAT** | format PC disk | **FLEXREAD** | read FLEX file |
| | | **FLEXWRITE** | write file to FLEX disk |

***Extensive Options*** Single, double sided disks. 40 or 80 track floppy drives. 8 or 9 sectors. First level sub-directories - PC (MSDOS). FLEX transfers binary files also.

***Requires*** OS-9 (Level 2 for MultiVue), 2 drives (one can be hard), MultiVue for MultiVue version, SDISK (SDISK3 for MultiVue) - see D.P. Johnson ad for SDISK

**GSC File Transfer Utilities for CoCo - MultiVue version $54.95**

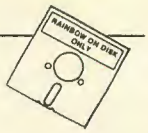
**GSC File Transfer Utilities for CoCo - Standard version $44.95**

All diskettes are **CoCo OS-9** format. Orders must be prepaid or COD, VISA/MC accepted, add $1.50 S&H, additional charge for COD.

**GRANITE COMPUTER SYSTEMS**
Route 2 Box 445 Hillsboro, N.H. 03244
(603) 464-3850

RAINBOW CERTIFICATION SEAL

OS-9 is a trademark of Microware Systems Corporation and Motorola Inc.
MS-DOS is a trademark of Microsoft Corp. FLEX is a trademark of TSC, Inc.




# Installation, Automation and More

**By Dale L. Puckett**
**Rainbow Contributing Editor**

November is a good time to start some serious programming. I hope that this month's interview will help you get more enjoyment out of those long sessions with your CoCo.

*CCEnv*

Allow me to introduce a man who got tired of the complicated and redundant process required to compile C programs — and did something about it. Chris Fox has been programming since 1978 when someone gave him a Casio calculator that spoke BASIC. He started working with C four years later.

Fox bought a CoCo 2 with 16K of memory because he wanted to work with graphics and color. (It was also one of the only computers on the market he could afford.) He learned a lot with his CoCo 2, but he wanted to learn more. When OS-9 came out in 1983, he had to have it. When the Microware C compiler came out, he had to have that, too. The compiler was Fox's first experience with C language, and it took him a long time to learn the language and use the compiler. He explained: "I didn't have a second disk drive and didn't know I needed it. I really got things moving when I caught on and started using a RAM disk to compile my C programs. The RAM disk worked so well for me that I made it an automatic feature in *CCEnv*."

Fox wrote *CCEnv* because he was tired of the long directory names and command line options used to run the OS-9 text editor. *CCEnv* eliminated these length requirements.

Yet, *CCEnv* works with almost all OS-9 languages. You can run your Pascal compiler with it — or use it to assemble programs written for ASM or RMA. The *CCEnv* manual pages will even clip into your *Multi-Vue* manual.

An intelligent project manager is built into the program. "It's a graphics Make," Fox said. "It checks the date. If a text file has been updated, it's recompiled. If you have enabled the project option, *CCEnv* links to any relocatable object code you have written during the programming project. It automatically uses the startup code in CStart.r and the standard library, so you can split your programming projects into segments."

Fox's company, Foxware, sells a graphics library that works with C.Link in the original C compiler package and a C math library. Fox also offers a BASIC09 math library, and a BASIC09 mouse and menu library that help you create mouse-driven applications with pull-down menus. The latter contains many routines similar to the *Gfx3* package published in last month's column.

The Foxware graphics library includes a function that returns a pointer to the device name string. This makes it easier to use redirection from within your own program. While you can issue a fork call without the *devname* function, you can't redirect any output. To do that, you must know the name of the device receiving the output, not just the path number. *Devname* enables dynamic redirection — you can find an available window and redirect output to it immediately. The graphics library also includes a function that calls the device /w and returns the path number for you.

Essentially, *CCEnv* is a graphics driver for OS-9 compilers and assemblers, which lets you issue commands with a mouse-and-menu and eliminates long command lines. It also remembers compiler options and keeps track of your directories.

Chris Fox guarantees that there will be at least one less manual open on your lap when you use *CCEnv* to program. Fox used the Microware C compiler for more than a year before he tried *Turbo C* (one of the most convenient MS-DOS C compilers). He was struck by the ease of program development and determined to develop something similar for the CoCo 3.

Although Fox bought an IBM-compatible computer and intended to move on to the more *sophisticated* PC, it never happened. Fox explained, "After investing a few months to learn DOS, I realized that OS-9 is a superb operating system. I preferred the CoCo 3." Fox now uses his Tandy 1000 TX almost solely as a terminal for his CoCo 3 when he runs OS-9 Level 2.

---

*Dale L. Puckett, a freelance writer and programmer, serves as director-at-large of the OS-9 Users Group and is a member of the Computer Press Association. His username on Delphi is DALEP: on packet-radio, K0HYD @ N4QQ; on GEnie, D.PUCKETT2; and on CIS, 71446,736.*

After working on *CCEnv* for a few months, Fox began to use the half-finished program to complete itself. "The results were so pleasing that I decided to generalize *CCEnv* so it could run all OS-9 compilers and assemblers," he said. Fox also realized that this program, which had been developed for his own convenience, would be useful for other programmers as well.

**Equipment**

To run *CCEnv*, you'll need OS-9 Level II and the `WindInt` system module that comes with *Multi-Vue*. The program runs under *Multi-Vue* but can be run independently if `WindInt` is in your `OS9Boot` file. You will also need a mouse and 512K of memory. Compiling a program on the CoCo 3 without a RAM disk is a slow process. Therefore, *CCEnv* automatically writes all temporary files to the drive, `/r0`, if it is available. If that driver is not available, the program will prompt you for a drive name or directory. *CCEnv* will remember this location in its environment file, so you won't need to type it again until you want to change directories.

You must also supply your own OS-9 compiler, assembler and text editor. *CCEnv* is pre-configured for the Microware C compiler but works well with Pascal, `ASM`, `RMA` and `C.ASM`. The *CCEnv* edit menu offers four text editors: *Edit*, *Scred*, *TSEdit* from Tandy and *Xed* from MicroTech Consultants. If you don't own one of these, a fifth menu entry lets you specify your own editor.

To run *CCEnv*, copy two files to your OS-9 system disk. *CCEnv* goes in your `CMDS` directory. `Env.ccenv` goes in `/DD/SYS`. Make sure that any programs *CCEnv* will use are also in your `CMDS` directory. For example, the editor you plan to call from the menu and all the files in the Microware C compiler (except `cc1`) must be in `CMDS`. Additionally, you'll need the utilities you use during a programming session: `Attr`, `Dump`, `Debug`, `Verify` and `Tmode`.

If you would rather not clutter your `CMDS` directory, create a special directory for *CCEnv*, load it with your compiler files, editor and utilities, and change your current execution directory to the special *CCEnv* directory. You can do this before you run the program or from within the program itself; however, include the `StdPtrs` and `StdFonts` files in your `/dd/SYS` directory.

If you look in your modules directory after loading *CCEnv*, you'll see two new modules — `CCEnv` and `ShellCmd`. Run `CCEnv` by typing:

```
CCEnv pathlist options. . .
```

When *CCEnv* sees a hyphen, it knows that it has found an option. Otherwise, it treats a name on your command line as a pathlist to the file you want to compile or assemble. *CCEnv* uses the data directory holding the file you are compiling as its current data directory. Here's a typical *CCEnv* command line.

```
CCEnv filename -v
```

Type this line when you want to run a single session to compile an existing C or assembly program. To configure *CCEnv* to run OS-9 Development Kit assembler, type:

```
CCEnv -a -l -x=startup.a
- z=stdlib.asm -v=env.assm
```

When you type this line, *CCEnv* uses `RMA` to assemble your file and `RLINK` to link your object code. The program substitutes the assembly startup code for `CStart.r` and the standard library for `CLib.1`, and it saves the options you typed in an environment file, — `Env.Assm`. The next time you want to work with your assembler, just type:

```
CCEnv -v=env.assm
```

You can save as many environment files as you like. In fact, you can keep one for each program you develop. (*CCEnv* will automatically keep track of the libraries and other relocatable modules needed for each project.) Store these environment files in your `/dd/SYS` directory.

**Menus**

You'll find six menus on *CCEnv's* main menu bar — Close (a square box), File, Edit, Run, Compile and Option. If you are working with a binary file — a file with an `.r` or no extension — you'll notice that a Module menu replaces the Edit menu. From this menu, you can `Debug` or `Attr` your object code file.

Pop-up menus ask you for information when it's needed. For example, if you name a file with an unrecognized extension, you'll be asked to identify its type. Generally, a pop-up menu will ask Yes or No questions. If *CCEnv* needs a longer answer, it will request the answer in a dialog-box. Essentially, this is the only time you'll use your keyboard while running *CCEnv*. The rest of the time you can just click the mouse. For example, if your compiler runs into an error, you'll find out about it in a message box. After you read the note, click the mouse and the message box disappears. Inappropriate menus are disabled. Thus, if you have not picked a file to edit, the Edit, Run and Compile menus will be disabled.

The File menu allows the following options: Load a file. (You may choose


THE BEST COCO ASSEMBLY LANGUAGE PROGRAMMING BOOKS IN PRINT

**"Assembly Language Programming for the CoCo" (The Book) and the CoCo 3 (The Addendum). Professionally produced (not just skimpy technical specifications). THE CoCo reference books.**

**THE BOOK** - 289 pages of teaching assembly language for the CoCo 1 & 2. It's used as a school text and is an intro to Computer Science. It describes the 6809E instructions, subroutines, interrupts, stacks, programming philosophy, and many examples. Also covered are PIAs, VDG, SAM, kybd, jystk, sound, serial port, and using cassette and disk. $18.00 + $1.50 s/h.

**THE ADDENDUM** - Picks up where the BOOK left off. Describes ALL the CoCo 3 enhancements & how to use them with assembly language. The most complete GIME spec. WOW - Super-Res Graphics, Virtual Memory, New Interrupts, and more information not available elsewhere. Find out what the CoCo 3 can really do. $12.00 + $1.00 s/h.

**COCO 3 SPECIAL** Start your CoCo library right. See what the CoCo can really do and save money - buy the BOOK and ADDENDUM for only $27.00 + $2.00 s/h.

US check or money order. RI orders add 6% sales tax

**TEPCO**
68 James Court
Portsmouth, RI 02871

See Us On DELPHI

any available in the present environment.) Abandon the file you are using. Count the characters, words and lines in a file, or check its syntax. Start an OS-9 Shell on another screen, or exit *CCEnv*. The Edit menu lets you select the editor to be used for a session. If you receive an error message during an assembler or compiler run, a two-window screen will appear on your CoCo. The possible error messages will appear in the six-row window at the bottom of the screen. You can then use them to correct the file in the top window. (This is certainly better than relying on my short memory.)

The Run menu runs the program you just compiled. If the file hasn't been compiled or assembled, *CCEnv* will do this for you and then run the program. This menu will compile, assemble, link and run a program with *one* mouse click.

The Compiler menu gives you four choices:

- To Assembly generates an assembly language file after compiling your C source code.
- To Object converts your assembler, or C source code, to a relocatable object code file with an .r extension.
- To Executable takes your C (assembly, or relocatable object) code file and produces an executable module, linking the new object code to other relocatable code listed in your link list. The file created is automatically stored in your execution directory.
- To Cancel lets you change your mind.

The Assembler, Compiler or Linker options from the options menu will show you *CCEnv*'s pull-down menus. Center the mouse over your selection and click the button. Without moving the mouse, you will now see a second menu. For example, if you click over the word Compiler, you'll be offered three choices in a pull-down menu: optimize defaults, check the 6809 stack, or run the C Profiler. You are presented similar choices when you click on Assembler, Linker, Link-List or Libraries.

*CCEnv* was created to make programming less tedious and more productive. It fills that bill nicely.

### About Assemblers

I received an interesting note from Duane M. Perkins of Mount Gretna, Pa. He suggested that I point out the advantages of RMA — the Relocating Macro Assembler found in OS-9 Level II's Software Development package — over ASM — OS-9 Level I's original assembler.

RMA's main advantage is that it creates object files that can be linked with others later. According to Perkins: "The ability to include assembled functions and subroutines in a module speeds up program development."

Perkins submitted two short — but interesting and useful — listings to make his point: ClkSpd and ClkChk. ClkSpd, used with one of your programs, determines the clock speed of your CoCo 3. This information is essential if your program uses timing loops and must ensure a correct delay interval. ClkSpd calls ClkChk, which determines whether the clock speed is fast or slow and then tells you through a printed message.

You cannot directly execute a file created by the RMA assembler. It must be linked before it is run. However, you can assemble any number of source code files independently and use your linker to create an executable module that includes all of them. The linker also lets you use libraries, which can contain any number of independently assembled files. When you have finished this work with RMA, you will never have to do it again.

Some of the directives used in an RMA program are different than those used in an ASM program. For example, an RMA program uses Psect instead of Mod and Endsect instead of Emod. Another directive, Csect, marks the beginning of a data section and resets the base location counter for data offsets like ASM's directive, Org. In an RMA program, all data sections must end with an Endsect directive, and all rmb statements must be located in a Csect. Also, while your program may have any number of Csects, it can have only one Psect. Incidentally, RMA labels are case-sensitive. You'll need to be careful when typing the names of your subroutines and variables. Tandy supplies a file named OS9Defs.a that contains the standard OS-9 variables in the required Csect or Endsect format. Make sure that the labels used in your source code agree with the listing in this file — letter for letter.

The first module you link must con-

**Listing 1:** ClkSpd

```
   ifp1
   use /dd/defs/os9defs.a
   endc

        psect clkspd,$11,$81,Ø,2ØØ,Enter
Fast    fcc /Clock is fast/
        fcb $ØD
Slow    fcc /Clock is slow/
        fcb $ØD
Enter   lbsr Clkchk
        tsta
        bne Skip1
        leax Slow,pcr
        bra Skip2
Skip1   leax Fast,pcr
Skip2   ldy #32
        lda #1
        os9 I$WritLn
        os9 F$Exit
        endsect
```

**Listing 2:** ClkChk

```
   ifp1
   use /dd/defs/os9defs.a
   endc

        psect Clkchk,Ø,Ø,Ø,Ø,Clkchk
Clkchk:
        orcc #$5Ø
        lda $FFØ2
        sync
        lda $FFØ2
        ldd #2542
Clkchk1 subd #1
          bne Clkchk1
          clra
          ldb $FFØ3
          andcc #$AF
          bmi Clkchk2
          inca
Clkchk2 ldb $FFØ2
          rts
          endsect
```

**Listing 3:** DoMenu

```
PROCEDURE DoMenu
ØØØØ        (* Adding functionality to MVShell
ØØ22        (*
ØØ25        (* Window menu data structures
ØØ43        TYPE Mistr=_mnttl:STRING[15]; _mienbl:BYTE; _mires(5):BYTE
ØØ64        DIM MidScr:Mistr
ØØ6D
ØØ6E        (* The next structure holds the definition of a menu.
ØØA3        TYPE mnstr=_mittl:STRING[15]; _mnid,_mnxsiz,_mnnits,_mnenabl

             :BYTE; _reser2,_mnitems:INTEGER
ØØCF        DIM MNDscr:mnstr
ØØD8
ØØD9        (* The final structure defines the contents of an entire window.
```

```
Ø119      TYPE wnstr=_wnttl:STRING[2Ø]; _nmens,_wxmin,_wymin:BYTE; _wnsync

           :INTEGER; _wnres(7):BYTE; _wnmen:INTEGER
Ø14E      DIM WndScr:wnstr
Ø157
Ø158      (* Now we set up our intercept code
Ø17B      TYPE IntCeptCod=StBCode:BYTE; IntAddr:INTEGER; RTICode,IntResult

           :BYTE
Ø196      DIM IceptCode:IntCeptCod
Ø19F
Ø1AØ      IceptCode.StBCode:=$F7
Ø1AC      IceptCode.IntAddr:=ADDR(IceptCode)+4
Ø1BD      IceptCode.RTICode:=$3B
Ø1C9
Ø1CA      (* We must also define a data type to hold the 68Ø9 registers
Ø2Ø7      TYPE Registers=cc,a,b,dp:BYTE; x,y,u:INTEGER
Ø22C      DIM Regs:Registers
Ø235
Ø236      (* We must also tell our program what the mouse looks like.
Ø271      TYPE rodent=valid,actv,totm:BYTE; rsrvØ:INTEGER; ttto:BYTE; tsst

           :INTEGER; cbsa,cbsb,ccta,cctb,ttsa,ttsb,tlsa,tlsb:BYTE

           ; rsrvl,bdx,bdy:INTEGER; stat,res:BYTE; acx,acy,wrx,wry

           :INTEGER
Ø2E2      DIM msret:rodent
Ø2EB
Ø2EC      (* To enhance readability
Ø3Ø5
Ø3Ø6      DIM Menu_ID,Menu_Item:INTEGER
Ø311      DIM DoMenuItem,IgnoreMenu,DoContent:BOOLEAN
Ø32Ø      DIM F_Icpt,F_Sleep:BYTE
Ø32B      DIM I_Getstt,SS_MnSel,I_Dup:BYTE
Ø33A      DIM I_SetStt,SS_MsSig,StdIn,StdOut,SS_GIP,SS_Mouse:BYTE
Ø355      DIM thePath,MouseSig,Follow,HorPos:INTEGER
Ø368      DIM Grp_Ptr,Ptr_Arr:BYTE
Ø373      DIM oldpath(3),newpath:BYTE
Ø383      DIM action:STRING
Ø38A
Ø38B      DoMenuItem:=FALSE \DoContent:=FALSE \IgnoreMenu:=FALSE
Ø39D      Grp_Ptr:=2Ø2 \Ptr_Arr:=1 \F_Icpt:=$Ø9
Ø3B3      F_Sleep:=$ØA \I_Getstt:=$8D \I_SetStt:=$8E
Ø3CB      SS_MsSig:=$8A \SS_MnSel:=$87 \SS_GIP:=$94
Ø3E3      SS_Mouse:=$89 \Follow:=1 \StdIn:=Ø
Ø3F9      StdOut:=1 \MouseSig:=1Ø
Ø4Ø7      I_Dup:=$82
Ø4ØF
Ø41Ø      DIM EndStr:STRING[1]
Ø41C      DIM Null,CallCode,FunCode:BYTE
Ø42B      Null:=Ø
Ø432      EndStr:=CHR$(Null)
Ø43B
Ø43C      (* Window type defs.
Ø45Ø      DIM WT_NBox,WT_FWin,WT_FSWin,WT_SBox,WT_DBox,WT_PBpox:INTEGER
Ø46B      WT_NBox:=Ø \WT_FWin:=1 \WT_FSWin:=2
Ø48Ø      WT_SBox:=3 \WT_DBox:=4 \WT_PBox:=5
Ø496
Ø497      DIM MNEnbl,MNDsbl:BYTE
Ø4A2      MNEnbl:=1 \MNDsbl:=Null
Ø4B1
Ø4B2      DIM WINSync:INTEGER
Ø4B9      WINSync:=$CØCØ
Ø4C1
Ø4C2      DIM MN_Move,MN_Clos,MN_Grow,MN_Uscrl,MN_Dscrl,MN_Rscrl,MN_Lscrl

           :BYTE
Ø4E1      DIM MN_Tndy,MN_File,MN_Edit,MN_Styl,MN_Font,MN_Char:BYTE
Ø4FC      MN_Move:=1 \MN_Clos:=2 \MN_Grow:=3 \MN_Uscrl:=4
Ø518      MN_Dscrl:=5 \MN_Rscrl:=6 \MN_Lscrl:=7
Ø52D      MN_Tndy:=2Ø \MN_File:=21 \MN_Edit:=22
Ø542      MN_Styl:=23 \MN_Font:=24 \MN_Char:=8
Ø557
Ø558      (* Here are some more definitions you'll need in almost all of your
Ø59B      (* BasicØ9 / Multi-Vue application programs.  This group takes care
Ø5DE      (* of the many buffers used within OS-9 Level II.
Ø6ØF
Ø61Ø      DIM Grp_Font,Grp_Clip,Grp_Pat2,Grp_Pat4,Grp_Pat6:BYTE
Ø627      DIM Fnt_S8x8,Fnt_S6x8,Fnt_G8x8:BYTE
Ø636      DIM Ptr_Pen,Ptr_Lch,Ptr_Slp,Ptr_Ill,Ptr_Txt,Ptr_Sch:BYTE
Ø651      DIM WR_Cntnt,WR_Cntrl,WR_OfWin:BYTE
```

tain your main program *with* the module entry point. It must be assembled with a non-zero type/language code. Modules that you plan to link with this first module must have the type/language byte set to zero. Any location in your modules that you want to reference from another module must have a label ending with a colon. Thus, any variable name that ends with a colon will be recognized globally when you run your linker.

**Procedure Files**

I was happy to hear about Gil Shattuck's File Transfer Utilities at RAINBOWfest Chicago. I was even happier when I received a copy of Gil's latest version, based on *Multi-Vue*. However, I was delighted when I put the disk in Drive `/d0` and clicked on the *Multi-Vue* icon.

There were two procedure files on the disk from Granite Computer Systems, so I pointed to the first with the mouse and clicked to select it. I moved the pointer to the File menu and listed the file. It was an installation file. One of the procedure files Shattuck provides loads `FTU` from the GCS master disk to your system disk in Drive `/d0`. The other procedure copies the files to the disk in Drive `/h0`. I use `/h0` and *GShell+* from the OS-9 Users Group, so I clicked on the second procedure file's icon and returned to the keyboard to write a few more sentences. While I worked, *GShell+* ran the procedure file. In a few minutes, Shattuck's `FTU` was installed.

The procedure file supplied by GCS moved the file, `AIF.ftu`, to my `CMDS` directory. When it had finished, I copied that file to the directory where I group my `AIF` files. I then clicked on the update bar (located just below the *Multi-Vue* menu bar) and, like magic, the `FTU` icon appeared on my screen. (I capitalize the letters "AIF" in my file names and use the *GShell+* sort routine so that the icons used with my most frequently run programs are placed at the top of the screen and sorted in alphabetical order. My CoCo 3 is turning into a dream computer.)

As soon as the `FTU` icon appeared, I clicked it on. A new screen with a pleasant border color and a standard *Multi-Vue* framed window with a five-item menu bar appeared on the screen. The standard Close box appears to the left of the menu, followed by a Quit menu that lets you exit `FTU` immediately. Three menus unique to `FTU` appeared to the right. These are PC

Transfer, RS-DOS *Transfer* and FLEX Transfer. I took an old FLEX disk and an MS-DOS disk and tried the different menus.

You may notice that I haven't mentioned the manual. That's because I haven't read at it yet. I like to try software before I read the manual. The FTU manual is clear, complete, concise and quite useful. My only problem occurred because I had booted my CoCo 3 with an OS9Boot file containing CC3Disk instead of SDisk3, and GCS FTU requires Dan Johnson's SDisk3 package.

Shattuck has put a lot of thought into this utility package. For example, if you put a new FLEX, PC or Disk BASIC disk in Drive /d0 and click on the appropriate menu title in the pull-down menu, a list of the files on that disk will appear instantly on your CoCo 3 screen. You can even ask for an extended directory listing that gives you the size and age of the files you might want to transfer.

One of the best features of this utility occurs when you are ready to read one of these foreign files. You just click on the proper menu title, move the pointer down and click on the "Read File" selection. FTU immediately presents a dialog box in the lower right hand corner of your screen, so you can type in any additional information it might need. Never fear, you won't need to remember a filename — or the file's extension — with this program. GCS leaves the directory listing on the screen so you can refer to it while you type the name of the file you want to transfer. The small dialog box doesn't get in the way at all. Nice job, Gil!

**Speaking of File Transfers . . .**

Recently, Jane C. Sherratt of Omaha, Neb., who uses *VIP Database* and *VIP Calc* packages and has many ASCII files, wrote to ask how she could read these files into an OS-9 word processing package to avoid retyping all the numbers. Sherratt can use a package like GCS's File Transfer Utilities to move the files from her Disk BASIC disks to an OS-9 disk. Once she has the files stored on an OS-9 disk, she should be able to open them with most OS-9 editors and word processors. Many of them recognize tabs, so the formatting from her spreadsheets should stay intact. She may even be able to load the ASCII data from *VIP Calc* into *DynaCalc*.

Even straightforward BASIC programs — those that do not use commands unique to Color Computer

```
Ø66Ø    DIM Pat_Sld,Pat_Dot,Pat_Vrt,Pat_Hrz,Pat_Xhtc,Pat_Lsnt:BYTE
Ø67B    DIM Pat_Rsnt,Pat_Sdot,Pat_Bdot:BYTE
Ø68A
Ø68B    (* First, the Buffer Numbers
Ø6A7    Grp_Font:=2ØØ \Grp_Clip:=2Ø1 \Grp_Ptr:=2Ø2
Ø6BC    Grp_Pat2:=2Ø3 \Grp_Pat4:=2Ø4 \Grp_Pat6:=2Ø5
Ø6D1
Ø6D2    (* The Font Buffers
Ø6E5    Fnt_S8x8:=1 \Fnt_S6x8:=2 \Fnt_G8x8:=3
Ø6FA
Ø6FB    (* The Mouse Pointer Buffers
Ø717    Ptr_Arr:=1 \Ptr_Pen:=2 \Ptr_Lch:=3 \Ptr_Slp:=4
Ø733    Ptr_Ill:=5 \Ptr_Txt:=6 \Ptr_Sch:=7
Ø748
Ø749    (* The Window regions for the Mouse
Ø76C    WR_Cntnt:=Ø \WR_Cntrl:=1 \WR_OfWin:=2
Ø781
Ø782    (* The Pattern Buffers
Ø798    Pat_Sld:=Ø \Pat_Dot:=1 \Pat_Vrt:=2 \Pat_Hrz:=3 \Pat_Xhtc:=4
Ø7BB    Pat_Lsnt:=5 \Pat_Rsnt:=6 \Pat_Sdot:=7 \Pat_Bdot:=8
Ø7D7
Ø7D8    DIM _update,wxmin,wymin,timout,cur_wind,moussig,miscsig,wait

         :BYTE
Ø7FB    DIM sigcode,status,wpath:INTEGER
Ø8ØA
Ø8ØB    wxmin:=4Ø \(* minimum screen width for our window
Ø838    wymin:=24 \(* minimum screen height
Ø857
Ø858    _update:=3 \(* update rate for the mouse
Ø87B    timout:=1Ø \(* timeout between clicks
Ø89B    Follow:=1 \(* update cursor when mouse moves, Ø for no follow.
Ø8D5
Ø8D6    cur_wind:=Ø \(* flag to fork a process on current window
Ø9Ø8    moussig:=1Ø \(* signal code returned by the mouse when
Ø938    miscsig:=15 \(* miscellaneous signal code
Ø95B    wait:=2Ø \(* signal code to wait for button to be pressed
Ø991
Ø992    (* After we define -- or "type" -- the special data structures
Ø9DØ    (* we need for a Multi-Vue based program, we must initialize
ØA9C    (* the data in those structures.
ØA2C
ØA2D    DIM _tanitms(9):Mistr
ØA3B    _tanitms(1)._mnttl:="Calc"+EndStr \_tanitms(1)._mienbl:=MNEnbl
ØA5E    _tanitms(2)._mnttl:="Clock"+EndStr \_tanitms(2)._mienbl:=MNEnbl
ØA82    _tanitms(3)._mnttl:="Calendar"+EndStr \_tanitms(3)._mienbl:=MNEnbl
ØAA9    _tanitms(4)._mnttl:="Control"+EndStr \_tanitms(4)._mienbl:=MNEnbl
ØACF    _tanitms(5)._mnttl:="Printer"+EndStr \_tanitms(5)._mienbl:=MNEnbl
ØAF5    _tanitms(6)._mnttl:="Port"+EndStr \_tanitms(6)._mienbl:=MNEnbl
ØB18    _tanitms(7)._mnttl:="Help"+EndStr \_tanitms(7)._mienbl:=MNDsbl
ØB3B    _tanitms(8)._mnttl:="Shell"+EndStr \_tanitms(8)._mienbl:=MNEnbl
ØB5F    _tanitms(9)._mnttl:="Clipboard"+EndStr \_tanitms(9)._mienbl

         :=MNDsbl
ØB87
ØB88    DIM _filitms(6):Mistr
ØB96    _filitms(1)._mnttl:="New"+EndStr \_filitms(1)._mienbl:=MNDsbl
ØBB8    _filitms(2)._mnttl:="Open"+EndStr \_filitms(2)._mienbl:=MNDsbl
ØBDB    _filitms(3)._mnttl:="Save"+EndStr \_filitms(3)._mienbl:=MNDsbl
ØBFE    _filitms(4)._mnttl:="Abandon"+EndStr \_filitms(4)._mienbl:=MNDsbl
ØC24    _filitms(5)._mnttl:="Print"+EndStr \_filitms(5)._mienbl:=MNDsbl
ØC48    _filitms(6)._mnttl:="Quit"+EndStr \_filitms(6)._mienbl:=MNEnbl
ØC6B
ØC6C    DIM _editms(6):Mistr
ØC7A    _editms(1)._mnttl:="Undo"+EndStr \_editms(1)._mienbl:=MNDsbl
ØC9D    _editms(2)._mnttl:="Cut"+EndStr \_editms(2)._mienbl:=MNDsbl
ØCBF    _editms(3)._mnttl:="Copy"+EndStr \_editms(3)._mienbl:=MNDsbl
ØCE2    _editms(4)._mnttl:="Paste"+EndStr \_editms(4)._mienbl:=MNDsbl
ØD Ø6   _editms(5)._mnttl:="Clear"+EndStr \_editms(5)._mienbl:=MNEnbl
ØD2A    _editms(6)._mnttl:="Show"+EndStr \_editms(6)._mienbl:=MNDsbl
ØD4D
ØD4E    (* Now we'll set up the entire menu
ØD71
ØD72    DIM Tndy_Mn:mnstr
ØD7B    Tndy_Mn._mittl:="Tandy"+EndStr \Tndy_Mn._mnid:=MN_Tndy
ØD9B    Tndy_Mn._mnxsiz:=1Ø \Tndy_Mn._mnnits:=9
ØDB1    Tndy_Mn._mnenabl:=MNEnbl \Tndy_Mn._mnitems:=ADDR(_tanitms)
ØDCB
ØDCC    DIM File_Mn:mnstr
ØDD5    File_Mn._mittl:="Files"+EndStr \File_Mn._mnid:=MN_File
ØDF5    File_Mn._mnxsiz:=1Ø \File_Mn._mnnits:=6
ØE ØB   File_Mn._mnenabl:=MNEnbl \File_Mn._mnitems:=ADDR(_filitms)
```

# Sugar Software

**☞ TIMS Combo Special - Save 15% ☜**

Order The Information Management System (TIMS) Combo package described below for only $29.95. This special is good through November 30, 1988.

## CALLIGRAPHER

**CoCo Calligrapher** - Turn your CoCo and dot-matrix printer into a calligrapher's quill. Make beautiful invitations, flyers, certificates, labels and more. Includes 3 fonts: *Gay Nineties, Old English* and *Cartoon.* The letters are ½ inch high and variably spaced. Works with many printers such as Epson, Gemini and Radio Shack. Additional fonts are available (see below). Tape/Disk; **$24.95.**

**OS9 Calligrapher** - Prints all the same fonts as the CoCo Calligrapher. It reads a standard text file which contains text and formatting codes. You may specify the font to use, change fonts at any time, centering, left, right or full justify, line fill, margin, line width, page size, page break and indentation. Similar to *troff* on UNIX systems. Includes the same 3 fonts and additional fonts are available (see below). Disk only; OS9 Level I or II; **$24.95.**

**Calligrapher Fonts** - Requires Calligrapher above. Each set on tape or disk; specify RSDOS or OS9 version; **$14.95** each. **Set #1** (9 fonts) Reduced and reversed versions of Gay Nineties, Old English and Cartoon; **Set #2** (8 fonts) Old Style and Broadway; **Set #3** (8 fonts) Antique and Business; **Set #4** (8 fonts) Wild West and Checkers; **Set #5** (10 fonts) Stars, Hebrew and Victorian; **Set #6** (8 fonts) Block and Computer; **Set #7** (5 *small* fonts) Roman, Italics, Cubes, Digital and Old World. ☞ **NEW: Set #10** (8 fonts) several Roman styles; **Set #11** (10 fonts) Gothic and Script; **Set #12** (10 fonts) more Roman and Italic.

**Economy Font Packages** on disk; specify RSDOS or OS9; **29.95** each or **$59.95** for all three: **Font Package #1** - Above font sets 1, 2 and 3 (25 fonts). **Font Package #2** - Above font sets 4, 5 and 6 (26 fonts). **Font Package #4** (also known as the *Hershey* fonts) - Above font sets 10, 11 and 12 (28 fonts).

**Calligrapher Combo Package** - Includes the Calligrapher and Economy Font Packages #1 and #2, 54 fonts in all **$69.95**, or **$84.90** to also include Package #4 (82 fonts).

**Sample Calligrapher Hershey Fonts**

*The CoCo Calligrapher!*

**NEW! OS9 Font Massager** - This OS9 utility program allows you to do all sorts of things to Calligrapher font files. You may create new fonts, modify existing fonts, invert fonts, compress fonts, double the height and/or width, halve the height and/or width and convert between OS9 and RSDOS formats. **$19.95** (or only **$14.95** if ordered with any other *Calligrapher* item). A listing of the C source code for the Font Massager is available for an additional **$14.95.**

## INFORMATION MGT.

**TIMS (The Information Management System)** - Tape or disk, fast and simple general data base program. Create *files* of *records* that can be quickly sorted, searched, deleted and updated. Powerful printer formatting. Up to 8 *user* fields, sort on up to 3 fields. Tape/Disk; **$19.95.**

**TIMS Mail** - Tape or Disk based mailing list management program. Files are compatible with TIMS. Fast and simple to use. Supports labels 1, 2 or 3 across, 2½ to 4 inches wide. Tape/Disk; **$19.95.**

**TIMS Utility** - Utility companion for TIMS and TIMS Mail for multi-term search (*AND* and *OR* logic), global change and delete, split large files and more! Tape/Disk; **$14.95.**

**TIMS Combo Package** - All three of the above programs: TIMS, TIMS Mail and TIMS Utility on one disk - **$34.95.**

## EDUCATIONAL

**Trig Attack** - Ages 9 and up. An educational arcade game where players learn important math concepts as they play. Sound effects, colorful graphics. Excellent manual includes an introduction to trigonometry. Tape/Disk; **$19.95.**

**The Educational Combo** - The Combo includes these educational (and entertaining) games:
**Silly Syntax** (ages 5 and up) story creation game with 2 stories
**Galactic Hangman** (ages 7 and up) animated graphics, with a 700 word vocabulary
**The Presidents of the USA** (ages 10 and up) a presidential trivia game
**The Great USA** (ages 9 and up) a trivia game of the states
**Trig Attack** (ages 9 and up) Zap those *Trigs*

All five programs on one disk; **$49.95** (save $50!).

## SPECIAL INTEREST

**Rental Property Income** and Expense Management Package - Maintain rental property income and expense records and print reports. 28 expense categories. *This program may be tax deductible.* Disk only; **$29.95.**

**CoCo Knitter** - Easy to use program to display or print instructions to knit a sweater: Cardigan or Pullover; Round or V-neck; Raglan or Set-in Sleeve; 3 weights of yarn; 8 sizes from baby to man. Tape/Disk; **$19.95.**

RAINBOW CERTIFICATION SEAL

MasterCard VISA

*TRS-80 is a trademark of Tandy Corp.


**SUGAR SOFTWARE**
**P.O. Box 7446**
**Hollywood, Florida 33081**
**(305) 981-1241**


*All programe run on the CoCo 1, 2 and 3, 32K Extended Basic, unless otherwise noted.* Add $1.50 per tape or disk for shipping and handling. Florida residents add 6% sales tax. COD orders add $5. Dealer inquiries invited. Orders generally shipped in 24-48 hours. No refunds or exchanges without prior authorization.

BASIC — can be transferred over to an OS-9 file and run with BASIC09. To do this, make sure that you save the source code of your Disk BASIC file in ASCII. Before you attempt to load the file into BASIC09, however, use your favorite editor to insert the line:

```
PROCEDURE nameofprogram
```

at the front of your *Disk* BASIC program. (The 'P' must be the *first* character in the file.)

***"Error 221 means OS-9 couldn't locate the module requested, while Error 249 means the disk inserted in a drive isn't compatible with the drive's present configuration."***

### Getting Started With *Multi-Vue*

Melvin Grow in Alameda, Calif., wrote to ask for help in starting *Multi-Vue*. In its present format, he can't access his files in Drive 1. Having transferred all his OS-9 files to a 40-track disk, Grow finds *Multi-Vue* unfriendly, and wonders why Tandy used BuildMV instead of *Config* so that users could match their hardware configuration.

Grow reported receiving the infamous 221 and 249 errors. Let's look at those first. Error 221 means that OS-9 could not locate the module requested. Error 249 means that the disk inserted in a drive is not compatible with the present configuration of the drive (i.e., you would get Error 249 if you inserted a double-sided disk in a drive with its device descriptor configured for single-sided disks. My hardware setup is also a hybrid and would not work with BuildMV. When I couldn't run BuildMV the first time, I just installed *Multi-Vue* myself. Grow may also find this approach simpler. To see if we can solve his problem, however, let's look at BuildMV.

To begin, the procedure file saves most of the modules that it expects in your OS-9 Level II boot file to a MODULES directory. This directory is on the reverse side of the *Multi-Vue* release disk from Tandy. Mount this disk in Drive /d0.

```
ØE25
ØE26      DIM Edit_Mn:mnstr
ØE2F      Edit_Mn._mittl:="Edit"+EndStr \Edit_Mn._mnid:=MN_Edit
ØE4E      Edit_Mn._mnxsiz:=1Ø \Edit_Mn._mnnits:=6
ØE64      Edit_Mn._mnenabl:=MNEnbl \Edit_Mn._mnitems:=ADDR(_editms)
ØE7E
ØE7F      (* Now that we have defined the items in the menu and the menu itself,
ØEC5      (* we can define the window that we want the menu to appear in.
ØFØ4
ØFØ5      DIM Menus(3):mnstr
ØF13
ØF14      Menus(1):=Tndy_Mn \Menus(2):=File_Mn \Menus(3):=Edit_Mn
ØF35
ØF36      WndScr._wnttl:="KISSDraw"+EndStr \WndScr._nmens:=3
ØF58      WndScr._wxmin:=8Ø \WndScr._wymin:=24
ØF6E
ØF6F      (* _wnres, an array of seven reserved bytes, sits here
ØFA5      WndScr._wnsync:=WINSync \WndScr._wnmen:=ADDR(Menus)
ØFBF
ØFCØ      (* Let's create a window
ØFD8
ØFD9      RUN Gfx2(StdOut,"CurOff")
ØFEC      RUN gfx3(StdOut,"ss.wnset",ADDR(WndScr),WT_FSWin)
1ØØC      RUN gfx3(StdIn,"ss.gip",$Ø1Ø1,$FFFF)
1Ø27      RUN gfx3(StdIn,"ss.mous",$Ø3Ø1,Follow)
1Ø44
1Ø45      (* Now we can the call to set up the intercept.
1Ø74
1Ø75      CallCode:=F_Icpt
1Ø7D      Regs.x:=ADDR(IceptCode)
1Ø8B      Regs.u:=ADDR(IceptCode)+4
1Ø9C      RUN SysCall(CallCode,Regs)
1ØAB
1ØAC      RUN Gfx2("gcset",Grp_Ptr,Ptr_Arr)
1ØC3
1ØC4      (* The main loop of our program starts here
1ØEF
1ØFØ      LOOP  \(* Do this forever
11Ø4
11Ø5        PRINT
11Ø7        PRINT "Type <Control E> or <BREAK> to stop !!!"
1132
1133        IceptCode.IntResult:=Ø \(* Initialize Signal Report
1159        RUN gfx3(StdIn,"ss.msig",MouseSig)
1172
1173        (* Now we must tell the process to go to sleep until
11A7        (* it receives a signal to wake up.
11CA
11CB        CallCode:=F_Sleep
11D3        Regs.x:=Ø \(* Sleep forever -- at least till signal
12Ø6        RUN SysCall(CallCode,Regs)
1215
1216      EXITIF IceptCode.IntResult=2 THEN  \(* Escape with BREAK key
123D      ENDEXIT
1241
1242        IF IceptCode.IntResult=MouseSig THEN
1252          RUN gfx3(StdIn,"gs.mous",ADDR(msret)) \(* Go Read Mouse
127C          IF msret.stat=WR_Cntrl AND msret.cbsa<>Ø THEN
1296            DoMenuItem:=TRUE
129C          ELSE
12AØ            DoMenuItem:=FALSE
12A6          ENDIF
12A8        ENDIF
12AA
12AB        IF DoMenuItem=TRUE THEN
12B6          RUN gfx3(StdIn,"ss.mnsel",Menu_ID,Menu_Item)
12D5          PRINT "The Menu ID is "; Menu_ID
12EC          PRINT "The Menu Item is "; Menu_Item
13Ø5
13Ø6          IF Menu_ID<>Ø THEN
1312            GOSUB 1ØØØ \(* Go handle menus
1328          ENDIF
132A        ENDIF
132C
132D      ENDLOOP
1331
1332      (* Your Program code that deals with events
135D      (* in the content region of the window goes here.
138E
```

```
138F      END
1391
1392 1ØØØ IF Menu_ID=MN_Clos OR Menu_ID=MN_File AND Menu_Item=6 THEN
13B1        action:="Alert"
13BD        RUN DoAlert(action,"Quit Demo? ","Yes    ","","No    ",ADDR

             (WndScr))
13F1        IF LEFT$(action,3)="Yes" THEN
1403          PRINT "Thank you for trying DoMenu"
1422          GOTO 9999
1426        ENDIF
1428      ELSE
142C        IF Menu_ID=MN_Tndy THEN
1439          RUN Gfx2("gcset",Grp_Ptr,Ptr_Arr)
145Ø          RUN Gfx2("curoff")
145E          ON Menu_Item GOSUB 111Ø,112Ø,113Ø,114Ø,115Ø,116Ø,117Ø,118Ø

               ,119Ø
1489        ELSE
148D          IF Menu_ID=MN_Edit AND Menu_Item=5 THEN
14A1            PRINT CHR$($ØC);  \(* Clear Screen
14B7          ENDIF
14B9        ENDIF
14BB      ENDIF
14BD      RETURN
14BF
14CØ 111Ø (* Calc
14CA      RUN Gfx2("OWSet",1,Ø,1,36,12,Ø,1)
14EC      SHELL "gcalc"
14F5      RUN Gfx2("OWEnd")
15Ø2      RETURN
15Ø4
15Ø5 112Ø (* Clock
151Ø      RUN Gfx2("OWSet",1,Ø,1,3Ø,12,Ø,1)
1532      GOSUB 2ØØØ \(* Draw nice looking box
154E      SHELL "gclock"
1558      GOSUB 3ØØØ \(* Close box
1568      RETURN
156A
156B 113Ø (* Calendar
1579      (* To run this desk accessory, you must dup the old standard
15B5      (* paths, close them, and dup new windowpath into them.  After
15F3      (* you run gcal, you must restore the old paths
1622
1623      BASE Ø
1625      OPEN #newpath,"/w"
163Ø      RUN Gfx2(newpath,"DWSet",6,Ø,Ø,4Ø,24,Ø,1,2)
165A      PRINT #newpath,CHR$($1B); CHR$($21);  \(* select the window
167F      FOR thePath=Ø TO 2
168F        Regs.a:=thePath
169B        RUN SysCall(I_Dup,Regs)
16AA        oldpath(thePath):=Regs.a
16B9        CLOSE #thePath
16BF        Regs.a:=newpath
16CB        RUN SysCall(I_Dup,Regs)
16DA      NEXT thePath
16E5
16E6      SHELL "gcal"
16EE
16EF      FOR thePath=Ø TO 2
16FF        CLOSE #thePath
17Ø5        Regs.a:=oldpath(thePath)
1714        RUN SysCall(I_Dup,Regs)
1723        CLOSE #oldpath(thePath)
172C      NEXT thePath
1737      PRINT #Ø,CHR$($1B); CHR$($21);  \(* re-select standard paths
1762      CLOSE #newpath
1768      BASE 1
176A      RETURN
176C
176D 114Ø (* Control
177A      GOSUB 4ØØØ \(* Go open overlay window
1797      SHELL "Control"
17A2      GOSUB 3ØØØ \(* Close overlay window
17BD      RETURN
17BF
17CØ 115Ø (* Print
17CB      GOSUB 4ØØØ \(* Open overlay window
17E5      SHELL "gprint"
17EF      GOSUB 3ØØØ \(* Close overlay window
```

Next, BuildMV prompts you to copy the modules term.wind.dt and CC3go from the MODULES directory on your OS-9 *Config* disk to the MODULES directory on the reverse side of the *Multi-Vue* release disk. When this is complete, BuildMV copies the GrfDrv file from your original OS-9 system disk to the CMDS directory on the reverse side of the *Multi-Vue* release disk.

After it moves the files, BuildMV changes its current data directory to the MODULES directory and runs the OS9Gen utility to create a new OS9Boot file.

The procedure file is complicated by several factors. First, BuildMV expects you to copy to a single disk, using only Drive /d0. Second, it expects to find the needed modules in your OS9Boot file. If you have a hybrid system, this may not be the case, and you will receive the Error 221 message.

Evidently, Grow also received an Error 249 message when he tried to copy the files from his double-sided disk, which the procedure file had instructed him to mount in Drive /d0. Since *Multi-Vue* instructed him to boot with his original OS-9 system disk, he was running a single-sided device descriptor in Drive /d0 that could not read the double-sided disk containing the files. Therefore, he received an Error 249.

I will now attempt to make *Multi-Vue*'s installation process easier to understand. Start by listing the MODULES and CMDS directories on the reverse side of the *Multi-Vue* release disk (the side the instructions tell you to use). In the MODULES directory you'll find a HELP directory, a WindInt.io module, eight new window device descriptors and a file named Bootlist.mv.

Because you use the bootlist file to tell OS9Gen which modules you want in your new OS9Boot file, we'll need to look at that file as well. When Bootlist.mv is listed, it will instruct OS9Gen to use the files that BuildMV attempted to save for you, as well as the modules on the reverse side of the *Multi-Vue* release disk, in the MODULES directory.

You will need to copy the CC3go module from the MODULES directory on your *Config* disk because the copy in memory is marked busy and cannot be saved with the OS-9 save command. If you try, you will receive an Error 209, or "Module Busy," message. Copy term-wind.dt from the *Config* disk as well because it does not exist in the OS9Boot file of the standard OS-9 Level II release disk, which BuildMV expects you to use.

After looking at this procedure, you may feel that things should not be this complicated. They aren't. To run *Multi-Vue* you only need to remove the Grfint module from the OS9Boot file and replace it with the WindInt.io module that comes with *Multi-Vue*, add the Term-wind.dt window device descriptor and the new window device descriptors /w8 through /w12 to the OS9Boot file, and keep the modules already in the OS9Boot file that work

***"After you save the modules from your own OS9-Boot file, copy the new module files from the MODULES directory on the reverse side of the Multi-Vue release disk to the directory on your freshly formatted disk."***

with your hardware. In other words, start by formatting a fresh disk. Create a MODULES directory on this disk with the OS-9 makdir utility, and save all the modules in your present OS9Boot file, except grfdrv, in the MODULES directory. Next, either create a procedure file of Save command lines (like those in BuildMV) with the build utility or your favorite editor, or just copy them one at a time from the keyboard.

After you save the modules from your own OS9Boot file, copy the new module files from the MODULES directory on the reverse side of the *Multi-Vue* release disk to the directory on your freshly formatted disk. Again, you can either create a procedure file to do this for you, or copy them one by one from the keyboard. Do whatever is easier for you. You must also copy the Term-wind.dt and CC3go modules to your MODULES directory.

Next, create a Bootlist.mv file in that directory, using either the build utility or your editor. That bootlist should include both the names of each module you saved earlier and the modules copied from the *Multi-Vue* release disk and the OS-9 *Config* disk.

Now run OS9Gen and create your new OS9Boot file. If you mounted your new disk in Drive /d1 and are running from an execution directory in a disk

```
18ØA        RETURN
18ØC
18ØD 116Ø (* Port
1817        GOSUB 4ØØØ \(* Open Overlay
182A        SHELL "gport"
1833        RUN Gfx2("OWEnd")
184Ø        RETURN
1842
1843 117Ø (* Help
184D        RETURN
184F
185Ø 118Ø (* Shell
185B        RUN Gfx2("GCSet",Ø,Ø) \(* Turn graphic cursor off
1888        RUN Gfx2("OWSet",1,1,8,72,12,1,Ø) \(* Create Overlay Window
18C2        RUN Gfx2("CurOff")
18DØ        RUN gfx3(StdOut,"ss.wnset",ADDR(WndScr),WT_DBox) \(* Make Window
18FE        RUN Gfx2("CurOn")
19ØB        RUN Gfx2("Color",1)
191B        SHELL ""
191F        RUN Gfx2("OWEnd")
192C        RUN Gfx2("GCSet",Grp_Ptr,Ptr_Arr)
1943        RETURN
1945
1946 119Ø (* Clipboard
1955        RETURN
1957
1958 2ØØØ (* Dress up the opening box
1976        RUN Gfx2("Logic","XOR")
1989        RUN Gfx2("Color",1)
1999        HorPos:=1Ø
19AØ        REPEAT
19A2          RUN Gfx2("Box",32Ø-HorPos,96-HorPos/4,32Ø+HorPos,96+HorPos
               /4)
19D1          RUN Gfx2("Box",32Ø-HorPos,96-HorPos/4,32Ø+HorPos,96+HorPos
               /4)
1AØØ          HorPos:=HorPos*1.3
1A11        UNTIL HorPos>3ØØ
1A1D        RUN Gfx2("Logic","OFF")
1A3Ø        RUN Gfx2("Color",Ø)
1A4Ø        RETURN
1A42
1A43 3ØØØ (* Close the Box
1A56        RUN Gfx2("Logic","XOR")
1A69        RUN Gfx2("Color",1)
1A79        HorPos:=3ØØ
1A81        REPEAT
1A83          RUN Gfx2("Box",32Ø-HorPos,96-HorPos/4,32Ø+HorPos,96+HorPos
               /4)
1AB2          RUN Gfx2("Box",32Ø-HorPos,96-HorPos/4,32Ø+HorPos,96+HorPos
               /4)
1AE1          HorPos:=HorPos/1.5
1AF2        UNTIL HorPos<1Ø
1AFD        RUN Gfx2("Logic","Off")
1B1Ø        RUN Gfx2("Color",Ø)
1B2Ø        RUN Gfx2("OWEnd")
1B2D        RETURN
1B2F
1B3Ø 4ØØØ (* Make Overlay Window for Tandy Desk Acessories
1B63        RUN Gfx2("OWSet",1,Ø,Ø,38,21,Ø,1)
1B85        GOSUB 2ØØØ \(* Make the open flashy
1BAØ        RUN Gfx2("Box",Ø,Ø,639,191)
1BB8        RUN Gfx2("CurXY",1,2)
1BCB        PRINT "Please wait ... getting desk accesory from disk."
1BFF        RETURN
1CØ1
1CØ2 9999 (* Always turn off graphics cursor before leaving program
1C3E        RUN Gfx2("gcset",Ø,Ø)
1C51        END
1C53
```

**Listing 4:** DoAlert

```
PROCEDURE DoAlert
 ØØØØ       (* display Alert boxes and get response for DoMenu
 ØØ32       PARAM action,query,msg1,msg2,msg3:STRING
 ØØ49       PARAM WindowAddr:INTEGER
```

```
0050
0051      DIM button1,button2,button3:STRING
0060      DIM F_Sleep,CallCode,StdIn,StdOut:BYTE
0073      DIM WT_DBox:INTEGER
007A      DIM MouseSig,HorP,VerP:INTEGER
0089
008A      TYPE rodent=valid,actv,totm:BYTE; rsrv0:INTEGER; ttto:BYTE; tsst

           :INTEGER; cbsa,cbsb,ccta,cctb,ttsa,ttsb,tlsa,tlsb:BYTE

           ; rsrv1,bdx,bdy:INTEGER; stat,res:BYTE; acx,acy,wrx,wry

           :INTEGER
00FB      DIM msret:rodent
0104
0105      TYPE Registers=cc,a,b,dp:BYTE; x,y,u:INTEGER
012A      DIM Regs:Registers
0133
0134      TYPE IntCeptCod=StBCode:BYTE; IntAddr:INTEGER; RTICode,IntResult

           :BYTE
014F      DIM IceptCode:IntCeptCod
0158
0159      IceptCode.StBCode:=$F7
0165      IceptCode.IntAddr:=ADDR(IceptCode)+4
0176      IceptCode.RTICode:=$3B
0182
0183      StdIn:=0 \StdOut:=1 \F_Sleep:=$0A \WT_DBox:=4 \MouseSig:=10
01A7
01A8      RUN gfx2("OWSet",1,3,4,28,6,2,3)
01CA      RUN gfx2("CurOff")
01D8      RUN gfx3(StdOut,"ss.wnset",WindowAddr,WT_DBox)
01F7
01F8      IF LEN(query)=0 THEN query:="What is your choice? "
0220      ENDIF
0222
0223      PRINT query \ PRINT
022A      button1:=msg1 \button2:=msg2 \button3:=msg3
0242
0243      WHILE LEN(button1)<8 DO
0250        button1:="   "+button1
025E      ENDWHILE
0262
0263      WHILE LEN(button2)<8 DO
0270        button2:="   "+button2
027E      ENDWHILE
0282
0283      WHILE LEN(button3)<8 DO
0290        button3:="   "+button3
029E      ENDWHILE
02A2
02A3      PRINT button1; button2; button3;
02B1
02B2      IF button1<>"          " THEN
02C8        RUN gfx2("Box",20,80,208,160)
02DF      ENDIF
02E1
02E2      IF LEFT$(button2,8)<>"        " THEN
02F9        RUN gfx2("Box",220,80,405,160)
0311      ENDIF
0313
0314      RUN gfx2("Box",420,80,605,160) \RUN gfx2("Box",430,85,595,155

           )
0346
0347      RUN gfx3(StdIn,"ss.msig",MouseSig) \(* Set Mouse Signal
0373
0374      CallCode:=F_Sleep
037C      Regs.x:=0 \(* Sleep until mouse is clicked
03A6      RUN SysCall(CallCode,Regs)
03B5
03B6      RUN gfx3(StdIn,"gs.mous",ADDR(msret))
03D0
03D1      HorP:=msret.acx
03DC      VerP:=msret.acy
03E7
03E8      HorP:=HorP*80/18
03F6      VerP:=VerP*24/4
0404
0405      action:="No"
040E
040F      IF msret.stat=0 AND VerP>192/6*3 THEN
```

mounted in Drive /d0, just type the following command line and enter to finish the job:

```
os9gen /d1 <bootlist.mv
```

When OS9Gen finishes, you'll have a new OS9Boot. Now, create a CMDS directory on your new disk and copy the Shell and GrfDrv files from the CMDS directory on the disk you had been using. If you want to run *Multi-Vue* immediately upon startup, add to your new CMDSdirectory the new files supplied in the CMDS directory on the front side of the *Multi-Vue* release disk, along with the AutoEx and MultiStart files from the directory on the back of that disk.

You can also boot up from the disk you just made if both Shell and GrfDrv are on its CMDS directory. You can then remove that disk and mount the system disk you normally use. After you put your old disk in the drive, type the following:

```
chd /d0 and chx /d0/cmds
```

to switch your current directories to it. To run *Multi-Vue* from your disk, copy the new *Multi-Vue* files for the CMDS directories on both sides of the *Multi-Vue* release disk into your own CMDS directory. To start *Multi-Vue* from your disk, just type "multistart".

I hope I've taken some of the mystery out of *Multi-Vue*'s installation process.

**Our Listings**

You'll find the source for ClkSpd and ClkChk, additional code with liberal comments for *MVShell* and another handy utility from Stephen Goldberg in this issue. Goldberg's *Strip* removes any leading or trailing spaces from your text files to save space on your disk. The command lines look like this:

```
strip myfile
strip 8 myfile
strip +30 myfile
strip -10 myfile
```

The first line removes all leading spaces from each line. The second strips eight characters from each line. The next strips all characters past column 30, and the last strips the last 10 characters from each line. *Strip*, another fine example of OS-9 assembly language programming, certainly beats editing each line.

That's it for this month. Until next month, keep on hacking! □

# Frank Hogg Laboratory

*12 Years of Service, Support, and Friendly Help!*

# Christmas SALE

NEW LOWER PRICES!!

## CoCo Burke & Burke Hard Drive Kits

***FLASH!*** *More Burke and Burke systems have been bought in the last six months than other systems have sold in the last* ***3 years, WITH NO RETURNS!!!***

Our first system features the Burke & Burke XT or XT RTC interface. This interface uses popular and inexpensive IBM PC type controllers. For this reason it is the least expensive hard disk system available today. Not as fast as the Isted system but faster than any other system available. It also supports RLL drives. **Note:** Disk Extended Color Basic support and other software options are listed on our price list.

**Disadvantage**; requires a multi-pak.

KIT INCLUDES: Burke & Burke (B&B) XT PC interface. Hard drive with controller, 3 foot ST506 cable set. Hard Drive Case with 60 watt power supply and fan. Includes OS9 LI and LII software. 1 megabyte transfer in 45 seconds! Type ahead under OS9. Complete instructions. Easy one evening assembly.

NEW LOWER PRICES!!

**1 YEAR WARRANTY ON ALL SYSTEMS!**

| | |
|---|---|
| 20 Meg Kit Complete 60MS | *498.00 |
| 30 Meg Kit Complete 60MS RLL | *548.00 |
| 40 Meg Kit Complete 60MS | *618.00 |
| Assemble and test any of the above add | 50.00 |
| OPTIONS: | |
| B&B Real Time Clock (add to above) | 30.00 |
| B&B XT ROM Auto Boot from hard disk | 19.95 |
| B&B Hyper I/O run DECB on hard drive | 29.95 |
| B&B Hyper III Ramdisk/spooler for above | 19.95 |
| FBU Fast Hard disk Back Up | 75.00 |
| R.S.B. RS Disk Basic under OS9 | 39.95 |

### Hard Drive Bits and Pieces

NEW LOWER PRICES!!

| | |
|---|---|
| B&B XT PC style interface | 69.95 |
| B&B XT RTC interface w/clock/calendar | 99.95 |
| (Call for Hard Drive and Kit prices) | |
| FHL HCA/WD High Speed Interface | *99.95 |
| WD 1002-05 High Speed for FHL Interface (Supports both Hard and Floppy drives) (Call for Hard Drive prices) | *196.00 |
| Hard Drive case with 60W P/S and Fan (Can also be used for floppy drives) | *98.00 |

SPECIFICATIONS: size 16" deep, 5.5" high, 7" wide. 60 Watt power supply with 3 drive type power connectors, quiet 12 volt DC fan, LED power indicator, color matches CoCo. Holds 2 1/2 height hard or floppy drives and has card guided space for a PCB the size of a drive (like the WD1002-05 controller)

### Floppy Drives (5.25" and 3.5" FLOPPY DISKS)

**TEAC High Quality Drives - 1 Year Warr.**

| | |
|---|---|
| FD55B 360K 40 Track DS 5.25" | 118.00 |
| FD55F 720K 80 Track DS 5.25: | 151.00 |
| FD35F 720K 80 Track DS 3.5" | 147.00 |

(Bare drives, requires case and power supply $75.00)

## CoCo FHL High Speed Hard Drive Kits

Our top of the line system features Bruce Isted's interface for the Western Digital WD 1002-05 high speed controller. **Features**; fastest system available, 1 megabyte transfer in only 37 seconds!! Twice as fast as other systems! Supports 4 floppy and 3 hard drives, type ahead for **both** floppy and hard disk, **autoboot OS9** L1 or L2 from hard or floppy disk. **Disadvantage**; does not support DECB. This is *the* system of choice for the serious OS9 user.

KIT INCLUDES: FHL HCA/WD High Speed interface, Hard drive with WD 1002-05 controller, ST506 cable set, 4 foot 40 pin cable, Hard Drive Case with 60 watt power supply and **fan**, OS9 software for LI and LII with source, Complete instructions. Easy one evening assembly.

*( INTERFACE SPECIFICATIONS: Size is the same as a floppy controller. Interfaces the WD 1002-05 controller to the CoCo. This controller handles 3 hard and 4 floppy drives. Type ahead under OS9 for both floppy and hard drive. Includes OS9 LI and LII software with source. Autoboot ROM included to boot from floppy or hard drive. Supports OS9 only unless you use R.S.B.. 1 megabyte transfer in 37 seconds!)*

**1 YEAR WARRANTY ON ALL SYSTEMS!**

NEW LOWER PRICES!!

| | |
|---|---|
| 20 Meg High Speed Kit Complete | *699.00 |
| 40 Meg High Speed Kit Complete | *799.00 |
| 70 Meg High Speed Kit Complete | *1235.00 |
| Assemble & Test any of the above add | 60.00 |
| OPTIONS: | |
| Floppy Drive (Mounted in case) | 128.00 |
| Floppy Cable Int & Ext | 25.00 |
| FBU Fast Hard disk Back Up | 75.00 |
| R.S.B. RS Disk Basic Under OS9 | 39.95 |

**ORDERING INFORMATION** VISA and M/C. NY residents add 7% sales tax. US shipping add $3.50 for software. Hardware is more. Please call for Air Express shipping.

**Send for FREE FHL NewsLetter and catalog.**
****Most of our software requires OS9 LII and 512K.**
*** New LOWER PRICES!!!**


Frank Hogg Laboratory, Inc.

770 James Street - Syracuse, NY 13203

Fax 315/474-8225

Call 315/474-7856

# Frank Hogg Laboratory

*12 Years of Service, Support, and Friendly Help!*

# OS9 Software *Christmas* SALE

## The WIZ

by Bill Brady

Did you ever wonder why there is only one really good communications package for OS9? The WIZ is so good that no one has been able to better it in over a year on the market! Simply the best package there is for OS9 and the CoCo III.
FEATURES: Mac-Like interface with windows, text and binary upload/download with xmodem, kermit, on line HELP,
AUTOLOGGING lets you dial up and log on to your favorite service, Macros, VT52 emulation, Usage log and much more.

The Wiz requires a RS232 Pak or similar device, LII and 512K. Supports the Owl-Ware Super I/O board.

**The WIZ** ~~79.95~~

***Christmas* SPECIAL ONLY 59.95**

**Disto RS232 Pak** **49.95**

**See our NEW 2400 Baud Modem for under $200**

## WIZ*Pro*

***By Bill Brady***

NEW PRODUCT!

Read about **WIZ*Pro*** in Dale Puckett's October 1988 column on page 147! We'll have more about **WIZ*Pro*** in coming ads. Available November 1988.

***Christmas* SPECIAL ONLY 99.95**

## Inside OS9 Level II

The Book by Kevin Darling

~~$39.95~~

***Christmas* SPECIAL ONLY 19.95**

Are your tired of playing games with Level II? Do you want to find out what's going on inside OS9? This is the book for you! Over 200 pages of hints, kinks, bugs, source listings and much more. Written by the well known Compuserve SysOp, Kevin Darling. 'Must reading' says Dale Puckett in Rainbow!

## Sculptor Users
## Exciting News is Coming
## Watch For More
## Information!!!!!

NEW PRODUCT!

### Midget 24
### 2400 Baud Modem - 5 Year Warranty

300/1200/2400 baud, Hayes compatible, Non-Volatile Memory (RAM) Automatic Adaptive Equalization (Error Free Transmission) 5 YEAR LIMITED WARRANTY!! Perhaps the last modem you will ever have to buy! (Well... for 5 years anyway!)

***Christmas* SPECIAL ONLY 195.00**

## *DynaStar*

*Used by more OS9 users than any other!*

FEATURES: Best OS9 editor/word processor/text formatter, has everything you would expect and more, supports terminals and windows simultaneously, auto-configurable, auto-indent for C and Pascal programming, mail merge for form letters, bug free, solid. New manual makes it easier to use than ever. Most popular word processor since 1982! Uses CoCo 3's windows for pop-up help menus, can be disabled. Two key sequence to move from anywhere to anywhere in your text. WordStar command style. Will work with files larger than memory. Merge function allows stringing many files together at print time. Full block manipulation, mark, move, copy, delete, read from disk, write to disk. Keyboard Macros: Define or redefine any control key (up to 29) to reproduce any key sequences, including commands! Macros can be read in at startup automatically or created on the fly as needed. Printer Control: Supports multiple printers via a print control file that transforms imbedded control characters to printer control characters. Changing printers is easy. Formatting Commands: Justification, word wrap, centering, headers, footers, macros, odd and even support, multiple index generation, multiple table of contents generation and more! DynaStar is the last word processor you will ever have to buy! Level I version also included on disk.

**DynaStar** word processor/formatter ~~150.00~~

***Christmas* SPECIAL ONLY 99.95**

## DynaSpell

by Dale Puckett

102,000 and 20,000 word dictionaries included. Supports both Level I and II. Fast, slick, the best available for OS9. Written by Rainbowtech columnist Dale Puckett.

**DynaSpell** spelling checker **75.00**
SPECIAL WHEN PURCHASED WITH DYNASTAR **25.00**

**ORDERING INFORMATION** VISA and M/C. NY residents add 7% sales tax. US software shipping add $3.50. Please call for Air Express shipping.

**Send for FREE FHL NewsLetter and catalog.**
****Most of our software requires OS9 LII and 512K.**


Frank Hogg Laboratory, Inc.

770 James Street - Syracuse, NY 13203
Fax 315/474-8225

**Call 315/474-7856**

```
Ø42B        IF HorP<48Ø THEN
Ø438          action:=msgl
Ø44Ø        ENDIF
Ø442      ENDIF
Ø444      RUN gfx2("CurOn")
Ø451      RUN gfx2("OWEnd")
Ø45E      END
Ø46Ø
```

## Listing 5: Strip

```
*******************************************************
*
* STRIP  -  COPYRIGHT (c) 1987 by S.B.GOLDBERG
*
* Strip all leading spaces or indicated number
* of leading or trailing characters from lines
*
* Use: strip [[+/-]count] [filename] [...]
*      no count = strip leading spaces
*      count = strip # leading characters
*      +count = strip characters after # column
*      -count = strip # trailing characters
*      count limits = 1 - 255 characters
*
* Standard output path can be redirected
*
* Omit filename(s) for standard input path to
* use in pipeline or with input redirection
*
         ifpl
         use   /dØ/defs/os9defs
         endc
*
         mod   len,name,prgrm+objct,reent+1,entry,dsiz
*
flag     rmb   1    function flag
path     rmb   1    input path number
count    rmb   2    count storage
pointer  rmb   2    parameter pointer
buffer   rmb   255    I/O line buffer
         rmb   2ØØ    stack
         rmb   2ØØ    parameters
dsiz     equ
*
name     fcs   /Strip/
         fcb   1    edition number
         fcc   /(c)1987 S.B.Goldberg/
*********************************
* CONVERT DECIMAL TO BINARY
*********************************
binary   bsr   convert    convert first digit
         bsr   convert    convert next 2 digits
convert  lda   ,x    get character
         suba  #'Ø    make binary
         bmi   back    not valid digit
         cmpa  #9    valid digit?
         bhi   back    no
         pshs  a    yes, save it
         lda   1+count    get previous total
         ldb   #1Ø    multiply by 1Ø
         mul
         addb  ,s+    add current value
         stb   1+count    save new total
         leax  1,x    bump pointer
back     rts   return
*********************************
* INITIALIZE
*********************************
entry    clra
         clrb
         std   flag    standard input & clear flag
         std   count    zero count
         lda   ,x    parameter character
         cmpa  #'-    end strip?
         bne   plus    no, check for plus
         dec   flag    yes, set flag
         bra   bumpit    continue
plus     cmpa  #'+    strip past offset?
         bne   chknum    no, check for count
         inc   flag    yes, set flag
bumpit   leax  1,x    bump pointer
chknum   bsr   binary    decimal count to binary
*********************************
* FIND FILENAME AND OPEN FILE
*********************************
look     lda   ,x    parameter character
         cmpa  #$2Ø    filename?
         blo   savpoint    no, standard input
         bhi   open    yes, open file
         leax  1,x    bump pointer
         bra   look    look again
open     lda   #read.    read mode
         os9   i$open    open file
         bcs   out    exit with error
         sta   path    save path number
savpoint stx   pointer    save parameter pointer
*********************************
* READ LINES FROM FILE
*********************************
read     ldy   #255    maximum line length
         leax  buffer,u    line buffer
         lda   path    input path number
         os9   i$readln    get line
         bcs   error    branch on error
*********************************
* STRIP CHARACTERS
*********************************
         ldd   count    strip spaces?
         beq   spacloop    yes, do it
         tst   flag    strip past offset?
         bgt   setend    yes, set new line end
         cmpy  count    strip entire line?
         bhi   test    no, continue
```


## BASIC UTILITY DISKETTE

A real time saver for the person who develops software using COCO Basic.

— DUMPDIR: Prints a hard copy of a disk's directory. No more searching one disk after another looking for a lost file.

— DUMPCRT: Copies text from the screen to the printer. Versions included for 40 and 80 column COCO 3 text screens.

— DUMPFILE: Dumps any disk file to the printer. Printout can be in either decimal or in hex values.

— CROSSREF: Prints cross reference of source and destination line numbers for basic jump instructions (GOTO, GOSUB, etc.).

— COMPARE: Reads two BASIC Programs from diskette and compares them line by line. Lists all lines that are not identical.

Requires COCO 2 or 3, disk and printer.
Order at $19.95 plus $2 p&h.
Calif. residents add $1.20 tax.

**T.E.M. of California**
**Box 4311**
**Fullerton, CA 92634-4311**

RAINBOW CERTIFICATION SEAL

```
         tfr   x,y   buffer address
         bra   cr    make blank line
test     tst   flag  end strip?
         bmi   endstrip  yes, keep buffer pointer
         leax  d,x   no, reset buffer pointer
endstrip tfr   y,d   length read
         subd  count  less strip count
         tst   flag  end strip?
         bpl   setend  no, continue
         decb  strip carriage return
setend   leay  d,x   end of line
cr       ldb   #$0d  carriage return
         stb   ,y    to end of line
*********************************
* OUTPUT STRIPPED LINES
*********************************
write    inca  standard output path
         ldy   #256  maximum length
         os9   i$writln  to screen
         bcc   read  continue if no error
*********************************
* ERROR CHECK AND TERMINATE
*********************************
error    cmpb  #e$eof  end of file?
         bne   out   quit with other error
         ldx   pointer  parameter pointer
         lda   ,x    parameter character
         cmpa  #$0d  another filename?
         bne   open  yes, open file
         clrb  clear error
out      os9   f$exit  quit
*********************************
* STRIP LEADING SPACES
*********************************
spacloop ldb   ,x    character
         cmpb  #$20  space to skip?
         bne   endstrip  no, display line
         leay  -1,y  decrement length
         leax  1,x   increment pointer
         bra   spacloop
*
         emod
len      equ   *
         end
```

## Listing 6: MakeStrip

```
PROCEDURE makestrip
0000    (* Generates the module "Strip" in the CMDS directory *)
0038    (* The "Attr" utility MUST be in execution direcrory *)
006F    (* or in memory for Makestrip to operate correctly *)
00A4    (* For Level I OS-9 change "/dd" in pathlists to "/d0" *)
00DD    DIM path,byt:BYTE
00E8    DIM count:INTEGER
00EF    CREATE #path,"/dd/cmds/strip":WRITE
0108    FOR count=1 TO 208
0118      READ byt
011D      PUT #path,byt
0127    NEXT count
0132    CLOSE #path
0138    SHELL "attr /dd/cmds/strip e pe"
0154    END
0156    DATA 135,205,0,208,0,13,17,129,248,0,67,2,149,83,116
0187    DATA 114,105,240,1,40,99,41,49,57,56,55,32,83,46,66
01B8    DATA 46,71,111,108,100,98,101,114,103,141,2,141,0,166
01E6    DATA 132,128,48,43,17,129,9,34,13,52,2,150,3,198,10,61
021A    DATA 235,224,215,3,48,1,57,79,95,221,0,221,2,166,132
024B    DATA 129,45,38,4,10,0,32,6,129,43,38,4,12,0,48
027C    DATA 1,141,202,166,132,129,32,37,15,34,4,48,1,32,244
02AD    DATA 134,1,16,63,132,37,78,151,1,159,4,16,142,0,255
02DE    DATA 48,70,150,1,16,63,139,37,48,220,2,39,60,13,0
030F    DATA 46,24,16,156,2,34,4,31,18,32,17,13,0,43,2
034D    DATA 48,139,31,32,147,2,13,0,42,1,90,49,139,198,13
0371    DATA 231,164,76,16,142,1,0,16,63,140,36,195,193,211,38
03A2    DATA 9,158,4,166,132,129,13,38,172,95,16,63,6,230,132
03D3    DATA 193,32,38,209,49,63,48,1,32,244,159,244,189
```


NEW

# Broke 'r Broker

by Roy C. Pierce (c) 1986

Buy & Sell your way to Power in this Exciting Stock Market Simulation.
2 - 6 Players Ages 10 & Up.
*"Not since Stock Ticker® have I had so much Fun!"* F.G. Dawson
*"Easy to Learn, Fun to Play!"* A.R. Fazackerley
128 K CoCo Required, Disk or Cassette. $23.95

## GOOD GAMES TRIO

RAINBOW CERTIFICATION SEAL

**Challenging Two Player Games** by Roy C. Pierce (c) 1988

**ADI** **OTHELLO** **CONNECT 5**
FAST AND FUN FOR ALL AGES
EASY TO RUN
ALL BASIC COMPLETELY LISTABLE $19.95

## HELLO/BAS

RAINBOW CERTIFICATION SEAL

Disk Directory Utility
(See September & October Rainbow)
*"...One Professional Looking, Well Behaved...and User Friendly Utility for BASIC Programs!"*
*"Do your Fingers a Favor and Introduce the CoCo in your Life to HELLO/BAS."* October Rainbow Review
$19.95

Prices Shown are in U.S. Funds.
Include Cheque or Money Order when Ordering.
On Orders of 2 or more Programs Deduct 10% from Total Price.
We Pay the Freight
In Canada Please Phone for Prices.
ALL Foreign Orders Add $5.00
Sorry No C.O.D.

**RCP**IERCE **SOFTWARE**

**P.O.BOX 1787,**
Main Post Office,
Edmonton, AB. Canada
T5J-2P2
**PH: (403) 474-8435**



# THE PAK IS BACK!

**Truly Compatible RS232 interface**

NEW FROM

TELEPAK Orion TECHNOLOGIES

**No compatibility hassles! Uses standard DB25 cable. No 1200 baud restriction. Baud rates to 19,200 baud! Compatible with all RSDOS and OS-9 software that uses the Radio Shack Deluxe RS232 Pack.**

PRICED TO FIT YOUR BUDGET!

**TELEPAK** $44.95
**For use with Coco 1 or multipack only, taking advantage of their built-in power supplies.**

**TELEPAK** + $49.95
**For use with ANY CoCo in any configuration.**
***Even with a Y-Cable!***

*Orion Technologies*
*P.O. Box 63196*
*Wichita, Ks. 67203*
*(316) 946-0440*

**All orders add 3.00 shpg/hdlg.**
**C.O.D. additional 3.00**
**No delay *for personal checks*.**

# Racksellers

***The retail stores listed below carry THE RAINBOW on a regular basis and may have other products of interest to Tandy Color Computer users. We suggest you patronize those in your area.***

**ALABAMA**
- Birmingham — Jefferson News Co.
- Brewton — McDowell Electronics
- Florence — Anderson News Co.
- Greenville — M & B Electronics
- Madison — Madison Books
- Montgomery — Trade 'N' Books
- Tuscaloosa — Injun John's, Inc.

**ALASKA**
- Fairbanks — Arrow Appliance/Radio Shack

**ARIZONA**
- Cottonwood — A & W Graphics Co.
- Lake Havasu City — Book Nook
- Phoenix — TRI-TEK Computers
- Tempe — Books, Etc.
  Computer Library
- Tucson — Anderson News Co.

**ARKANSAS**
- Fayetteville — Vaughn Electronics/Radio Shack
- Ft. Smith — Hot Off the Press Newsstand
- Little Rock — Anderson News Co.

**CALIFORNIA**
- Berkeley — Lyon Enterprises
- Citrus Heights — Software Plus
- Hollywood — Levity Distributors
  Stef-Jen, Inc.
- La Jolla — Butler & Mayes Booksellers
- Los Angeles — Circus of Books (2 Locations)
- Marysville — Bookland
- Napa — Bookends Bookstore
- Oakland — DeLauer's News Agency
- Rancho Murieta — Software Plus
- Sacramento — Deibert's Readerama
  Tower Magazine
- San Francisco — Booksmith
  Bookworks
  Castro Kiosk
- Santa Monica — Midnight Special Bookstore
- San Jose — Computer Literacy Bookshops
- Santa Rosa — Sawyer's News, Inc.
- Stockton — Harding Way News
  Paperbacks Unlimited
- Sunnyvale — Computer Literacy
- Torrance — El Camino College Bookstore

**COLORADO**
- Aurora — Aurora Newsstand
- Colorado Springs — Hathaway's
- Denver — News Gallery
- Glenwood Springs — The Book Train
- Grand Junction — Readmore Book & Magazine
- Longmont — City Newsstand

**DELAWARE**
- Middletown — Delmar Co.
- Newark — Newark Newsstand
- Wilmington — Normar, Inc.—The Smoke Shop

**DISTRICT OF COLUMBIA**
- Washington, DC — Chronichles
  News Room
  World News, Inc.

**FLORIDA**
- Boca Raton — Great American Book Co.
- Clearwater — The Avid Reader
- Cocoa — The Open Door
- Dania — Dania News & Books
- Davie — Software Plus More
- Ft. Lauderdale — Bob's News & Book-Store
  Clarks Out of Town News
  Mike's Electronics Distributor
- Gainesville — Paper Chase
- Jacksonville — Book Co.
- North Miami Beach — Almar Bookstore
- Panama City — Boyd-Ebert Corp.
- Pensacola — Anderson News Co.
- Pinellas Park — Wolf's Newsstand
- South Pasadena — Poling Place Bookstore
- Starke — Record Junction, Inc.
  Radio Shack Dealer
- Sunrise — Sunny's at Sunset
- Tallahassee — Anderson News Co.
  DuBey's News Center
- Titusville — Computrac

**GEORGIA**
- Atlanta — Border's
- Bremen — Bremen Electronics/Radio Shack
- Forest Park — Ellers News Center
- Jesup — Radio Shack
- Thomasville — Smokehouse Newsstand
- Toccoa — Martin Music Radio Shack

**IDAHO**
- Boise — Book Shelf, Inc.
- Moscow — Johnson News Agency

**ILLINOIS**
- Belleville — Software or Systems
- Champaign — Bookmark
- Chicago — B. Dalton Booksellers
- Decatur — Book Emporium
  K-Mart Plaza
  Northgate Mall
- East Moline — Book Emporium
- Evanston — Norris Center Bookstore
- Kewanee — Book Emporium
- Lisle — Book Nook
- Lombard — Empire Periodicals
- Newton — Bill's TV Radio Shack
- Paris — Book Emporium
- Peoria — Book Emporium
  Sheridan Village
  Westlake Shopping Center
  Illinois News Service
- Springfield — Book Emporium
  Sangamon Center North
  Town & Country Shopping Ctr.
- Sunnyland — Book Emporium
- West Frankfort — Paper Place
- Wheeling — North Shore Distributors

**INDIANA**
- Angola — D & D Electronics
  Radio Shack
- Berne — White Cottage Electronics
- Bloomington — Book Corner
- Columbus — Micro Computer Systems, Inc.
- Crawfordsville — Koch's Books
- Dyer — Miles Books
- Franklin — Gallery Book Shop
- Ft. Wayne — Michiana News Service
- Garrett — Finn News Agency, Inc.
- Indianapolis — Bookland, Inc.
  Borders Bookshop
  Indiana News
  Southside News
- Lebanon — Gallery Book Shop
- Martinsville — Radio Shack
- Richmond — Voyles News Agency, Inc.
- Wabash — Mitting's Electronics

**IOWA**
- Davenport — Interstate Book Store
- Des Moines — Thackery's Books, Inc.
- Fairfield — Kramers Books & Gifts

**KANSAS**
- Hutchinson — Crossroads, Inc.
- Topeka — Palmer News, Inc.
  Town Crier of Topeka, Inc.
- Wellington — Dandy's/Radio Shack Dealer
- Wichita — Lloyd's Radio

**KENTUCKY**
- Hazard — Daniel Boone Gulf Mart
- Henderson — Matt's News & Gifts
- Hopkinsville — Hobby Shop
- Louisville — Hawley-Cooke Booksellers (2 Locations)
- Middletown — Software City
- Paducah — Radio Shack

**LOUISIANA**
- Baton Rouge — City News Stand
- Lockport — TV Doctor/Radio Shack
- New Orleans — Sidney's News Stand Uptown
- Monroe — The Book Rack

**MAINE**
- Bangor — Magazines, Inc.
- Brockton — Voyager Bookstore
- Caribou — Radio Shack
- Oxford — Books-N-Things
- Sanford — Radio Shack

**MARYLAND**
- College Park — University Bookstore

**MASSACHUSETTS**
- Boston — Eastern Newsstand
- Brockton — Voyager Bookstore
- Cambridge — Out Of Town News
- Ipswich — Ipswich News

**MASSACHUSETTS (cont'd)**
- Littleton — Computer Plus
- Lynn — North Shore News Co.
- Swansea — Newsbreak, Inc.

**MICHIGAN**
- Allen Park — Book Nook, Inc.
- Birmingham — Border's Book Shop
- Durand — Robbins Electronics
- E. Detroit — Merit Book Center
- Hillsdale — Electronics Express/Radio Shack
- Holland — Fris News Company
- Kalamazoo — The Book Raft
- Lowell — Lowell Electronics
- Muskegon — The Eight Bit Corner
- Niles — Michiana News Service
- Perry — Perry Computers
- Riverview — Riverview Book Store
- Roseville — New Horizons Book Shop

**MINNESOTA**
- Burnsville — Shinder's Burnsville
- Crystal — Shinder's Crystal Gallery
- Edina — Shinder's Leisure Lane
- Minneapolis — Shinder's (2 Locations)
- Minnetonka — Shinder's Ridge Square
- Roseville — Shinder's Roseville
- St. Paul — Shinder's Annex
  Shinder's Maplewood
  Shinder's St. Pauls
- Willmar — The Photo Shop

**MISSOURI**
- Farmington — Ray's TV & Radio Shack
- Flat River — Ray's TV & Radio Shack
- Florissant — Book Brokers Unlimited
- Jefferson City — Cowley Distributing
- Kirksville — T&R Electronics
- St. Louis — Book Emporium

**MONTANA**
- Butte — Plaza Books

**NEBRASKA**
- Lincoln — Nebraska Bookstore
- Omaha — Nelson News

**NEVADA**
- Carson City — Bookcellar
- Las Vegas — Hurley Electronics
  Steve's Books & Magazines

**NEW HAMPSHIRE**
- Keene — Radio Shack Associate Store
- Manchester — Bookwrights
- West Lebanon — Verham News Corp.

**NEW JERSEY**
- Atlantic City — Atlantic City News Agency
- Cedar Knolls — Village Computer & Software
- Clinton — Micro World II
- Pennsville — Dave's Elect. Radio Shack
- Rockaway — Software Station

**NEW MEXICO**
- Alamogordo — New Horizons Computer Systems
- Albuquerque — Page One Newsstand
- Santa Fe — Downtown Subscription

**NEW YORK**
- Amherst — Village Green-Buffalo Books
- Brockport — Lift Bridge Book Shop, Inc.
- Brooklyn — Cromland, Inc.
- Elmira Heights — Southern Tier News Co., Inc.
- Fredonia — On Line: Computer Access Center
- Hudson Falls — G.A. West & Co.
- Huntington — Oscar's Bookshop
- Johnson City — Unicorn Electronics
- New York — Barnes & Noble—Sales Annex
  Coliseum Books
  Eastern Newsstand
  Grand Central Station, Track 37
  200 Park Ave., (Pan Am #1)
  55 Water Street
  World Trade Center #2
  First Stop News
  Idle Hours Bookstore
  International Smoke Shop
  Jonil Smoke
  Penn Book
  Software City
  State News
  Walden Books
  World Wide Media Services
- Pawling — Universal Computer Service
- Rochester — Village Green
  World Wide News

**NORTH CAROLINA**

| | |
|---|---|
| Cary | News Center in Cary Village |
| Chapel Hill | University News & Sundry |
| Charlotte | Newsstand Int'l |
| Hickory | $C^2$ Books & Comics |
| Jacksonville | Michele's, Inc. |
| Kernersville | K & S Newsstand |
| Marion | Boomers Rhythm Center |
| Winston-Salem | K & S Newsstand (3 Locations) |
| | Rainbow News Ltd. |

**OHIO**

| | |
|---|---|
| Akron | Churchill News & Tobacco |
| Canton | Little Professor Book Center |
| Chardon | Thrasher Radio & TV |
| Cincinnati | Cinsoft |
| Cleveland | Erieview News |
| Columbiana | Fidelity Sound & Electronics |
| Columbus | B5 Software |
| | Micro Center |
| | The Newsstand |
| Dayton | Books & Co. |
| | Huber Heights Book & Card |
| | Wilke News |
| | Wright News & Books |
| Dublin | Book Barn |
| Fairborn | News-Readers |
| | Wilke's University Shoppe |
| Findlay | Open Book |
| Kent | The News Shop |
| Lakewood | Lakewood International News |
| Lima | Edu-Caterers |
| Miamisburg | Wilke News |
| Parma | Bookmark Newscenter |
| Toledo | Leo's Book & Wine Shop |
| Warren | Book Nook, Inc. |
| Xenia | Fine Print Books |
| Youngstown | Plaza Book & Smoke Shop |

**OKLAHOMA**

| | |
|---|---|
| Oklahoma City | Merit Micro Software |
| Tahlequah | Thomas Sales, Inc. dba Radio Shack |
| Tulsa | Steve's Book Store |

**OREGON**

| | |
|---|---|
| Eugene | Libra Books — Book Mark |
| Portland | Fifth Avenue News |
| | Rich Cigar Store, Inc. |
| | Sixth & Washington News |
| Salem | Capitol News Center |
| | Checkmate Book |

**PENNSYLVANIA**

| | |
|---|---|
| Allentown | Owl Services |
| Altoona | Newborn Enterprises |
| Bryn Mawr | Bryn Mawr News |
| Corry | Corry Books & Cards |
| Feasterville | Global Books |
| King of Prussia | Gene's Books |
| Malvern | Personal Software |
| Reading | Smith's News & Card Center |
| Temple | Software Corner |
| West Chester | Chester County Book Co. |
| Wind Gap | Micro World |
| York | The Computer Center of York |
| | Tollgate Bookstore |

**RHODE ISLAND**

| | |
|---|---|
| Newport | Bellevue News |

**SOUTH CAROLINA**

| | |
|---|---|
| Charleston Hts. | Software Haus, Inc. |
| Clemson | Clemson Newsstand |
| Florence | Ray's #1 |
| Greenville | Palmetto News Co. |
| Spartanburg | Software City |

**TENNESSEE**

| | |
|---|---|
| Brentwood | Bookworld #5 |
| Chattanooga | Anderson News Co. |
| | Guild Books & Periodicals |
| Dickson | Highland Electronics |
| Knoxville | Anderson News Co. |
| | Davis-Kidd Bookseller |
| Memphis | Computer Center |
| Nashville | Davis-Kidd Booksellers |
| | Misko's Place |
| | R.M. Mills Bookstore |
| Smyrna | Delker Electronics |

**TEXAS**

| | |
|---|---|
| Big Spring | Poncho's News |
| Desoto | Maxwell Books |
| Elgin | The Homing Pigeon |
| Ft. Worth | Trinity News |
| Harlington | Book Mark |

**UTAH**

| | |
|---|---|
| Provo | Valley Book Center |

**VIRGINIA**

| | |
|---|---|
| Danville | K & S Newsstand |
| Hampton | Benders |
| Lynchburg | Self Serve Software |
| Norfolk | I-O Computers |
| | Turn The Page |
| Richmond | Volume I Bookstore |

**WASHINGTON**

| | |
|---|---|
| Port Angeles | Port Book & News |
| Seattle | Adams News Co., Inc. |
| | Bulldog News |
| Tacoma | B & I Magazines & Books |
| | Nybbles 'N Bytes |

**WEST VIRGINIA**

| | |
|---|---|
| Huntington | Nick's News |
| Logan | Stan's Electronics & Radio Shack |
| Madison | Communications, LTD |
| Parkersburg | Valley News Service |
| South Charleston | Spring Hill News |

**WISCONSIN**

| | |
|---|---|
| Appleton | Badger Periodicals |
| Cudahy | Cudahy News & Hobby |
| Kenosha | R.K. News, Inc. |
| Madison | Pic A Book |
| | University Bookstore |
| Milwaukee | Juneau Village Reader |
| Waukesha | Holt Variety |

**ARGENTINA**

| | |
|---|---|
| Cordoba | Information Telecommunicationes |

**AUSTRALIA**

| | |
|---|---|
| Blaxland | Blaxland Computers |
| Kingsford | Paris Radio Electronics |

**CANADA:**

**ALBERTA**

| | |
|---|---|
| Banff | Banff Radio Shack |
| Bonnyville | Paul Tercier |
| Brooks | Double "D" A.S.C. Radio Shack |
| Calgary | Billy's News |
| Claresholm | Radio Shack Associated Stores |
| Drayton Valley | Langard Electronics |
| Edmonton | CMD Micro |
| Edson | Radio Shack, asd |
| Fairview | D.N.R. Furniture & TV |
| Fox Creek | Fox City Color & Sound |
| | A.S.C. Radio Shack |
| Ft. Saskatchewan | Ft. Mall Radio Shack, ASC |
| Grande Cache | The Stereo Hut |
| Grande Centre | The Book Nook |
| Hinton | Jim Cooper |
| Innisfail | L & S Stereo |
| Lecombe | Brian's Electronics |
| Leduc | Radio Shack Associated Stores |
| Lethbridge | Datatron |
| Lloydminster | Lloyd Radio Shack |
| Okotoks | Okotoks Radio Shack |
| Peace River | Radio Shack Associated Stores |
| | Tavener Software |
| St. Paul | Walter's Electronics |
| Stettler | Stettler Radio Shack |
| Strathmore | Wheatland Electronics |
| Taber | Pynewood Sight & Sound |
| Westlock | Westlock Stereo |
| Wetaskiwin | Radio Shack |

**BRITISH COLUMBIA**

| | |
|---|---|
| Burnaby | Compulit |
| Burns Lake | VT. Video Works |
| Campbell River | TRS Electronics |
| Chilliwack | Charles Parker |

**BRITISH COLUMBIA (cont'd)**

| | |
|---|---|
| Coquitlam | Cody Books LTD |
| Coortenay | Rick's Music & Stereo |
| Dawson Creek | Bell Radio & TV |
| Golden | Taks Home Furnishings |
| Kelowna | Telesoft Marketing |
| Langley | Langley Radio Shack |
| Nelson | Oliver's Books |
| New Westminster | Cody Books LTD |
| Parksville | Parksville TV |
| Penticton | D.J.'s |
| | Four Corner Grocery |
| Sidney | Sidney Electronics |
| Smithers | Wall's Home Furniture |
| Squamish | Kotyk Electronics |
| Vancouver | Active Components |
| | Friendlyware Computers |
| | Granville Book Co. |
| | Siliconnections Books LTD |
| 100 Mile House | Tip Top Radio & TV |

**MANITOBA**

| | |
|---|---|
| Altona | L.A. Wiebr Ltd. |
| Lundar | Goranson Elec. |
| Morden | Central Sound |
| The Pas | Jodi's Sight & Sound |
| Selkirk | G.L. Enns Elec. |
| Virden | Archer Enterprises |
| Winnipeg | J & J Electronics Ltd. |

**NEW BRUNSWICK**

| | |
|---|---|
| Moncton | Jeffries Enterprises |
| Sussex | Dewitt Elec. |

**NEWFOUNDLAND**

| | |
|---|---|
| Botwood | Seaport Elec. |
| Carbonear | Slade Realties |

**NOVA SCOTIA**

| | |
|---|---|
| Halifax | Atlantic News |

**ONTARIO**

| | |
|---|---|
| Angus | Micro Computer Services |
| Aurora | Compu Vision |
| Concord | Ingram Software |
| Exceter | J. Macleane & Sons |
| Hanover | Modern Appliance Centre |
| Huntsville | Huntsville Elec. |
| Kenora | Donny "B" |
| Kingston | T.M. Computers |
| Listowel | Modern Appliance Centre |
| South River | Max TV |
| | Dennis TV |
| Toronto | Gordon and Gotch |

**QUEBEC**

| | |
|---|---|
| LaSalle | Messageries de Presse Benjamin Enr. |
| Pont. Rouge | Boutique Bruno Laroche |

**SASKATCHEWAN**

| | |
|---|---|
| Assiniboia | Telstar News |
| Estevan | Kotyk Electronics |
| Moose Jaw | D&S Computer Place |
| Nipiwan | Cornerstone Sound |
| Regina | Regina CoCo Club |
| | Software Supermarket |
| Saskatoon | Everybody's Software Library |
| Shellbrooke | Gec. Laberge Radio Shack |
| Tisdale | Paul's Service |
| Unity | Grant's House of Sound |

**YUKON**

| | |
|---|---|
| Whitehorse | H & O Holdings |

**JAPAN**

| | |
|---|---|
| Tokyo | America Ado, Inc. |

**PUERTO RICO**

| | |
|---|---|
| San Juan | Software City |

*Also available at all B. Dalton Booksellers, and selected Coles and W.H. Smith in Canada, Waldenbooks, Pickwick Books, Encore Books, Barnes & Noble, Little Professors, Tower Book & Records, Kroch's & Brentano's, and Community Newscenters.*

# Advertisers Index

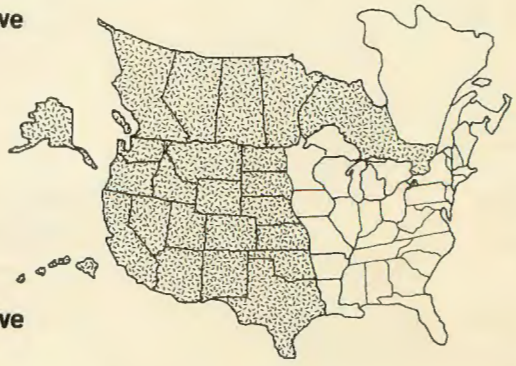
***We encourage you to patronize our advertisers — all of whom support the Tandy Color Computer. We will appreciate your mentioning* THE RAINBOW *when you contact these firms.***


4-TECHS .....175
Adventure Novel Software .....67
After-Five Software .....173
Alpha Products .....21
Alpha Software Technologies ...81
Alpha-Biotechnologies Inc. .....37
Arizona Small Computer Company .....105
Ark Royal Games .....141
Burke & Burke .....35, 81
Cer-Comp .....154, 155
Cinsoft .....159
CoCo Connection .....153
Codis Enterprises .....107
Cognitec .....29
Colorware .....18, 19
Computer Center .....169
Computer Island .....87
Computer Plus .....3
CRC/Disto .....115
CY-BURNET-ICS .....89
D.P. Johnson .....165
DATAMATCH, INC. .....55
Dayton Associates of W. R. Hall, Inc. .....132, 133
Delphi .....34, 35
Diecom Products .....IFC
Dorsett Educational Systems. . .119
Dr. Preble's Programs .....IBC
E-Z Friendly Software .....39
Eversoft .....159
Frank Hogg Laboratory ...186, 187
Game Point Software .....131
Gimmesoft .....100, 101
Granite Computer Systems ....175
GSW Software .....105
Hard Drive Specialist .....171
Hawkes Research Services .....141
HawkSoft, Inc. .....99
*HJL Products* .....109
Howard Medical .....66, 194
J & R Electronics .....170
JR & JR Softstuff .....67
Kenneth Leigh Enterprises .....135
Metric Industries .....14
Michtron .....BC
Micro Works, The .....121
Microcom Software 9, 11, 13, 15, 17
Microtech Consultants Inc. .....31
MicroWorld .....65
Orion Technologies .....189
Owl-Ware .....69, 70, 71
Performance Peripherals .....137
Perry Computers .....113
Public Domain Software .....170
PXE Computing .....7
R.C. Pierce Software .....189
Rainbow Adventures Book IV ...24
Rainbow Binder .....10
Rainbow Bookshelf .....50, 51
Rainbow Gift Subscription .....112
Rainbow on Tape and Disk .....12
Renco Computer Supplies .....107
Rulaford Research .....85
Saint John Gallery .....89
SD Enterprises ...25, 147, 149, 151, 153
Second City Software .....193
SpectroSystems .....39
SPORTSWARE .....158
Sugar Software .....181
Sundog Systems .....61
T & D Software .....22, 23, 57, 125
T.E.M. of California .....188
Tandy/Radio Shack .....20, 117
Tepco .....177
Three C's Projects .....149
Tomela & Co. .....158
Tothian Software .....131
True Data Products .....78, 79
Vidicom Corporation .....37
Woodstown Electronics .....147
Zebra Systems .....63



☒ **Call:**
**Belinda Kirby**
**Advertising Representative**
The Falsoft Building
9509 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059
**(502) 228-4497**

☐ **Call:**
**Kim Vincent**
**Advertising Representative**
The Falsoft Building
9509 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059
**(502) 228-4492**



MasterCard VISA C.O.D. CHECKS ORDER

# Second City Software

P.O. Box 72956
Roselle, IL 60172
Voice: 312-653-5610
BBS: 312-307-1519

CoCo CALENDER:
Organize all of your appointments with this 365 day CoCo Calender. 64k DISK.....$9.95

BLACKJACK ROYALE:
Even your casino odds with this BlackJack card simulation and tutor! Program can be edited for different house rules. 64k DISK.....$16.95

BSE - BASIC SCREEN EDITOR:
Gives Basic a full-screen editor to supplement the regular EDIT commands. Works on the CoCo 1&2 and with the CoCo 3, WIDTH 32, 40 or 80 is supported! Complete screen cursor control with the arrow keys plus features to make EDITing Basic programs a snap! BSE, a must have CoCo utility. Our low price was the only corner that was cut on this quality program. 64k DISK.....$19.95

CHECK-09MV:
Finally, a program that interacts with MultiVue for FAST and EASY check balancing. CHECK-09MV and you can now take control of your bank checking account. No more waiting on your bank statement for an ending balance. CHECK-09MV will provide a check-by-check balance in an easy to use format that eliminates those monthly surprizes! Bring your money and you closer together and have the buck STOP HERE! 512k DISK.....$22.95

CoCoMAX II: By Colorware
The 'CLASSIC' CoCo graphic program. Draw great works of art with the program that set a standard for all others to follow. Supported by a Hi-Res interface and numerous printer drivers for complete set-up. 64k DISK.....$78.45

CoCoMAX III: By Colorware
All new program based off the 'CLASSIC' CoCo-Max II software. Allows for full animation, select 16 colors from a 64 color palette, fast & easy to use w/ pull down menus in a point-and-click environment. 128k or 512k DISK.....$78.45

DISK UTILITY 2.1A PLUS:
A complete disk utility package for all CoCo's. Full Disk I/O for FORMAT, COPY, and BACKUP. Supports single or double sided 35 or 40 track drives. With DISK UTILITY 2.1A PLUS from SCS, you get TWO programs for ONE low price. DISK UTILITY for the CoCo 1 & 2 and DISK UTILITY for the CoCo 3. Find it anywhere in this magazine for less and we'll cut a fi...
64k DISK.....$23.95

**HOLIDAY SPECIAL**
With every order you place with Second City Software during the months of November and December, you will receive a **FREE GIFT!**

This offer expires December 31, 1988. The average retail price of the offered free gifts is $12.00.

TELEPATCH:
Turn Telewriter 64 into the best Word Processor for the CoCo 1&2! TELEPATCH is compatible with all CoCo's. Comes with complete documentations for easy upgrading and changes.
64k DISK.....$24.95

SCHEMATIC DRAFTING PROCESSOR:
A 'FAST' and 'EASY TO USE' ELECTRONIC DRAFTING PROCESSOR. Create pro-looking diagrams using a 480x540 pixel screen with 6 viewing windows! Over '30' electronic symbols with 10 definable symbols. Even supports Logic gates & Multipin chips! Print hardcopy or save to disk for later editing. 64k DISK.....$22.95

OS-9 SOLUTION:
Tame the hostile environment of OS-9 with OS-9 SOLUTION! Replaces 20 of the command calls with single keystroke, menu driven commands. No more long and complex pathnames or syntaxes to remember! Works with either OS-9 Level One or Two.....$24.95

TAPE/DISK UTILITY:
A utility package that transfers TAPE to DISK or DISK to TAPE automatically. If you just got your first disk drive, TAPE/DISK is a MUST HAVE program. Will print tape & disk directories to any supported printer. 64k DISK....$19.95

FAST DUPE 2:
Backup & Format as many copies of your original disk that you need. FAST DUPE 2 reads source into memory for fast and realible transfer. Supports 4 drives. 64k DISK.....$19.95

DISCOUNT SOFTWARE By ColorVenture
RAM DISK LIGHTNING DISK.....$16.95
PRINTER LIGHTNING.....$16.95
BACKUP LIGHTNING.....$16.95
BUY ALL THREE FOR ONLY.....$42.95

HI-RES JOYSTICK DRIVER.....$19.95
MAX PATCH.....$19.95
BUY BOTH FOR ONLY.....$34.95

---

HGRXDUMP:
Produce hardcopy graphic files with your DMP105 or DMP130 printer. CoCo 1, 2 & 3 compatible. 64k DISK.....$19.95

CoCo KEYBOARD:
Program allows the user to utilize the function keys on the HJL-57 Pro-fessional, Deluxe CoCo, & Micronix keyboard.
32k DISK.....$6.95

SECOND CITY SOFTWARE
Accepts MasterCard, Visa, C.O.D. and Check orders. Please add $2.50 for shipping ($4.50 for Canada orders) & allow 1 to 3 weeks for delivery. C.O.D. orders, add an additional $2.50.

MY DOS: By Chris Hawks
Supports accesses to double sided drives, able to use the J&M Controller with the CoCo 3, DIR commands simplified and a host of other special features. 64k DISK.....$14.95

SCS DOS:
Add 24 new disk commands with 2 Hi-Res Screens! Supports 40 track & Double Sided drives, 6ms stepping, auto disk search, error trapping and burnable into an EPROM. 64k DISK.....$24.95

A-DOS 3:
The popular Disk Operating System from SpectroSystems for the CoCo 3. 128k DISK.....$34.95

---

SCS can custom 'burn' your purchased DOS program for only $15.00! This includes the price of the EPROM chip and the BURN charge. Call or write for details.

VIP LIBRARY:
This popular 'intergraded' package includes, VIP Writer, Terminal, Data Base, Calc and Disk Zap which can fix a diskette with I/O errors. SCS special price. 64k DISK.....$125.00

VIP WRITER III w/SPELL CHECKER...$79.95
VIP DATABASE III.....$69.95

TELEWRITER - 128.....$76.95

THE NEWSPAPER PLUS:
DeskTop Publishing for the CoCo 3? With the ALL NEW NEWSPAPER PLUS, you now can create complete and sophisticated Banners, Headlines along with Text Columns and Graphics. THE NEWSPAPER PLUS allows for importing different pictures, fonts and fill patterns from disk for that pro-look. Comes complete with 22 fonts and 50 clip art pictures. THE NEWSPAPER PLUS is an all new upgraded program based on the original NEWSPAPER program. SCS is the ONLY company authorized to handle THE NEWSPAPER PLUS program. Why buy the old, overpriced and outdated program when you can get the newest release for less!
128k DISK.....$48.95

THE NEWSPAPER GRAPHICS DISK I:
The FIRST OFFICIAL supplementary program disk for THE NEWSPAPER. Contains '50' NEW PICTURE FILES, '10' NEW FILL PATTERNS and '3' ADDITIONAL FONT SETS! GRAPHICS DISK I is available only from Second City Software for $19.95

NEW FROM SECOND CITY SOFTWARE

MAX-10: By Colorware
The 'Dazzling Word Processor & Document Creator for the CoCo3'. You asked for it and now it is available at an SCS special price.
128k DISK.....$78.45

# HOWARD MEDICAL COMPUTERS

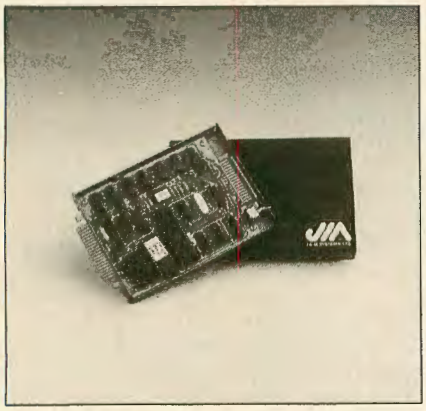
1690 N. Elston • Chicago, IL 60622 • ORDERS (800) 443-1444 • INQUIRIES AND ORDER STATUS (312) 278-1440

★ 5 STAR FINAL NOVEMBER '88 RAINY

# HD-1 Sale Extended

## DC-5 CONTROLLER

from Hard Drive Specialist gives great Radio Shack compatability and double sided access to DSDD Drives like Howard's DD-3. Two ROM sockets, one 24 pin and one 28 pin allows use of RS 1.1 ROM by jumper selection. Gold plated contacts reduce I/O Errors. **$75** ($2 Shipping)



## RS DOS ROM CHIP

ROM chip fits inside disk controller. 24 pin fits both J&M and RS controller Release 1.1. For CoCo 3 Compatibility. **$25** each Reg. $40 ($2 shipping)

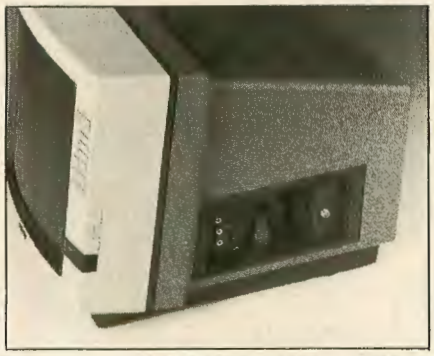
**NEW FROM DISTO $129** DC6 ($2 Shipping) Super Controller II works with CoCo 1, 2 & 3. It buffers keyboard input so that no keystrokes are lost when disk is reading or writing. Especially useful with OS-9, but also works with BASIC.

## *MONITOR*

**Sony KV-1311CR $499**

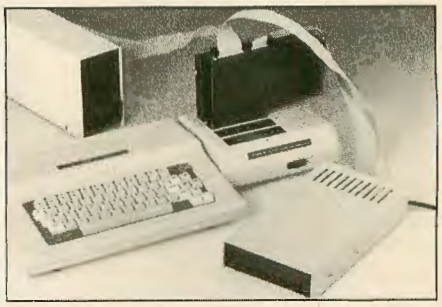
Regular $625 ($15 shipping)

• Vivid Color • Vertically flat 13" screen • Monitor/Trinitron TV with remote control • 640 × 240 resolution at 15MHZ .37 mm Dot pitch • RGB analog & digital; TTL; and composite inputs • VCR inputs • Cable to CoCo 3 $36



## HARD DRIVE ACCESSORIES

**3' Hard Drive Cable $20**
**Clock Upgrade $20**
**Burke & Burke Interface**
**RSB $39.95**
**TEAC 55B $118**
**Hard Drive ROM Boot $20**



## Hard Drive—Ready to Run!

20,000,000 Bytes or the equivalent to a 125 R.S. 501's on line are packed into this hard drive, pre installed and ready to run. All you need to do is plug it in and go! This complete easy to use package includes a Seagate 20 Meg Hard Drive, a Western Digital WD 1002-WX 1 Controller and interface* that plugs into slot #3 of multipack interface, plus the case & power supply. You even get a 1 year warranty. This 20 meg Hard Drive will work with IBM & clone. Basic driver, $29.95, lets you access this hard drive without need for OS-9.

**HD-1** **$499**

*** Burke & Burke** ($9 Shipping)

**Sale ends Nov. 15**

## PAL UPGRADE FOR MULTI-PAK

specify for 26-3024 or 26-3124

**14.95** ($2 ship)

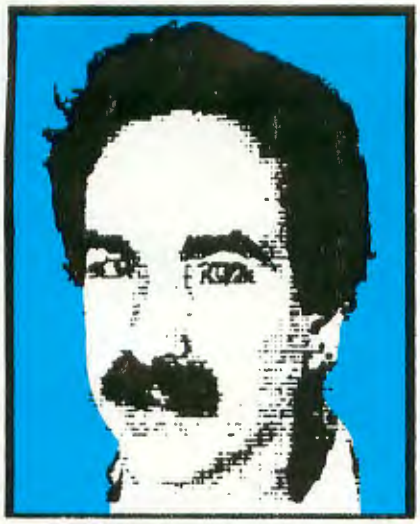
**DON'T MISS OUT, ORDER TODAY!**

**800 / 443-1444**

WE ACCEPT VISA • MASTERCARD • AMERICAN EXPRESS • C.O.D. OR CHECKS • SCHOOL P.O.
**NEW — DISCOVER CARD**

## "Guarantee" As good as Gold.

Howard Medical's 30-day guarantee is meant to eliminate the uncertainty of dealing with a company through the mail. Once you receive our hardware, try it out; test it for compatibility. If you're not happy with it for any reason, return it in 30 days and we'll give you your money back (less shipping.) Shipping charges are for 48 states. APO, Canada and Puerto Rico orders are higher.



# Dr. Preble's Programs

**For Color Computer Software Since 1983**

## Dear Friends,

Thank you. 1988 marks our fifth year of providing quality software for the Color computer. Only your support has made it possible. So, from our hearts, Peg and I thank you And remember our promise--If you buy it from us, we support it If you are unhappy for any reason, send it back for a full refund within 30 days of purchase.

## Pyramix

This facinating CoCo 3 game continues to be one of our best sellers. Pyramix is 100% machine language written exclusively to take advantage of all the power in your 128K CoCo 3. The Colors are brilliant, the graphics sharp, the action fast Written by Jordon Tsvetkoff and a product of Color-Venture.

## The Freedom Series

### Vocal Freedom

I've got to admit, this is one nifty computer program. Vocal Freedom turns your computer into a digital voice or sound recorder. The optional **Hacker's Pac** lets you incorporate voices or sounds that you record into your own BASIC or ML programs. This is not a synthesizer. Sounds are digitized directly into computer memory so that voices or sound effects sound very natural. One "off-the-shelf" application for Vocal Freedom is an automatic message-minder. Record a message for your family into memory. Set Vocal Freedom on automatic. When Vocal Freedom "hears" any noise in the room, it plays the pre-recorded message! Disk operations are supported. VF also tests memory to take advantage of from 64K up to a full 512K. Requires low cost amplifiler (RS cat. #277-1008) and any microphone.

### Mental Freedom

Would your friends be impressed if your computer could read their minds? Mental Freedom uses the techniques of Biofeedback to control video game action on the screen. Telekinesis? Yes, you control the action with your thoughts and emotions. And, oh yes, it talks in a perfectly natural voice without using a speech synthesizer! Requires Radio Shack's low cost Biofeedback monitor, Cat. #63-675

## BASIC Freedom

Do you ever type in BASIC programs--manually, I mean. If you do, you know it can be a real chore. Basic Freedom changes all that It gives you a full screen editor just like a word processor, but for BASIC programs. Once loaded in, it is always on-line. It hides invisibly until you call it forth with a single keypress! This program is a must for programers or anyone who types in programs. By Chris Babcock and a product of Color-Venture.

## Lightning Series

These three utilities give real power to your CoCo 3.

### Ramdisk Lightning

This is the best Ramdisk available. It lets you have up to 4 mechanical disk drives and 2 Ram drives on-line and is fully compatible with our printer spooler below.

### Printer Lightning

Load it and forget it--except for the versatility it gives you. Never wait for your printer again! Printer runs at high speed while you continue to work at the keyboard!

### Backup Lightning

This utility requires 512K. Reads your master disk once and then makes superfast multiple disk backups on all your dirves! No need to format blank disks first! Supports 35, 40 or 80 track drives.

## Prices

### CoCo 3 only

| | |
|---|---|
| Ram Disk Lightning Disk | $19.95 |
| Printer Lightning Disk | $19.95 |
| Backup Lightning Disk | $19.95 |
| All three, Disk | $49.95 |
| Pyramix, Disk | $24.95 |

### CoCo 1,2, or 3

| | |
|---|---|
| Vocal Freedom, Disk | $34.95 |
| Vocal Freedom Hackers Pac | $14.95 |

### CoCo 2 or 3 only

| | |
|---|---|
| Mental Freedom, Disk | $24.95 |
| Basic Freedom, Disk | $24.95 |

### CoCo 1 or 2 only

| | |
|---|---|
| VDOS, The Undisk, ramdisk for the CoCo 1 or 2 only, Tape | $24.95 |
| VDUMP, backup Undisk files to single tape file, Tape | $14 95 |
| VPRINT, Print Undisk directory, Tape | $9.95 |

### Everyone

**Add $2.50 shipping/handling in USA or CANADA**

**Add $5.00 to ship to other countries**


**Dr. Preble's Programs**
**6540 Outer Loop**
**Louisville, KY 40228**
**24 Hour Hot Line**
**(502) 969-1818**


**Visa, MC, COD, Check**

# Speed Racer

As the checkered flag drops your pulse rises in this lively arcade game. The road twists to the horizon on the 3-D panorama that sets the stage for exciting racing. Vie for time as you glide through the curves at incredible speeds. Step through the gears to stay ahead of the pack, but be quick! Some will stop at nothing to see the end of the race, or the end of you! Four challenging raceways, complete with obstacles and colorful 3-D scenery test your skills in this Pole Position™ type game.

32K Color Computer required...$34.95

# Pinball Factory

Video games come full circle in this tribute to the original arcade game, *Pinball*. Classic pinball springs to life as never before, with fresh new angles that only a computer can offer. Crisp graphics, sound, and fast smooth action give this machine-language arcade game a realistic, responsive feel you'll hardly believe. There are even "tilt" buttons that let you "bump" the machine. In addition to playing a great game of pinball, you can enjoy hours of creative pleasure as you design, build, edit, and play your own screens.

64K Color Computer required...$34.95

# Demon Seed

The first waves of flying, diving, bloodthirsty bats are arriving. Move, fire, and move again. It's a never ending battle. If you are lucky enough to defeat the bats, be ready for a much greater challenge, The *Evil Demons* themselves. Destroy a wing and another takes its place. Only a direct hit can save you now. It will take great skill to triumph. If you do, then you better be ready for the *End*. The Demon Flag Ship descends to destroy your remaining ships. Your only hope is to penetrate the hull, break through the shield, and destroy the dreaded Gargoyle.

32K Color Computer required...$19.95

MICHTRON is always looking for programmers and programs. If you are interested in working with one of the most respected company's in the computer software field please give us a call.

MichTron®

For more information
on these or other fine products
call our knowledgeable staff!

576 S. Telegraph
Pontiac, MI 48053
(313) 334-5700

Dealer inquiries welcome.
Visa and Mastercard accepted.